THE PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XXXIV.

Nulla recordanti lux est ingrata.—MARTIAL.

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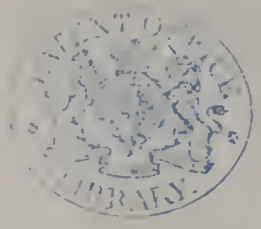

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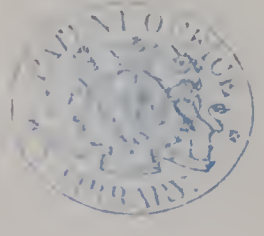

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1635.—*January* 3, 1890.

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PROSPECTIVE AND RETROSPECTIVE.

THE Jubilee Year of Photography just closed has furnished occasion for taking note of the progress of our Art-Science in its many phases and applications; the Congresses of London, Paris, and Berlin have each dealt with it in turn, and yet the subject is far from being exhausted. The reports show steady advances all round, with vastly increased number of votaries and new resources in the way of materials and apparatus. The practice of photography has now become so much simplified, that hosts of recruits have been attracted to us, many of whom may eventually be induced to pursue their studies in a more scientific or artistic spirit than that which served as the first motive in taking up the camera. Scarcely any public event now escapes being recorded, and where no camera is seen, it is not safe to assume that the photographer is not secretly working amongst us. Cumbrous apparatus is all but banished in favour of smaller appliances for producing negatives of the required delicacy, which can afterwards be enlarged. Weighty glass is giving way to light celluloid films, and bulky carriers to roller-slides, so that pedestrians and cyclists no longer hesitate to carry the needful outfit amongst their impedimenta, and they find dark-room accommodation provided for them at many points along their route.

To keep pace with the growing demands—commercial and otherwise—the London Chamber of Commerce has added a photographic section, which may be expected to deal with questions of piracy and commercial immorality, standards of weights and measures, and, what is equally important, provide the machinery for referring to arbitration all sorts of matters in dispute. It may eventually undertake the testing of lenses and chemical products, stamping them as with a hall mark when approved.

The notable increase in the number of amateur clubs and local societies, with discussions and proceedings calling for review or report, made it imperative to increase the size of the NEWS, and in the month of October it was expanded from sixteen to twenty pages. Advantage was taken of this change to introduce new paper and type, more attention being paid also to the quality of the pictorial illustrations. In this manner it is hoped to combine the very desirable features of prompt report and technical excellence. Attention has likewise been given to the column headed "Answers to Correspondents," which, for the first time, has been placed under separate management. The new arrangement has been of great service to subscribers in the country and abroad, who have freely availed themselves of the facilities offered for pushing their enquiries at head-quarters. An outcome of such intercommunication is the discovery that a wide-spread desire exists for practical instruction in the photo-mechanical processes, and suggests that the time has arrived when classes for the practice of Collotype, Woodburytype, &c., might very well be formed in one or more of our technical institutes.

As with the camera at public festivals, so the lantern display has come to be regarded as indispensable for lecture illustration. The tourist, naturalist, and historian alike resort to it as a ready means of enlivening a narrative or illustrating a point in science. The painted slides have given way to photo-transparencies, for which an endless number of requisites have been put upon the market. Scenes on land and sea, the starry heavens and nebulæ, gigantic explosions, street scenes, objects in motion, and the movements of animals, are all made to tell their tale through the instrumentality of the rapid plates now put into the hands of the photographer, and if he is not satisfied with the old developers, there are two new ones at least—pyrocatechin and eikonogen—with which he may feel inclined to experiment. Orthochromatic photography has been made the subject of further study by Mr. Andrew Pringle and Mr. C. H. Bothamley; new methods of platinum toning by Mr. Valentine Blanchard and Mr. Lyonel Clark; the acid fixing bath has been again revised, and flash lighting for home portraits has scored a success during the past year; whilst theoretical photography and measurement of density in negatives have received a fair share of attention from Professors Carey Lea, R. Meldola, W. R. Hodgkinson, and Capt. Abney; but whether the photo-chloride or oxy-chloride theory, or neither, is to be adopted, stands over for decision to another year.

PHOTOGRAPHIC TOURISTS' BAGGAGE.

IN the PHOTOGRAPHIC NEWS YEAR-BOOK for 1890 is an article by Mr. Fleetwood Pritchard, which gives useful practical information to the photographic tourist proper; that is to say, to the traveller who does not confine his expeditions to well-trodden routes, but who, independently of railways and other conveyances, carries all his luggage knapsack-fashion on his back. Such is the best method of travelling both for health and for information; the photographer is then free to quit the main routes frequented by the English; he can traverse footpaths and put up at wayside inns wherein a foreigner is rarely seen; he can talk with the villagers in their mountain homes, can enter into their joys and their sorrows, and see the people as they actually are. The photographer who is "put through" by tourists' agencies, or who independently traverses the ordinary routes, finds English spoken at all the large hotels, and everything about him made as English as possible, so that for the purpose of gaining some kinds of information he might as well have remained at home.

Supplementary to the suggestions of Mr. Pritchard, it is our object to point out additional precautions which should be taken in advance by the photographic tourist proper. One of these is that he should have a written list of all the articles he may require in his travels, keep this list permanently attached to the inside of his knapsack, and make additions to the written items as experience may dictate. In places where there are no shops within several miles, and where the few shops then to be found contain only articles of immediate necessity, such as those of food and clothing, the omission of trifling things obtainable at once in towns will sometimes be the cause of considerable annoyance. For instance, if he should desire to develop a few plates when away from home, to make sure on the spot, ere it is too late, that he has obtained some of the more important photographic records of his travels, he requires a few two or three-ounce bottles for his solutions, especially those solutions which are most liable to oxidation in the air. In the wayside inn or the mountain cottage he may find nothing but wine-bottles, which are scarcely good for the purpose, and the kindly hostess may empty her little bottle of *eau de Cologne* to one of those vast receptacles to oblige the stranger. A cork or two may be wanted; a wine-cork has to be cut down, and in a small bottle may more or less freely permit the passage of both air and liquids. The said photographic tourist never for a moment thought of putting a few gummed labels in his baggage, and having mixed his solutions, finds gum to be practically an article never seen in his temporary domicile; but after an hour's delay, when he cannot conveniently spare any time, some freshly-manufactured flour paste is obtainable. More serious is the omission of filtering paper of any description. He should never take out new apparatus if he can help it, however expensively it may have been made; the apparatus should always be well tested by experimental work for a week or two before he starts. The means for making small improvements or corrections are frequently not present in districts remote from towns. In fact, preparation for travel with light photographic baggage in regions far from the larger centres of human industry requires a considerable amount of care and forethought, which can be appreciated only by those who have had the experience.

One of the best things ever suggested in relation to tourists' baggage originated with Mr. William England, who, in the days of old, advocated the use of basket portmanteaus in place of ordinary portmanteaus; the former are very light, and give great protection to any glass articles they may contain. Captain Abney tried and publicly endorsed the merits of this plan, so also did Mr. Fleetwood Pritchard. Such portmanteaus should be lined with thin india-rubber cloth; they may be either specially made to hold apparatus in compartments, or the elegant French palm-baskets, resembling portmanteaus in form, may be bought ready-made at moderate prices in certain shops near Covent Garden. Our own workmen are not competent to manufacture them, so they have to be imported. With properly-constructed focussing glasses, focussing cloths will in time become unnecessary for small cameras, and the best cloth for the purpose, as originally published by Captain Abney, is common mackintosh; it is absolutely opaque and very light; moreover, it will always be useful as a protection for the table in the hotel bedroom when photographic operations are carried on thereupon. A wipe afterwards with a sponge or duster cleans the cloth. In studios, Italian cloth is excellent for focussing purposes, but it is altogether too heavy and bulky for tourists' baggage. In hot sandy places, where dust penetrates everywhere, Captain Abney's plan of rubbing a part of the interior framework of each slide with glycerine is good. One writer complained that it was bad because the glycerine found its way on to his plates; probably he applied too much glycerine, and had common slides; the place for the glycerine is in the grooved portion, where there is countersinking.

The perfecting of tourists' baggage is a subject which will demand closer public attention than it has hitherto received, for the requirements of not a few photographers bear relation thereto.

A "BRILLIANT NEGATIVE."—Many will perhaps say that it is better known than described; but, if a description had to be given, it would mean a plate in which the silver deposit ranged from opacity to clear glass, with a wide range of tone between. In many cases the description would be correct, and, if the colour of the negative were of the blackish or bluish grey obtained by the use of sulphite of soda or ferrous-oxalate, the resulting print would, no doubt, be a brilliant picture. But tinge the film yellow or orange, and the "brilliant negative" will give only hard, "soot and whitewash" prints. This was the rock on which the old collodion workers split; they found that with gelatine plates and pyro-ammonia development, what they had learned to regard as brilliant only produced irredeemable hardness. I should, therefore, be inclined to define a "brilliant negative" as one that gives a brilliant print, that is, a picture with a minute quantity of pure black and white, and a wide gradation of tone between.—*Journal of the Photographic Society of India.*

INTENSIFYING COLLODION NEGATIVES WITH HYDROKINONE.

BY DR. J. M. EDER.

For the purposes of photographic reproduction the collodion process is still of the greatest value. For photo-lithography, zincotype, lichtdruck, &c., collodion plates are better adapted than gelatine emulsion, because they more readily reproduce faint lines with clearness.

In the reproduction of line subjects, intensifying is generally effected by means of iodide of mercury, followed by blackening with sulphide of ammonium. We thereby obtain a very dense opaque deposit. For more delicate negatives, of half-tone subjects particularly, the well-known mixture of pyrogallic acid, nitrate of silver, and citric acid, has been hitherto employed. Captain Hübl, of the Imperial Military-Geographical Institute in Vienna, has introduced with success a process of intensifying with hydrokinone, nitrate of silver, and acid, resembling in action the old pyrogallic method, but safer to work.

With an unfixed wet collodion plate, this intensifier not only effects a harmonious strengthening of the picture, but it acts also by continuing the action of the developer which has preceded it, in bringing out details. Applied after fixation, it intensifies without injury to the clear shadows.

The action of this intensifier is, however, not like that of mercury solution, which acts only in proportion to the amount of reduced silver present, but a larger proportion is deposited upon the high lights, thus assisting in the production of brilliancy.

Captain Hübl mixes his re-developer according to the following formula:—10 grammes of hydrokinone are dissolved in 1,000 grammes of water, and so much acid is added that when the solution is mixed with one-third of its volume of a three per cent. nitrate of silver solution, it remains clear for the space of five minutes. The addition of a few drops of sulphuric acid or of five grammes of citric acid fulfils this condition. This intensifier is more delicate in its action than that composed of iron and silver, and has the great advantage over pyrogallic acid, that fixed negatives may be treated in full daylight, and the action renewed without danger as many times as may be desired.

At the Imperial School and Institute for research in photography and reproduction processes in Vienna also, Hübl's hydrokinone developer intensifier for wet collodion plates is worked with the best results, and is highly recommended by the staff.

In accordance with the foregoing formula, solutions were made of

A.—Hydrokinone	... ...	10 parts
Water	... ...	...1,000 „
Citric acid	... ...	6 „
B.—Nitrate of silver	... ...	1 part
Water	.. ..	30 parts.

Before use, 3 volumes of A (hydrokinone solution) are mixed with 1 volume of B (silver solution).

For a somewhat under-exposed negative, the plate is intensified with the accustomed sulphate of iron solution before fixing; by this means detail is got out. A properly exposed and fully developed negative, on the other hand, is intensified after fixing.

Negatives intensified with hydrokinone become so dense, that they suffice perfectly for all kinds of reproduction processes, photo-lithography, &c. If, however, complete opacity is desired, the plate intensified with hydrokinone is afterwards treated with iodide of mercury and sulphide of ammonium. We recommend all photographers who still work the wet collodion process to give the hydrokinone intensifier a trial.

ORNAMENTAL PRINTING IN PHOTOGRAPHY.

Much use can often be made of fine ornamental engravings found on ball orders and menu covers, also of scenery engravings, paintings, embossed, painted, or otherwise decorated plaques, in ornamental printing.

First, select your engraving, an assortment of which can generally be found in art stores or stationery supply houses. An engraving with a bust or view in a circle, or some other shape, gives most satisfactory results. If you wish to mount the print on regular size mounts, you will have to take the proportions into consideration, but as that would make selection difficult, the best plan would be to cut the mount to suit the print; the edges could be bevelled, and the whole mounted on a larger size gilt edge mount.

When the engraving is selected, place it in a good light, square to the camera, make a negative, and take a proof. With a thin-bladed and very sharp knife, cut out the circle or opening in the proof, being careful to make a single clean edge cut. Stick the centre cut-out exactly in the opening on the negative, and adjust the outside on the portrait negative you wish to print from. Take off a good print from the ornamental negative, which will now be blank inside the circle, in which space the portrait or view is to be printed. By holding the negative to the light, the print can be adjusted by looking through; the printed border will be protected by the cut-out around the portrait.

It is desirable to find a larger engraving than the finished work is to be, as reducing adds to its fineness.

If an engraving with a circle cannot be readily obtained, a landscape can be used, and a white card cut to any desired shape, with edges bevelled or otherwise ornamented, and artfully placed on. It adds to the effect if the corner be curled upward a trifle. This gives the form to cut out by.

Portraits can be *vignetted* in, in place of using forms, by aid of "dodgers." A good dodger can be made by cutting a card to the desired shape, and pasting on layers of white tissue paper, each layer a trifle larger than the one before. This grades off the light, and very little movement will be necessary. Tie a thread to it, and let it hang in contact with the negative over the spot you wish to keep blank, moving it slightly while printing. Then, to protect the border while the portrait is printing, make a dodger by cutting a hole through a card, and trimming the opening with tissue, to be used in the same way.

If a circle, oval, or arch-top form be used, the form can be embossed after the print is mounted and burnished. Many photographers already have one of the old embossing presses, and a new iron pattern to fit the form could easily be obtained.

An ingenious printer will see many ways in which to use the above for decorating showcases, reception rooms, for holiday trade, for use on silk handkerchiefs, hat crowns, &c. If you are looking for something new, perhaps this will assist you, as it has never been used by the profession at large.—*Boston Photographic Review.*

PHOTOGRAPHIC CLUB.—The subject for discussion on Wednesday, January 8th, will be "The Best Way of Storing Negatives"; and on January 15th, "Intensifying and Reducing Negatives."

LEWIS MORRIS RUTHERFURD.

THE *Scientific American* of December 14 gives a portrait of this scientist, together with an interesting account of his career. Mr. Rutherfurd, it appears, was born in New York in 1816, and comes of distinguished lineage, his grandfather being John Rutherfurd, twice elected to the United States Senate. Senator Rutherfurd's father entered the British Army at the age of seventeen, and after taking part in the Canadian campaign, resigned his commission, married a daughter of James Alexander—thus making him a brother-in-law of Lord Stirling—and became a citizen of New York.

His grandson (Lewis Morris Rutherfurd) selected law as the profession which he proposed to follow, and studied under Governor William H. Seward (afterwards Secretary of State in President Lincoln's cabinet) in Auburn for two years, and then in New York City with George Wood, who was at that time one of the foremost lawyers in the country.

In 1837 Mr. Rutherfurd was admitted to the bar of the New York State Courts, and entered into partnership with Peter Augustus Jay, the son of the Chief Justice who administered the oath to President Washington in 1789, with whom he continued until Mr. Jay's death, in 1842, and then he became associated with Hamilton Fish, who was afterwards Secretary of State in President Grant's cabinet. Mr. Rutherfurd continued in active practice until 1849, when he went to Europe. On his return he did not resume his profession, but thereafter devoted his leisure to studies in astronomy and optics. He erected an observatory in the garden of his residence, and there did his principal scientific work.

One of his earliest contributions was concerning the "Companion of Sirius," whose discovery had just been announced by Alvan G. Clark, the well-known maker of telescope lenses.

In 1861 he began a series of experiments with the view of determining the best form of instrument for the purpose of continuing Fraunhofer's observations upon the spectra of the heavenly bodies. He adapted Bunsen's and Kirchhoff's simple form of spectroscope, consisting of a condensing telescope with adjustable slit, a scale telescope with photographed scale of equal parts showing bright lines upon a dark ground, a flint glass prism of 60°, and an observing telescope with Huygenian eyepiece, magnifying about five times, the whole firmly but lightly mounted on seasoned wood, and provided with an adapting tube in front of the slit, by means of which the spectroscope is attached to the eye-tube of the equilateral. A year later he published his results in a paper, giving the fixed lines exhibited by the moon; also the lines and bands of Jupiter and Mars, with maps of the spectra of seventeen of the fixed stars, and including a full description of the instruments that he used.

This was the first work to be published after the great revelations of Bunsen and Kirchhoff, and was the first attempt to classify the stars according to their spectra. While Mr. Rutherfurd was engaged in making these researches on the spectra of the stars, he discovered the use of the star spectroscope, by means of which it is possible to show the exact state of achromatic correction in an object glass, and is particularly adapted for the rays that are used in photography.

In 1864, after many experiments in various directions, but all undertaken for the same purpose, he succeeded in devising and constructing an objective of $11\frac{1}{4}$ inches aperture and about 15 feet focal length, corrected for photography alone. It was constantly used by him in making negatives of the sun, moon, and star groups.

At the January meeting of the National Academy of Sciences, in 1864, he presented a paper "On Photographs of the Solar Spectrum," accompanied by a picture that he had taken by means of bisulphide of carbon prisms. It contained more than three times the number of lines that had been laid down within similar limits on the charts by Bunsen and Kirchhoff.

He also was the first to show the double character of the D sodium lines in the spectrum, finding that it "is resolved into fourteen fine and close lines, with a beautiful and symmetrical band of finely doubled lines stretching towards A."

About the same time he published criticisms on different forms of spectroscopes that had been used by Secchi, Airy, and Donati, and in 1865 produced an automatic form of a six-prism spectroscope, which still continues the best in use.

In 1868 he built a new objective, with 13 inches aperture and about 15 feet focal length. This glass was an ordinary achromatic, such as is used for vision, and was converted into a photographic objective by the addition of a third lens of flint glass, which made the proper correction, and could be affixed in a few minutes. With this instrument Mr. Rutherfurd made several photographs of the moon that are of remarkable beauty, and have never been surpassed in delicacy or exactness. One taken on February 27th, 1871, is stated by Warren de la Rue to be the finest in existence.

He constructed a micrometer for the measurement of astronomical photographs for use upon pictures of solar eclipses or transits and upon groups of stars, of which he has measured several hundred, showing, as it is claimed by him, that the photographic method is at least equal in accuracy to that of the heliometer or filar-micrometer, and far more convenient.

In 1870 he constructed a small ruling engine, which produced inference gratings on glass and speculum metal that were superior to all others until the recent productions of Professor Henry A. Rowland, of the Johns Hopkins University. With one of these gratings he obtained a photograph of the solar spectrum that for a long time was unsurpassed.

In 1883 failing health led to the discontinuance of his scientific work, and in December of this year he presented his astronomical instruments to the observatory of Columbia College, where they are mounted.

Besides membership in various other scientific bodies, Mr. Rutherfurd is an associate of the Royal Astronomical Society of Great Britain, and his work has been recognized by the gift of various diplomas, orders, and medals, both at home and abroad.

THE EYE AND THE CAMERA.—The eye requires at least a tenth of a second to close, so that all separate motions which are quicker than that appear blurred to one looking at them. It can easily be understood, therefore, how a photograph obtained of a moving object by an exposure of one-hundredth, or even, as sometimes is done, by one-thousandth part of a second, while accurately reproducing the exact position of the object at the time of photographing, is not a representation of the subject as it appears to the human eye. It does not convey the idea of motion even, but rather of "*petrified* motion," as some one has said, and seems grotesque and unnatural. Such photographs, however, give investigators an opportunity, which they otherwise could not have, of studying separate motions, and are often of the greatest value.—*W. I. Lincoln Adams.*

PURIFICATION OF LITMUS.—Dr. Otto Foerster, says the *American Druggist*, prepares the pure colouring matter of litmus in the following manner:—Commercial litmus of best quality is first extracted by ordinary alcohol in the cold, then digested with water, the solution filtered and evaporated. This is a combination of the processes proposed by Wartha and Mohr. The residue is again dissolved in water, the solution filtered, and the filtrate precipitated with absolute alcohol mixed with a little glacial acetic acid. The precipitate is collected upon a filter and washed with alcohol. This causes a violet, fluorescent colouring matter to remain in solution. The remaining residue is once more dissolved in water, and the precipitation, filtration, and washing repeated. At this stage a red colouring matter, which has a violet tint in an alkaline liquid, remains in solution. After once again repeating this process, only a small amount of the last-named colouring matter remains in solution. The precipitate upon the filter is then dried, being repeatedly moistened during the drying with alcohol, for the purpose of expelling the acetic acid. The precipitate is then again dissolved in water, and the solution filtered. Finally, the colouring matter is precipitated with alcohol rendered faintly alkaline with ammonia, then collected upon a filter, washed with pure alcohol, and dried.—After *Zeitsch. f. anal. Chem.*, 1889, 428.

A FEAT IN PHOTOGRAPHY.

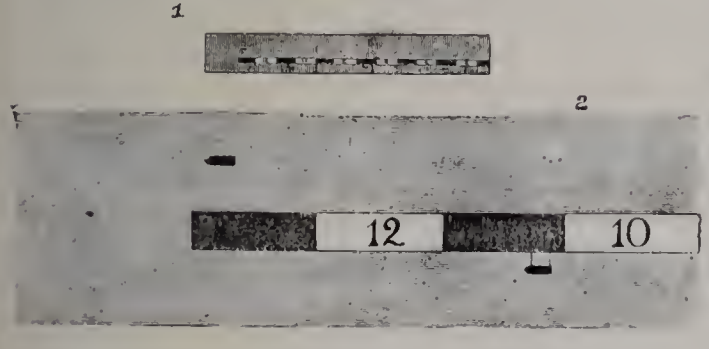
TROTTING horses, leaping acrobats, running hounds, even a locomotive at full speed, have proved comparatively easy subjects for instantaneous photography, but certain other moving objects have severely tested the skill of the photographer as well as the capacity of the apparatus employed.

Perhaps the most difficult feat yet attempted in the line of photograpy is that of catching an impression of a bullet or a cannon ball as it flies across the field of the camera. This has been accomplished with varying degrees of success, but most of the specimens of this class of work hitherto produced have been at the best mere streaks, not in any way resembling the projectile. This failure to procure a sharp impression is shown by the photograph itself to be due to lack of shutter speed.

A recent invention, to which we alluded a short time since in an article on "The Tachyscope," has apparently obviated this difficulty, so that it can no longer be said to be impossible to secure a recognisable picture of a flying projectile.

Last year Mr. Ottomar Anschutz, of Lissa, Prussia, tried some very interesting experiments at Gruson, near Magdeburg in Germany, which demonstrate the practicability of photographing a flying bullet by daylight. Mr. Anschutz constructed a small camera of great strength, in which he arranged a shutter of his own invention, which in this case was operated by an eight hundred pound weight. The shutter is arranged immediately in front of the sensitive plate, and consists simply of a curtain having a narrow slit as long as the plate, the width of the slit being variable. This slitted curtain passes over the entire face of the sensitive plate, exposing successive portions thereof to the action of the light. This arrangement insures a brief exposure of all portions of the image of the moving figure, thereby producing an extremely sharp negative. The slit in the shutter during this experiment was adjusted to a width of 0·002 of an inch.

[Figs. 1 and 2 represent the relative sizes of the photograph and its enlargement.]



In the field of the camera, which covered a space of 46 feet, Mr. Anschutz drew a canvas curtain, and at every $13\frac{1}{8}$ feet suspended a projectile 12 inches long, for comparison with a projectile of the same kind to be fired from a cannon. At a distance of 200 feet a wire netting was placed, which was connected electrically with Anschutz's drop shutter. The projectile passed through the wire netting at a velocity of 1,312 feet per second, and its image was caught on the sensitive plate after having sped along the canvas curtain a distance of 42 feet. The shutter passed over the plate in the short space of 75-1,000,000 of a second. The numbers marked on the canvas indicate the distance in meters. The projectile shown below the space between the 10th and 12th meters is one of those suspended for comparison; the other shown above the 13th meter is the one photographed in its flight.

The photograph we reproduce was furnished us by the United States Photograph Supply Company, of No. 3, East 14th Street, New York City, who represent Mr. Anschutz in this country.—*Scientific American.*

PHOTOGRAPHING INTERIORS.—Mr. G. Alpers says that gelatine plates should be exposed proportionately much longer than wet collodion ones. He had made the photograph of an interior with the aid of this last process, exposing for three hours, and he desired to reproduce this same interior on a gelatine plate which was from ten to fifteen times more sensitive. He supposed that an exposure of thirty minutes would be sufficient, but in developing he obtained almost nothing, and he was obliged to give an exposure of five hours. The author explains this singular fact as follows:—Bromide of silver is much more sensitive than the iodide of the same metal to the intense rays, whilst it is not more sensitive than iodine to the very weak rays. This explains why the negatives of portraits on gelatine are generally harder than those on collodion. To reproduce interiors having windows placed opposite the objective, the author covers them with red tissue paper, which he removes for a few seconds at the end of the exposure.—*Invention.*

A SUBSTITUTE FOR CHRISTMAS CARDS.—The *Birmingham Weekly Mercury* recently offered a prize in a "Suggestion Competition" for the best idea for something that would make a good substitute for Christmas cards. In their Christmas number of December 21st, they state that the two best suggestions are equal, and they have therefore divided the prize. One of the winners of the divided prize suggests that Christmas cards should be coupons to entitle the recipient to a chance in a prize etching or engraving lottery. The other winner is Mr. E. Smith. His suggestion is as follows:—"The popular form of Christmas greeting I would suggest as an equivalent for Christmas cards would take the form of photography. I would suggest that the large photographer of the city, the local photographer of the small town, and the amateurs who are now numbered by thousands, should carry out next year the following scheme. The pictures to be sent to our friends may be: (1) Family groups in interiors produced in the evenings by the aid of magnesium light, and printed by the artistic and permanent bromide process. The family may be engaged at dinner, playing some game, reading, writing, romping, &c. (2) The provision of multiplied copies of some object or objects of interest in a town or village, either printed faintly, or a part blocked out for the printing from another negative or single figures or groups in the foreground. (3) The pourtrayal by the same means as No. 2 of a scene in which the recipients are persons having some interest in the past, and in which the recipient may be represented, if necessary, by a friend who makes up for the absent man. Unless the friend was something of an actor in the posing, he had better be kept well in the background, or be nearly hidden by the other *dramatis personæ*. These would be *tableaux vivants*. For them the larger and wholesale photographers would have to keep background negatives, foreign, as well as home views. The merits of the scheme are that a more personal and interesting character can be given to the photographs than is possible with the vague and multiplied Christmas cards; that it would foster an artistic and dramatic taste, and afford scope for amusement, ingenuity, and humour in the carrying out; that the cheaper ones would entail less trouble, as well as cost, to those not having sufficient leisure; that the cards, conveying the next best representation of their friends, and their present or past surroundings, to the presence of the friends themselves, would be valued and treasured; that they would afford winter work as well as summer to the photographer, amateur as well as professional; and that the scheme would undoubtedly further develop photography as a fine art.

PHOTOGRAPHING WINTER SCENES.

ROUGHLY speaking, there are two classes of winter pictures which the photographer meets with on an outing. A typical landscape of one class is a snow-covered landscape in which trees, shrubs, buildings—everything—are completely enveloped in white. The trees and bushes glitter with ice; the fields sparkle beneath the sun. There are no contrasts, but only a mass of brightness, glitter, and glare. In order to photograph it satisfactorily, we must select a time of day when the sun is at one side of our camera and a little behind it. This is in the early morning or in the afternoon, according to the point of view which we have chosen for our camera. When the sun is obscured, the shadows are soft and the snow is devoid of reflections. On such days the winter picture we have selected can be photographed with advantage. The exposure should be rather short on such a day, for the light is rather weak, and the brisk development which is required will give a proper contrast and brilliancy to the negative. Isolated bits of frost work, a glittering bush sparkling with ice jewels, or a fence-corner covered with dazzling whiteness, should be photographed in a similar manner. Such subjects are very satisfactory when reproduced by the camera.

The other, and perhaps the largest class of snow scenes, is quite different from the one we have been considering; it is therefore photographed quite differently. In this class we have winter pictures of the greatest contrasts: dazzling whites and profoundest blacks; a field covered with glittering snow, edged with the darkest trees. The photographer must now overcome contrast, and give softness to the picture. As before, overcast days are chosen, and the exposures are made in the morning or afternoon; but the exposure must be ample, and the development very slow. This will aid in overcoming the brilliant contrasts in the natural view. Orthochromatic or colour-sensitive plates may be used with advantage in photographing such scenes. The developer should be rather weak, especially in beginning the process. It may be strengthened as development goes on, until the proper density is secured in the negative.

For developing negatives of the first class spoken of, the developer can be of full strength in order to bring out all the contrasts there may be in the picture, but it should be used cautiously, especially when first applied to the plate. In the development of snow pictures there is opportunity for the greatest skill. A well-selected and exposed plate may be lost by careless or ignorant development; while, on the other hand, errors in exposure may be to a great extent corrected by judicious developing. The new developing agent, eikonogen, has been used with good effect in this kind of work, as it renders the most delicate details in the half-tones and shadows.

Fixing, washing, and the subsequent processes are, of course, the same in this as in other classes of photographic work; but in toning and mounting winter pictures there is room for the exercise of good taste. Do not tone a winter picture to a warm brown, and mount on a chocolate card. Let the toning be carried to the cold blacks and whites, and mount on white or pearl cardboards. Bromide paper is peculiarly appropriate for winter negatives, and the platinotype may also be used with good effect. Ferro-prussiate or "blue" paper is especially suitable for printing many snow negatives, and when slightly worked over with colours harmonising with the appropriate blues and whites of the cyanotype, a delightful art feeling can often be given a blue print of a winter landscape. These additional touches, however, must not be overdone, the merest retouching here and there being all that is necessary to bring out a most pleasing result. They may be mounted with good effect on larger sheets of heavy paper, and framed in plain wood, narrow and light. Bromides and platinotypes should be similarly mounted.—*Abstracted from the Photographic Times.*

THE HARVARD COLLEGE TELESCOPE.

THE photographic telescope presented to the Observatory of Harvard College promises to be the most perfect instrument of its kind. It will have a lens of about twenty-four inches aperture, and a focal length of about eleven feet. It will differ from other large telescopes in the construction of its object-glass, which will be a compound lens of the form used by photographers, and known as the portrait lens. The focal length of such a lens is very small compared with its diameter, and much fainter stars can be photographed in consequence. The advantage is even greater in photographing nebulæ or other faint surfaces. Moreover, this form of lens will enable each photographic plate to cover an area several times as great as that which is covered by an instrument of the usual form. The time required to photograph the entire sky is reduced in the same proportion. A telescope of the proposed form, having an aperture of eight inches, has been in constant use in Cambridge for the last four years, and is now in Peru, photographing the southern stars. It has proved useful for a great variety of researches. Stars have been photographed with it too faint to be visible in the fifteen-inch refractor of the observatory. Its short focal length enables it to photograph as faint stars as any which can be taken with an excellent photographic telescope having an aperture of thirteen inches. The eight-inch telescope will photograph stars about two magnitudes fainter than can be taken with a similar instrument having an aperture of four inches. A corresponding advantage is expected from the increase of the aperture to twenty-four inches.

Other advantages to be anticipated from the use of such an instrument will arise from the opportunities which the photographs will give for continuous and detailed study. With them work can be done at any place and any time, and, by multiplying copies, by any number of observers. And with them more could be added by a single lens to our knowledge of the stars than could be obtained by any number of telescopes of the usual kind. Professor Pickering is seeking the best possible location at which to mount the instrument. Owing to the difficulty in maintaining regular observations in the Eastern States that arises from the prevalence of cloudiness, he suggests one of the mountains of southern California as likely to offer the most favourable climatic conditions attainable.

THE Christmas number of the *Photographic Times* is both poetic and artistic. It contains no less than five poems, and four illustrations exclusive of the ordinary illustrative cuts. The illustrations include "Christmastide in Shakespeare's Country," from a negative by Dr. J. L. Williams, the reproduction being by the Photogravure Company, of New York; a dog portrait, from a photographic portrait of a painting reproduced by the Electro-Tint Engraving Company, who also reproduce a film negative, by Mr. W. J. Stillman, of "The Facade of the Duomo of Florence;" there is also a pretty child picture by Husnik, with a descriptive article of his method known as "Leimtypie."

PICTURES SENT BY LIGHTNING.

For some time the transmission of pictures by electricity has been discussed as within the range of possibility, and we now find in *The Boston Herald* an account of an interview with an inventor residing in New York, according to which the problem has actually been solved; provided, of course, that the whole matter is based on fact, and not fiction. This is how our contemporary publishes the event, in the form of that favourite American mode of an interview.

"What would people say of a newspaper that published, say, a dozen pictures of the recent Sullivan-Kilrain prize fight, taken from instantaneous photographs, transmitted by telegraph, and reproduced in its columns within six or eight hours after the battle?" This was the extraordinary question put by L. Ginochio, a chemist, electrical expert and successful inventor, and it naturally caused the gentlemen who heard him to open their eyes wide in astonishment. M. Ginochio smiled. "I have not suggested an impossibility," he said; "indeed, I have already completed a machine which will do just the very thing I have mentioned. I have applied for a patent, and while its construction is to some extent a secret, I am willing to show you the machine in operation."

In his laboratory and experimenting rooms on West Thirty-fourth Street were a number of electrical machines of various descriptions. Great coils of wire lay around on the floor, and on tables were rolls of "No. 32" wire, as fine as the hair of a woman's head. Telephones, battery cups, galvanometers, electric switches, and other apparatus lay about in seemingly hopeless confusion. On a table was a box of about 20-in. square, attached to wires on an electric battery. A "feedboard" or shelf projected on one side of the box. "This is the machine that is to revolutionise newspaper pictorial art," explained Mr. Ginochio. "It is filled with clockwork, and operated by a strong electric battery. Its mate is at the other end of the line. Now you can write a signature or a letter, and it will transmit either, with the identical characters formed by your pen. But that would be nothing. Auto-telegraphy has been known for fully ten years. But this will carry out the auto-telegraphic idea to the fullest extent. You can write as much as you please, thousands of words if you like, as newspaper men and others frequently have to do, and this machine will chew it up—that is, transmit it as fast as you write. Indeed, the writing can be done on a continuous roll, and when a score of lines are written, the top of the roll can be fed to the machine while the writer continues filling up the rest, and without tearing the roll. It can be regulated so as to keep pace exactly with the pace of the writer, and by the time he has finished the machine will be on its last lap, and will end its task almost immediately. The newspaper or other office receiving the matter will thus have it in the writer's own handwriting, and within a few moments after it has passed out of his hands."

"But how is it proposed to transmit pictures?" "By the same method. The paper to be used will be washed with a weak solution of chloride of calcium, which will make it a conductor. The ink will be the non-conductor or insulator. The pictures will have to be reproduced with pen and ink at the point of sending, and with this as the only delay they can be transmitted without difficulty, every line and shadow being reproduced with extreme fidelity." "Have you tested the machine?" "I have, and found it worked like a charm. So long as the clockwork keeps running it cannot get out of order. This machine is designed especially for the use of the daily press, and will enable our newspapers to produce accurate and excellent pictures of events in the issue immediately following, instead of, as now, waiting a day or two for the artist. You can readily understand how such an instrument could be applied on a leased wire, where voluminous press reports have to be sent daily or nightly. Every reporter could then be his own operator. The delay in filling despatches would be obviated, and the slow-going Morse transmission superseded. Besides, another point in its favour, which all electricians will appreciate, is that the broader surface presented magnifies the electric ratio so greatly that, even at a time when ordinary telegraphic instruments are unavailable, on account of storm or for other causes, this machine will unfailingly give a connection strong enough to do the work required."

"What will the instruments cost when completed?" "I cannot tell yet, but they will be within the reach of every enterprising newspaper, you may be sure." The pictures transmitted by Mr. Ginochio's machine, though faint, are described as sufficiently distinct for all purposes. The minutest detail is reproduced with the fidelity of a photograph. Of course only pictures that have been first drawn upon the prepared paper can be transmitted. The time consumed does not exceed many seconds. A grinding noise, like the slow running down of a clock, is heard in the machine while in operation. With a few touches at the hands of a competent draftsman the pictures are sent to the engraver or electrotyper. If properly prepared in the first instance before transmission, Mr. Ginochio says they will not require retouching at all, as the machine will report electrically every mark upon the paper. Mr. Ginochio, the inventor, is an Italian by birth. His father was a man of considerable rank in the household of the first Napoleon, and was with the "Little Corporal" through many of his troubles. The son, who came to this country when a child, is a veteran of the civil war. He is stated to have many electrical and other patents now in operation in different parts of the States, but if his transmission of pictures by telegraph should prove a success, it would no doubt do more for him than all his other inventions.—*Invention.*

PROCESS work, it is said, has so diminished the demand for good box-wood for wood-engraving, that it is becoming difficult to procure, the best having nearly trebled in price in recent years.

INK FOR WRITING ON PHOTOGRAPHS.—The following formula is said to produce an ink serviceable for marking proofs; the writing being executed on a dark portion, the lines soon bleach by the conversion of the silver into an iodide:—

Iodide of potassium	10 parts
Water	30 ,,
Iodine	1 part
Gum	1 ,,

LONDON "IN CAMERA."—In an article in the *City Life* of January 1st, illustrated by five reproductions of instantaneous photographs by Mr. T. C. Hepworth, the writer says:—"The time is coming when we shall see London as it really is. A good many artists have tried to depict it, with more or less success. Hogarth drew its seamy side, Cruikshank its extravagant aspect, John Leech the picture of the middle class. All these attempts had their excellences, but to look at them now they seem to be more or less caricatures. In a hundred years hence, when future generations gaze at the instantaneous photographs taken in the London streets to-day, they will see the good-and-bad citizens of the nineteenth century exactly as they are."

TRADE UNION OF PHOTOGRAPHIC WORKMEN.—Mr. Arthur G. Field, Maidstone, sends us a letter advocating the formation of a photographic trade union. His proposal, he says, has no connection with an attempt to found a so-called "National Photographic Union" formed merely of representative photographers to guard the interests of the trade, but is in favour of the foundation of a *trade union*, to which every photographic *worker* (male or female) may belong on proving his or her capability. The object, he explains, will be as follows:—By paying a sum weekly (say 6d.) a fund will be created which will be applied to the payment of "donation benefit" or "unemployed benefit" to those out of work (say 10s. weekly). In case of disputes with employers the payment will also be made. By a system of qualification, either by apprenticeship, by receipt of wage for a number of months, or by examination, the ability of members will be assured. Each branch will send its monies to London, and London will make all payments of benefits to the branches—"centralisation, but federation," with direct responsibility of the executive to the smallest bodies capable of exercising electoral power. Those interested in the project are invited to communicate with our correspondent as above.

Notes.

Our suggestion last week *apropos* of the possibility of utilising Hansom cabs when on the rank for the purpose of obtaining instantaneous photographs of scenes in the streets of London appears to have "caught hold." The *Daily News* comments upon it, and prophesies that some one before long will be tempted to put the suggestion into practice. The *Daily News* does not name the source of its inspiration, but we do not grumble, as our contemporary has on nearly every other occasion when it has quoted from our pages—not seldom by the way—given us due credit. The *Globe* looks upon the photographic cab-driver as a person not to be encouraged. It is bad enough to know, it remarks, that one's private conversations may be handed down to posterity by the cabman who writes shorthand, but it is worse if the said conversations will be illustrated with "instantographs" of the tops of our hats and the ends of our noses. Frightful as this possibility may appear, it is within measurable distance, though the operators may not be cabmen with a fancy for photography.

The *Daily Graphic* is still an object of curiosity with those who know the stupendous difficulties to be overcome. We stated a week or two ago, upon reliable information, that wood blocks would be mostly used, as being more quickly produced than "process," though much more costly. The editor of *Science and Art*, who was present at the reception given at the *Graphic* office, states that but for photography and photo-mechanical printing, the scheme of a daily illustrated paper could not be carried out. The editor of *Science and Art* does not give any official information, and in the absence of this, we are inclined to adhere to our statement, and for more reasons than one. Whatever the *Graphic* will do, will be done artistically. Mr. Thomas' policy has always been to produce the best thing possible, and this policy will be carried out in the daily paper.

Mr. Thomas' notion is that a *rara avis* in the shape of a reporter who can sketch may be caught, and this is the kind of thing he wants to cultivate. We are afraid, however, that it will be a long time before he will get a man equally good with the pen and pencil. There are a few reporters with a taste for sketching, but to sketch with a pencil is one thing, to prepare a sketch ready for photographing, or to draw on the ordinary transfer paper suitable at once for zincography, is another. What the *Graphic* will probably do, will be to expect sketches as well as they can do them from its reporters, and have them "touched up" or redrawn by its own artists. This system has been going on for years both at the *Graphic* and *Illustrated London News*, and enables them to produce a number of highly finished drawings of scenes in all parts of the world, the foundation of which were the merest skeletons furnished by travellers. In this way a good deal may be done, but as for photography, it is out of the question. Even with the assistance of the electric light, the time required is longer than that in which a wood-cut can be produced.

The respective merits of photography and hand-drawings have been pretty warmly discussed by astronomers in regard to their own particular study, and the general opinion appears now to be that photography has advantages which drawings lack. It would seem as if very much the same battle was about to be fought by microscopists. When photography was applied to the microscope, everybody was in its favour; there are, however, signs of a reaction. Anyway, advocates of the older method of representation are not wanting. Mr. W. J. Simmons, in the *American Monthly Microscopical Journal*, urges that photography is too indiscriminately faithful; it perpetuates details, such as dirt and extraneous matters, which may well be left out of a drawing accurate enough for all practical purposes. Photography does not compel the thorough study of the object necessary when you sit to draw it, besides which it involves the expenditure of more time and money than many can spare. Mr. Simmons admits that photography is useful to correct the inaccuracies in a drawing, but, as a discipline for accurate observation, photo-micrography is inferior to drawing, and cannot be regarded as a substitute.

The automatic machine may perhaps revive the taste for the stereoscope—in a way. In Paris the two things have been combined. You drop in the usual penny, and apply your eyes to a pair of lenses arranged after the fashion of an opera-glass. Pictures are then displayed in rapid succession, one picture lasting seven seconds, until the contents of the box are all exhibited. The pictures are illuminated by the electric light, which is started by the mechanism which receives the penny. The automatic machine which delivers photographs of popular actresses is, we believe, not a very brilliant success. The automatic stereoscope might answer for a time.

The question of the site of the National Portrait Gallery has been settled. The new building is to be situated at the back of the National Gallery, on a piece of ground which, owing to the alterations effected by the construction of the Charing Cross Road, looks at the present moment a very dismal blank. The Office of Works, it is satisfactory to see, has an eye to the future, for it has got permission from the Treasury to purchase from the County Council the rights in a small triangular piece of ground which, if it were built upon, would effectually obscure the view of the new gallery. It is perhaps vain to expect that the glance of the Office of Works will be carried still farther into the future, and to hope that the new building will be constructed with an eye to the possible erection of a new National Gallery worthy of the art treasures possessed by the nation.

OSCAR GUSTAV REJLANDER.

BY H. P. ROBINSON.

THE idea of an exhibition of all that could be gathered together of the works of O. G. Rejlander at the Camera Club was a happy one, and will serve to recall to the memory of many photographers the great artist and genial friend who honoured our art with his genius; and he was the greatest genius who ever gave up to photography talents which would have enabled their possessor to shine in any form of art.

Rejlander was one of the earliest friends I made through photography, and it gives me great pleasure to respond to the request of the Editor of the PHOTOGRAPHIC NEWS to say a few words on the man and his works. I first met him at a meeting of the Birmingham Photographic Society in 1858. He was then living in Wolverhampton, and shortly after our meeting he came to visit me at Leamington; from which time until his death in January, 1875,* we continued in the closest friendship, and for many years, in photographic criticism, our names—perhaps because we had the same aims, and partly also, probably, for the sake of alliteration—were coupled together, a conjunction of which I have always been proud; and it is a curious coincidence that our works have again come together, or, rather, followed each other, in the "One Man" exhibitions of the Camera Club.

At the time I have mentioned, Rejlander had made himself famous by many pictures which were far and away, in all essential art qualities, beyond anything that had ever been before shown, and especially by his wonderful composition which represented allegorically "The Two Ways of Life." This was first shown at the Art Treasures Exhibition at Manchester, in 1857, to which exhibition, by the way, I had sent my first poor efforts at pictorial photography. This famous picture, as was also much of his best work, was executed at Wolverhampton, in a small studio in which many a photographer would scarcely have found room to photograph a single head. Here this astonishing group, consisting of about thirty figures, and attempting the highest poetry in art with so much success as to gain respect, if not approval, from all, was put together. Anyone but an enthusiast would have seen the impossibility of success with such a subject in such materials, but amid difficulties that would have scared most men, Rejlander saw only the end, and if he did not succeed in reaching it, his failure was almost as honourable as complete success.

Apart from the subject, which is allegorical, and partly carried out by the use of the nude—now ruled, and rightly, to be outside the natural limitations of the art—the picture is a marvel of skill and excellence. In composition and in clearness of story telling it has never been surpassed in any art, and the apparent impossibilities he overcame have always been a wonder to those who know most of the means by which it was produced. No photograph has ever met with so much criticism, for and against. It was rejected at an Edinburgh exhibition, not, however, on its artistic merits; a picture intended to convey the highest moral was rejected because of its supposed immorality. It would take too much space here to trace the courses of the two youths, who are represented as going the two ways of life, the one to the good and the other to the bad. In 1858 Rejlander was persuaded to read a paper before the Photographic Society of London—the only one he ever read—in which he explained the meaning of every figure. At the same time, with the generous intention of being of use to photographers, and to further the cause of art, he, unfortunately, described the method by which the picture had been done; the little tricks and dodges to which he had to resort; how, for want of classic architecture for his background, he had to be content with a small portico in a friend's garden; how bits of drapery had to do duty for voluminous curtains; a simplicity into which others also have fallen, and thereby gave the clever critics the clue they wanted, and enabled the little souls to declare that the picture was only a thing of shreds and patches. It is so much easier to call a picture a patchwork combination than to understand the inner meaning of so superb a work as this masterpiece of Rejlander's! He had a sense of the injustice of judging a work by the method of its production. He says in his paper, "I have a lively presentiment that the time will come when a work will be judged by its merits, and not by the method of its production; and then, with some fostering care, things can and will be done that scarcely believers, and never unbelievers, yet dream of in their philosophy."

This picture was Rejlander's greatest effort, and I much regret that the committee of the Club was not able to secure a full-sized copy for exhibition: the small reduction gives a very inadequate idea of the large picture. In his paper the artist promised other and greater efforts in succeeding years; this promise was never destined to be fulfilled. He often regretted that he never afterwards found time, and, indeed, the means—for such pictures are expensive to produce—to carry out his intention. He felt that such ambitious work was not properly appreciated, but he never lost faith in the method of combination printing, of which he was the originator, and occasionally employed it for smaller pictures up to the last. One of these, now in the Camera Club Exhibition, I greatly value. He was always brimming over with happy ideas, and would at any time prefer to express himself in a picture than writing. I was once in the middle of a now long-forgotten controversy, endeavouring to defend our art from those who could only see in it a mechanical trade, when I received the little picture I have mentioned from him. He was a volunteer as well as an artist. The photograph represents Rejlander the artist jumping up from before his easel to introduce Rejlander the volunteer. The contrast between the artist in velvet coat and broad-brimmed felt hat, and the same man in the same picture in his regimentals, was startling. Under it was written "O. G. R. introduces himself as a volunteer to H. P. R.," thus delicately and pleasantly conveying that his help was at my service.

In ordinary manipulation Rejlander could not be called a perfect photographer; so that he conveyed his thoughts clearly, he did not care for delicacies of development or clean plates. To him art was a vehicle for conveying a thought. It was the thing to be said, not the manner of saying it, that demanded all his powers. He could never see the beauty of the indefinite. Being without affectation, a sound artist and real poet, nothing short of real art and true poetry would satisfy him. Though most original, he abhorred the eccentric.

Perhaps, after all, it was in fertility of ideas and imagination, and the readiness with which he used them, that he was at his greatest. As an example of his readiness, here is an illustration. He once sent home a portrait of a bright little boy dressed in velvet coat and knickerbockers.

* Both Almanacs record his death as taking place in January *and* June. This was obviously impossible. The real date was January 18th, 1875.

The boy had one hand in his pocket, and the action bent the figure a little aside. The picture was rejected because the figure was not upright. Rejlander immediately wrote underneath it, "I've got a pocket too!" and the picture was at once a tremendous success. Yet I remember an occasion when it happened that a title he strongly objected to turned one of his pictures into the most popular photograph of the day. It happened this way. He sent to an exhibition a picture of a very little boy yelling furiously. He was then making experiments in expressions to illustrate Darwin's "Expression of the Emotions in Man and Animals!" and entitled this photograph "Mental Distress." In his notice of the exhibition, a former Editor of the PHOTOGRAPHIC NEWS, the late ever-regretted H. Baden Pritchard, called the howling youngster "Gink's Baby." This hit the humour of the hour, which was then much interested in a book of that name, and it became the photograph of the day and sold by thousands; but Rejlander was never reconciled to the loss of his scientific title. Many examples may be quoted of his happy thoughts, both pathetic and humorous, but it would be difficult to describe them so as to do them justice, unaccompanied by the pictures. "Grief," "Night in London"—a most moving picture of a ragged and desolate boy seated on a doorstep—and "'Tis Light within—Dark without!" a blind woman singing, are examples of the pathetic that occur at the moment; while the humorous are represented by "Did She?" one man (Rejlander himself) telling an amusing secret to another, whose face expresses a full appreciation of what he hears, and "She is looking at me, the dear creature!" an ugly and vain old man smirking and looking out of the corners of his eyes.

In the very interesting book of Darwin's I have mentioned, are several figures in which Rejlander has tried to express in his own person the expressions intended to be conveyed. The contrasted figures of Anger and Humility on Plate VI., figures 2 and 3, are perfect, and show what possibilities as an actor were in him had he followed that branch of art.

Personally, Rejlander was beloved by all who knew him. His winning ways, his kindly genial charm, his ever fresh and humorous anecdotes, his quaint thoughts and original expressions, his enthusiasm for all art, and especially for the art of his adoption, his simplicity and sincerity, endeared him to his many friends. He was never known to use a word that would hurt the feelings of others; he preferred to be silent rather than condemn the work of another, and always took great delight in praising the attempts of a brother photographer when he honestly could. His was not one of those envious natures that cannot brook any success not his own; he rejoiced in the progress of the art, even when it was accomplished by other hands. He was absolutely free from petty jealousy. It was not necessary, nor his way, as it unfortunately is the way with some photographic aspirants, to denounce all art and artists so that he may stand in the foreground on his own little molehill. He was a rare man, a great artist, and a loving friend.

ELIMINATION OF HYPO.—Writing on the claim so often and so generally made, "that salt in the water in which prints are washed is a powerful aid in ridding them of hypo," Mr W. H. Sherman contends that "the function of salt water containing prints impregnated with hypo is to seriously hinder its elimination;" and that "it is, therefore, a serious mistake and loss of time to use it for the purpose of facilitating the accomplishment of that object."

Notices of Books.

THE OCEAN OF AIR: METEOROLOGY FOR BEGINNERS. By Agnes Giberne, with Preface by Rev. C. Pritchard, F.R.S. *(Seeley and Co., Limited, Essex Street, Strand.)*

THE student of photography in its scientific aspects should include in his course of study the principles not only of chemistry and optics, but also of meteorology, between which and photography there is a close relationship, for while in this day the changes of weather are recorded photographically (as shown in the book under notice), those changes themselves affect photography to a degree that is more commonly experienced than understood. Temperature affects not only the developing, fixing, and toning baths, but also lenses, which not unfrequently suffer, for instance, from the effects of frost, owing to the contraction of the brass rims, while condensed moisture ("water-dust," as it has been termed) on the glasses in cold weather is a common form of inconvenience. If it were necessary still further to urge the importance of meteorological study, argument might be found in the necessity of taking account, for the production of successful results in photography, of the optical conditions of the atmosphere, the requirement of attention to the correct representation of clouds in landscape, the hygroscopic properties of many substances used in photography, and the usefulness of some ability to calculate the probability of weather changes.

Though the volume before us is professedly written for beginners, and may not contain such specific information for photographers as is given, say, in Mr. Vincent Elsden's admirable papers in our pages some years since on "Meteorology for Photographers," still it embraces much that is well worthy the study of all who wish to obtain, in simple and graphic language, a general and intelligent conception of the nature of the phenomena in the midst of which we live. The interest of photographers in Miss Giberne's book will certainly not be decreased by the fact that it is illustrated by sixteen admirable illustrations engraved from instantaneous photographs.

MEASURING THE SPHERICAL AND CHROMATIC ABERRATION OF OBJECT-GLASSES FOR THE MICROSCOPE. C. J. A. Leroy.—In the present state of construction the problem of achromatism may be considered as solved, whilst this is far from being the case with aplanetism. The correction of spherical aberration requires, therefore, to be studied for the improvement of objectives.—*Chemical News.*

KIDDERMINSTER PHOTOGRAPHIC EXHIBITION, MARCH, 1890.—Several intending exhibitors having misunderstood rule 1 of the prospectus of the above, the Secretary desires to state that the entrance fee in each class is 2s., covering any number of frames. Also, in answer to the questions of numerous enquirers, he announces that the date for sending in application for space will be extended to February 1st, 1890.

PERMANENCE OF NEGATIVES.—Negatives developed with pyro. are quite as permanent as those treated with the ferrous-oxalate developer, if care be taken to ensure perfect fixation. Leave the negative in the fixing bath fully three or four minutes after it has been apparently fixed, and years will find its colour and printing qualities unchanged. With the ferrous-oxalate developer errors in exposure may be corrected to a certain extent, but not so much as with pyro. When development flags, a drop or two of the fixing solution will accelerate the action of the ferrous-oxalate developer considerably, but nothing will save a much under-exposed plate. As with pyro, the bromide of potassium or ammonium acts as a retarder of development.—Editor, *Journal of the Photographic Society of India.*

THE PROGRESS OF QUINOL DEVELOPMENT.*

BY ALFRED MASKELL.

THE difference of working with quinol is chiefly this: that whereas with pyro you commence with the bath uncompleted in composition and by tentative action, now that this is added according to the behaviour of the negative, with quinol you select the bath of suitable energy and modified composition, and allow the action to go on until its duty has been fulfilled in all particulars of which it is capable. Supposing the right one is not at first selected, still you cannot go wrong provided the succession of baths is in an increasing ratio of energy. The method of pyro development is not so applicable in this case. There appears to come a point when increasing quantities of alkali do not produce the same progressive effect, at the same time that in the composed bath there is great latitude in their proportional quantities without producing fog. With a properly composed developer we commence development with a strength of alkali which we do not intend to augment, and the action is allowed to proceed in assisting to bring out all possible details of which it is capable, the quinol concurrently acting its part in building up the requisite amount of density. A greater proportion of quinol will produce greater density, but the normal proportion can in every case be made to produce the same intensity of density, whether the bath be new and powerful, or old and worn out. In the latter case the action must always be slow, its application being to cases of extreme exposure. A point to be remembered is that in the repeated use of the same developer, the bath becomes more and more charged with a powerful restrainer, produced by the bromide of soda resulting from the combination of the bromide given up by the plates previously developed with the soda of the developer. I will now proceed with a description of what I consider the best method of using the quinol developer. This consists simply in a selection, from what may be called a battery of baths of different degrees of energy, of that one most suited to the exposure which the plate has received. For short exposures a new and powerful bath; for long, an old and previously used one. If you use a new bath for a prolonged exposure, you will infallibly fog. With an old bath for long exposures, interiors, dark woods, and so on, you will get fine contrasts; if the old bath refuses to develop, add quite new solution, as may be necessary. For instantaneous work a new bath has been recommended, but I think the addition of a third of an old bath is better. Warming the solution will produce greater energy. It must be borne in mind that a new bath may be too strong or too weak, according to its composition; it may be too strong, also, for instantaneous work taken in June, although correct for that done in January; therefore you must know the primary standard of the bath you use, and regulate accordingly. For contrasts, use an old bath; for softness, a more powerful and less exhausted one. Development should be carried on until the negative appears to veil over, the details almost entirely disappearing.

My practice is to keep the most energetic or least used baths in five or six four-ounce bottles, keeping them full to the glass stopper. As a plate is developed by one I mark the label accordingly, whole-plate, half-plate, lantern-plate, &c., as the case may be. You soon, in this way, acquire a sufficiently accurate idea of the state of energy of the contents. I have never thrown away any solution since I first used quinol, as it is always useful, however much exhausted.

For lantern plates or bromide paper you must use new, or, at any rate, clear solutions; but quite a couple of dozen lantern-plates may be developed in the same four ounces of developer. The question of warm tones for these depends on the protraction of the exposure and the development in a weak or used bath. The alkalies ordinarily used, as I before stated, are the carbonates or hydrates of soda or potash. The caustic alkalies are undoubtedly the most energetic, but I myself prefer the fixed ones. The hydrates tend to frilling; besides, within reasonable limits, I am contented with the slower development. For those who prefer to buy their developers ready made, there are a large number in the market. The Hintokinone of Messrs. Hinton and Co. is very good, both for lantern slides and bromide paper. The ready-made preparation which I have found the best is that made by Messrs. Mercier, of the Faubourg Montmartre, the salts being sold in crystals, with instructions for making up. So far as I know by weighing these, it consists of 61 grains quinol, 492 grains sulphite of soda, and the same weight of carbonate of soda to 18 ounces of water, the sulphite being tinged with cosine, perhaps to give the bath a non-actinic colour. Mr. Mercier says, in his description, that an organic corrective is added, capable of neutralising the most feeble traces which may remain of free—that is, of uncombined—soda. I do not know what this corrective may be; perhaps he adds something in the nature of acetic or gallic acid.

The formula which I prefer is that of the Photo. Club of Paris. It consists, roughly speaking, of ½ of an ounce quinol, 2½ ounces sulphite of soda, and 5 ounces carbonate of soda, all avoirdupois weight, with the addition of 8 to 10 drops acetic acid. The exact composition, together with a few other formulæ and additional remarks, will be found in the paper which I lay on the table, and with which I need not weary you by reading at length. With the exception that the quinol is not dissolved in alcohol, it appears to me to be identical with M. Balagny's first published formula.

An excellent method of intensification is to bleach with mercury, and redevelop with a used quinol bath. Some months ago I soaked a dry plate in quinol developer and exposed it; on immediately returning to the dark room, I found the development completed. There is no practical utility in this, but it has struck me that the idea might be applied to enlargement with a view of controlling the simultaneous exposure and development. If time permits, at the conclusion of the discussion, I propose to try this experiment here with the aid of the optical lantern and limelight. If at all successful, several modifications will suggest themselves.

I will now bring under your notice the examples which have been so kindly placed at my disposal by Messrs. Mawson and Swan, together with a few others—not so many, I regret to say, as I had hoped to be able to present to you. In producing these specimens, I acknowledge the difficulty of coming to a reliable conclusion from a cursory examination of them. Conclusions, to be of value, require very careful and minute study, and it would not be possible to give this to them in this room, and at the present time; still, it is the best that can be done under the circumstances, and they are worth something to you, at all events, even now.

The experiments made by Mr. Clark were upon a

* Continued from page 875, vol. xxxiii.

graduated sensitometer screen. I will not be hardy enough to deny the value of these; at the same time, it must be remarked that the light used was artificial, and the varying colours of natural objects which we have to translate into black and white were wanting. I cannot do better than hand round Mr. Swan's examples, with a *résumé* of the remarks made by himself on the reading of his paper. The next is the result on a somewhat difficult subject of an exposure of two minutes, the correct exposure being about two seconds. I may mention that I placed the negative in a very old bath, and simply left it to itself for four hours. A better mode of development might have been employed, but this was purposely done. There is also a print from it. The others are comparisons of pyro and quinol, part of some experiments with this object which I was unable to complete. I show also on the screen some slides to illustrate different tones or colours. Many of them are by Mr. Victor Corbould, who will, I dare say, explain to you his method. I have also a selection of negatives on Eastman films, kindly lent to me by Mr. Ashburner. I selected them out of several hundred for the specialities which they illustrate, and the excellence of many of them will, I think, be generally admitted, notably the one on the very thin skin, which has a fine amount of gradation. This 5 by 4 negative I show to illustrate the yellow stain of under-exposure on some plates; it is a Thomas's thick-coated extra rapid. These two on Thomas's thick-coated ordinary show a curious eating away or disintegration of the film, which I have remarked now and again. This is an instantaneous exposure with a hand-camera on a Lumière plate, the day in September rather dull.

(To be continued.)

PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.*

BY W. JEROME HARRISON, F.G.S.

The Warwickshire of To-day.—And, lastly, we come to our own times. It is clearly our duty to secure, so far as in us lies, a faithful representation of the state of things as it is to-day. For every year we are "making history," and such a record will be just as much prized by posterity as we should ourselves prize it did it exist for the past. Just think what would be the value of good photographs of Bacon and of Shakespeare; or of Queen Elizabeth and her minister Cecil. Looking forward into the centuries, we can discern a time when no less value will be assigned to Mrs. Cameron's grand photographs of such men as Herschel and Tennyson; with those by other workers of our good Queen Victoria, and her "men of mind," Salisbury and Gladstone.

We must accumulate portraits, then, of all our local worthies. And to them we must add street scenes—secured with the hand-camera—from all our towns; delineations of the avocations of the people must also be obtained, from the country labourer in his smock-frock—a garment now rapidly disappearing—to the skilled artisan of the city, seated before his lathe. Nothing that illustrates contemporary life must be omitted; the policeman, the soldier, and the volunteer must adorn our albums; and we must go "slumming" to depict the shady side of life.

Most congenial will be the task of recording the cottage and village scenery of Warwickshire. I have travelled round the world, I have spent many holidays in various parts of the British Isles; and I can assert, without fear of contradiction, that for characteristic pictures of rural and home life our county is unequalled. Take the string of Shakespearean villages along the Avon, for example:—

> "Piping Pebworth, dancing Marston,
> Haunted Hillborough, hungry Grafton,
> Dadgeing Exhall, Papist Wixford,
> Beggarly Broom, and drunken Bidford."

Let anyone who loves English scenery drive (with his camera under the box-seat) from Warwick, through Charlecote (the home of the Lucys), to Stratford; and thence on to Evesham and Tewkesbury, calling at the villages named in the above *quatrain* (said to have been penned by Shakespeare) *en route*. Let him not hurry—take a fine week in (say) June—and I will answer for it that he will ever afterwards mark that excursion with the whitest of white stones.

In writing this brief account of our county, I must acknowledge my indebtedness to Mr. Sam. Timmins's recently published "History of Warwickshire;" but I have also studied most of the original authorities from Dugdale to Halliwell. Our noble Free Reference Library contains practically everything that has been published on Warwickshire; and some useful county books are also to be found in the Old Library.

If we are to "survey" Warwickshire in earnest, we must become students as well as photographers (and to my mind this will be one great good resulting from the task); we shall have to think of something else besides the beautiful and the picturesque; and we must remember that its associations may dignify the meanest dwelling, and render of world-wide interest the most prosaic surroundings.

Scientific Studies for Warwickshire Photographers.—Archæology—the study of the past—and Ethnology—the study of the inhabitants of the district at the present day—we have already touched upon. But there is much work also to be done in Geology, Botany, and Zoology.

The Geology of Warwickshire.—The coloured maps issued by the Geological Survey show the different strata of which the surface of the county is composed; and in a book which I wrote in 1881* a general description of the rocks of the county will be found.

Every landscape depends for its main outlines upon the rocks which lie beneath the soil; and for those who can "read the rocks" the study of the scenery of any district has a double pleasure. The oldest rocks of Warwickshire are the Cambrian quartzites and shales which lie between Atherstone and Nuneaton. These had been wrongly assigned to the Carboniferous period by the Geological Survey, and the discovery of their true age was made by Professor Lapworth and myself in 1882. The quartzites (altered sandstones) are magnificently exposed in a series of immense quarries, and they are traversed by great masses of dark, igneous rocks. The shales are well seen in the Stockingford railway cutting.

In the Warwickshire coal-field, photographs of the surface works, collieries, and colliers might be secured; while, descending beneath the surface, the flash-light would enable us to secure interesting records of the mines and miners.

Of the Triassic strata which succeed, there is a fine

* Continued from page 872, vol. xxxiii.

* "Geology of the Counties of England, and of North and South Wales." Kelly and Co. 8s. (Now out of print.)

section of the red sandstone, sixty feet in vertical height, at Hockley Cemetery, in Birmingham. Elsewhere the Triassic rocks are but seldom exposed, and we must be content with noting the level plains and rolling hills produced by their marls and sandstone.

The Liassic strata—limestones and clays—which rest upon the Trias, are quarried at Wilmcote, Binton, &c., in South Warwickshire. The fossils contained in these and in other local rocks, of which there is a grand series in the Warwick Museum and in the Museum of the Mason College, Birmingham, will form interesting subjects for our cameras.

Lastly, we have the Drift, including those confused beds of clay and sand, often containing great blocks of rock (erratics), which have been conveyed from Wales or from Scotland by the agency of ice during the glacial epoch. The immense boulder which lies in Cannon Hill Park (Birmingham) is a fine example of such a travelled block; but there are hundreds of others, and they are continually being destroyed—the farmers blow them up with dynamite. So, too, with the sections—the quarries, railway cuttings, &c.—where the solid rocks are finely exposed. They change from day to day, until at last they are grassed over and lost. Let it be our task, by the aid of photography, to record their features for ever for the students of geology.*

The Botany of Warwickshire.—The flora of our county has been carefully studied and described by Messrs. William Matthews, M.A., J. E. Bagnall, A.L.S., W. B. Grove, B.A., and other specialists. Artists have long visited our parks—Packington Park especially—to portray the grand old trees which adorn them, remnants of the old forest of Arden. Photography can admirably record every twig and leaf. It is certain that good photographs of plants, especially if taken while growing in their native haunts, would help to vivify the dry leaves of herbaria, and they would be much valued by those who study and teach botany. I have seen some exquisite work in this direction done by one of our members, Mr. Charles Pumphrey. Let me advise those who make this branch a speciality to photograph trees either early or late in the day, when the nearly horizontal rays illuminate their trunks. Let photographs of the same tree be taken at different seasons of the year; then shall you be able to prepare a series of "dissolving views," in which the tree shall be shown to bud and blossom, be covered with leaves, and anon be bare, yet beautiful with frost-rime.

(*To be continued*).

CAMERA CLUB NOTICES.—Thursday, January 2nd, 8 p.m., Lantern Evening; Monday, 6th, 8.30 p.m., Smoking Concert; Thursday, 9th, 8 p.m., Mr W. H. Walker, "The New Rollable Celluloid Film;" Thursday, 16th, 8 p.m., Mr R. Tindall, "Plane Polarisation of Light;" Monday, 20th, 8 to 9.30 p.m., Mr. Roberts will be prepared with the lantern if any member or members send him advice to the Club that they would like to try slides; Thursday, 23rd, 8 p.m., Rev. T. Perkins, "English Church Architecture as a Subject for Photography"; Thursday, 30th, 8 p.m., Mr. T. R. Dallmeyer, "On some Practical Deductions from the Law of Conjugate Foci"; Monday, February 3rd, 8.30 p.m., Smoking Concert; Thursday, 6th, 8 p.m., Lantern Evening; Thursday, 13th, 8 p.m., Mr. Graham-Balfour, "Landscape."

* See paper on "Aid Rendered by Photography to Geology," by W. J. Harrison, PHOTOGRAPHIC NEWS for 2nd October, 1885.

Patent Intelligence.

Specifications Published.

16,894.—*November 20th*, 1888. "Photographic Cameras." WILLIAM RITCHIE BAKER, 94, Seaside, Eastbourne, Sussex, Chemist.

According to this invention the camera is made to contain a number of sensitized plates which can be used in succession. The plates are arranged one in front of another in a receptacle at the back, or it may be at the sides of the camera, and an opening furnished with a close fitting cuff or sleeve is provided, so that the hand can be introduced to arrange the plates without the admission of light. When the pile of plates is at the back of the camera they are separated from one another by opaque paper or the like, so that the front plate can be exposed to the light without the others being acted upon. When a picture has been taken the front plate is removed and placed at the back of the pile, leaving the next plate in position for the next picture.

In place of employing a transparent screen of ground glass for receiving the image whilst the lens is being focussed, as is now usual, I employ an opaque screen, and view the image upon it by a hinged mirror or other convenient means. I prefer to hinge the screen so that, when in position for receiving the image, it lies in front of the pile of plates at the back of the camera, but can be drawn up and made to lie against the inner side of the top of the camera when it is desired to take a picture.

In order that the screen may occupy exactly the same position as the plate to be acted upon, I place springs at the back of the pile of plates, so that the screen, when lowered, forces the pile slightly backwards, taking the place of the front plate. When, however, the screen is drawn up out of the way, the springs force the pile of plates forward again into position.

The camera is provided with two doors, one at the top and the other at the bottom. That at the top serves as an opening through which the opaque screen can be viewed, whilst that at the bottom is for the manipulation of the plates, as above described.

In order to render the camera as compact as possible, I carry the lens upon the end of a drawer which, when pulled out, gives the requisite focus length, the focussing being performed by adjusting the distance to which the drawer is pulled out.

I do not fix the lens rigidly to the end of this drawer, but I connect it to it by mechanism in such a way that when the drawer is closed the front of the lens lies flush with the end, but when the drawer is pulled out the lens is protruded.

The inventor claims:—

1st. A photographic camera having a receptacle or changing box carrying the sensitive plates or other media, this said receptacle or changing box being arranged to move within the body of the camera in a backward or forward direction, an opaque focussing screen arranged on the front face of the said receptacle or changing box, a hinged mirror, and a suitable close fitting or sleeve.

2nd. In a photographic camera the combination of an opaque focussing screen with a movable receptacle or changing box holding the sensitive plates or other media.

3rd. In a photographic camera the combination of an opaque focussing screen with a mirror, and a suitable aperture and door in the door of the camera, for viewing the said mirror.

14,537.—*16th September*, 1889. "Photographic Cameras." WILLIAM SCORER, Watchmaker, Jeweller, and Photographer, North Street, Havant.

The inventor says that his invention consists of a front to be used as part of a photographic camera, to hold the lens in any convenient position opposite the slide containing the sensitive plate, and which has the means of moving the opening containing the lens to any convenient position, the device being a great improvement upon the usual vertical and horizontal slides to which the lens is usually fixed. This form of front, he says, is particularly adapted to the form of camera having a parallel

bellows, but may also be used to advantage with a camera having a taper or conical bellows, having also a rising front. He describes several other devices in the construction of photographic cameras.

16,593.—*October 21st*, 1889. "Optical Illusions." JACOB KELLER, Merchant, of 10, Perlenpfuhl, Cologne, and GUSTAV CASTAN, Sculptor, of 13, Stühlerstrasse, Berlin.

The invention chiefly relates to new combinations and arrangements of mirrors, which give the visitor the impression that he is placed in a labyrinth formed by colonnades or arcades, mirrors and painted views.

Although the apparatus occupies a very small space, the inventors say that the visitor believes himself to stand before endless colonnades, and, if tempted to enter the same, he finds himself suddenly stopped by a mirror, from which the deep colonnades seem to extend to the right and to the left.

They say that one illusion represents a tropical garden, and the background forms the entrance to a Moorish Temple, while palms and exotic plants are placed between the mirrors. Owing to the multiple reflection, the single entrance appears like an entire mosque, surrounded by a tropical garden. The space in which the visitor stands occupies scarcely two square meters, but the whole looks like a great palm garden in a tropical country.

The invention also comprises a specially constructed camera or kaleidoscope, which has the shape of a regular tetrahedron. The upper three sides of the tetrahedron are formed by three large triangular mirrors, the edges of which are ground and fitted together, so that the whole appears to be made of one piece. The chamber is entered from below through a circular staircase, and a second staircase serves for the exit.

The visitor ascending the spiral staircase sees a great number of repetitions of his own image from the front, from the back, and from both sides. Four or five persons standing together in the kaleidoscope appear as an innumerable crowd.

The following are considered the essential features of the invention :-

1. That the mirrors and passages are inclined to each other at an angle of 60° or at a multiple of 60°, the horizontal section of the individual compartments being composed of equilateral triangles.

2. That the mirrors and passages are all alike as regards their width and height, as well as the shape, size, and design or decoration of the frames or borders.

3. The kaleidoscope, which is accessible only from below, while the sides or walls are composed of large triangular mirrors, which form three adjoining sides of a regular tetrahedron, and are therefore placed to each other and to the floor at an angle of 60°.

The specification is accompanied by drawings.

THE PHOTOGRAPHIC YEAR.—In its record of the leading facts of progress made in photography since January, 1889, the *Photographic Times* calls attention to celluloid as a substitute for glass in photography, and as a material well suited for making focussing screens and other articles requiring great lightness and strength ; to magnesium for illuminating subjects by artificial light. "In development," it says, "hydrochinon has waxed and waned in popular esteem, and eikonogen has largely taken its place, especially among amateurs. Pyro continues to be largely used, however, by all classes of photographers. Lantern slides and photo-micrographs are being made in greater numbers than ever before, and the colour-sensitive plate is being more largely used. Dry plates have improved in quality during the past year." Our contemporary then goes on to note the increase in the number of photographic clubs, of amateur photographers, and of photographic instruction books ; and concludes by expressing the opinion that "the improvements made in photographic optics and the manufacture of cameras, tripods, and other apparatus, make it possible for photographic practical workers to do better work with greater facility than ever before. The outlook was never brighter for a new year."

Correspondence.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

SIR,—The Photographers' Benevolent Association is now so well and favourably known to most of your readers that I feel emboldened to ask space for this short communication.

The Association has, after a long struggle with the apathy of those whom it wished to benefit, at last become the recognised charitable centre of the profession. Its objects are already widely known, and during the sixteen years of its existence there has not been a single charge against the committee of unfairness or injustice in their awards. This the committee freely acknowledge is in a great measure due to the careful investigation which each case has received at the hands of the secretary, Mr H. Harland. Owing to the pressure of other business this gentleman is compelled to resign his position in February next, and the committee have, in consequence, to seek for a successor to him. This affords a favourable opportunity to replace a paid secretary by an honorary one, provided that a gentleman, either amateur or professional, can be found able and willing to devote a small portion of his time to the duties. It has been several times pointed out that the secretary's salary, small though it is, forms a serious item in the yearly balance sheet, and it is with the hope of being able to still further benefit their poorer brethren that the committee now appeal to the photographic community for a volunteer in this capacity. It may be mentioned that the duties are simple, and can easily be performed by anyone who has had any business experience.

The chairman of committee, Mr. W. Bedford, 326, Camden Road, N., will be pleased to furnish further particulars, list of committee, &c. *Pro* Committee P.B.A., E. CLIFTON.

REPRODUCTION AND COPYRIGHT.

SIR,—I read the first of the notes in your issue of December 13th with some astonishment. From it I conclude that in your opinion when a photographer has given permission to a certain newspaper to reproduce a photograph, he should henceforth consider the copyright, as far as this kind of reproduction is concerned, at the disposal of the newspaper to whom permission to copy has first been granted. Permission to reproduce photographs in newspapers and magazines is being made too cheap, and I think most photographers of experience will agree with me that the advertisement obtained from the average illustrated paper reproduction is not likely to give the photographer adequate repayment, save in exceptional cases, for the use of his copyright.

A late experience of mine of the wiles of illustration hunters may be of interest, and perhaps instructive to some of your readers.

A publishing firm wrote me requesting permission to produce a wood-cut from a photograph of mine for a magazine (specified, and sample copy sent) circulating, as was evident from its general character, among a class of people by whom it could not possibly be of any account to me whether my picture were seen or not, even if it had been well reproduced, which I knew from previous experience it would not be. My answer was that the photograph in question could be used as requested on payment of one guinea. This was agreed upon, a print of the photograph sent and the invoice ; but being somewhat more wary than the firm had evidently anticipated, I wrote on the invoice that permission to copy was granted *only for the particular paper specified*. This did not suit the publishers at all, and they wrote me to the effect that permission to reproduce could not be accepted under *conditions*. Thus, although the request had only been made for a specified paper of limited circulation, the intention was evidently to make indiscriminate use of my copyright for small consideration.

There is very exceptionally any encouragement to professional photographers to produce pictures except the love of it, and the expense is to many a very serious consideration ; and surely anything which makes the practice of art less burdensome to the pocket of the photographer should receive the support of the photographic press.

The experiences and opinions of others of your readers in this connection would be interesting.

There is also another matter which I should like to mention, and on which I believe there is considerable misconception. I have heard it stated by men one would expect to know, that a photograph must be registered *before* publication in order to make copyright securable; also that to mark a photograph copyright which has not been registered is a fraud. Now, as I understand the Act, copyright in a photograph *belongs* to the producer of such photograph, or to the person paying a valuable consideration for its production; and such owner of copyright can secure legal protection against infringement whenever he likes to register his copyright, but cannot obtain any compensation for infringement previous to registration. This is quite a different thing to total loss of copyright through neglect of registration previous to publication. I believe a clear and correct statement of the law in connection with such cases would be of immense value to photographers.

Rothill, December 30th. RALPH W. ROBINSON.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the technical meeting of this Society held on the 31st ult., the chair was occupied by Mr. ATKINSON.

Some photographs of groups of theatrical subjects, taken upon the stage with magnesium flash lamps, were exhibited by Mr. F. Downer, of Watford. In one of these groups there were whitish streaks, extending about a quarter of the distance from the sides towards the centre of the plate. He enquired the opinion of the members as to this appearance.

Mr. W. E. DEBENHAM suggested that they were probably due to the flashes shining upon the lens, and giving rise to what were called "ghost" images. When very bright artificial light was used, the camera ought to be shaded from such light by a hood.

Mr. CHAPMAN JONES thought that that was the probable explanation of the markings.

The CHAIRMAN showed a photograph of a family group taken with flash lamp. The picture was somewhat weak and flat.

Mr. L. WARNERKE thought that too much magnesium had been used. A very small quantity sufficed if it was thoroughly burned. When it was attempted to burn a large quantity, not only did some escape burning, but the duration of the flash was so long that movement on the part of the sitters became probable.

Mr. FRIESE GREEN had tried the magnesium flash lamp commercially for about three months, but had had to give it up. The pictures taken with it generally failed to give satisfaction to the sitters.

Mr. CHAPMAN JONES asked if there was any magnesium flash lamp that burned the metal quickly enough.

Mr. WARNERKE replied that there was, provided that only a small quantity was used.

Mr. CHAPMAN JONES enquired whether Mr. Warnerke had found it advantageous to dry the magnesium powder before using it.

Mr. WARNERKE replied that he dried it after purchase, and then preserved it in a bottle for use.

Mr. CHAPMAN JONES had found that a mixture of freshly-dried magnesium and chlorate of potash exploded with such rapidity that fourteen grains of it would shake the windows of the room in which it was used, but that after an hour or so it lost this power of extremely rapid combustion.

Mr. WARNERKE showed a lamp for burning magnesium ribbon, of which he had spoken at previous meetings. It was made in Berlin, by Ney, and had several points of novelty about it, the chief of which was the contrivance for automatically striking down the burned ribbon at short intervals. This action made a clicking sound, and as it was repeated at the rate of once for a little more than an inch of ribbon burned, it was practicable, by counting the clicks, to know and regulate the amount of magnesium used for the exposure. For copying purposes he held the lamp during about seven clicks, on each side of the picture. This equalised the lighting, and prevented irregularities in the surface of the picture from showing in the negative. The exposure he had mentioned, representing about fifteen inches of ribbon, was what he found to be right for copying an engraving half its real size when using a plate giving fifteen on the sensitometer, and a lens of the portable symmetrical character. There was a hood in front of the lamp furnished with a groove into which a ground glass could be fitted for ordinary work, and coloured glasses for orthochromatic work. He had come to the conclusion that for copying it was folly to use daylight. The certainty of exposure, as well as the convenience of lighting so as to obviate the irregularities of surface from showing, were advantages on the side of the magnesium lamp far outweighing the trifling expense attached to it. As to the smoke, the chimney belonging to the lamp could be contrived by a paper tube to any opening connected with the outer air. He had tried condensing chambers in which the fumes passed over a surface moist with acid, but they proved a failure.

Mr. DEBENHAM asked whether Mr. Warnerke had tried Meydenbauer's condensing chimney, in which the result was brought about by keeping the magnesia diluted with as little air as possible.

Mr. WARNERKE had not tried it. He then referred to eikonogen, which was in his opinion much better than any other developer that he had tried. He had worked one mixture for a whole week, developing a plate in it occasionally, and found it good to the last. He found caustic potash better than the carbonate. The formula used was a concentrated one as follows:—

Sulphite of soda	10 parts
Boiling distilled water	100 ,,
Eikonogen...	10 ,,
Caustic potash	10 ,,

The sulphite was first dissolved, then the eikonogen, and lastly the potash. It was filtered and bottled away whilst hot. For use he diluted with two or three parts of water if he wanted strong contrasts, and with from nine to ten for softer pictures. During his visit to the Paris Exhibition he had met with M. Maret, who was working on physiological subjects, where he only exposed for about the $\frac{1}{300}$ part of a second, using hydrokinone. On comparing with eikonogen, however, they found the power of the latter in bringing up detail to be very much greater.

Some photographs of large size (about 21 by 17) of American scenery by Jackson, taken direct, were shown by Mr. Friese Greene.

WEST LONDON PHOTOGRAPHIC SOCIETY.

ON the 27th December, a technical meeting of the above Society was held at the Addison Hall, Mr. C. GARNER RICHARDSON, M.A., occupying the chair. Mr. St. Clair Buxton, F.R.C.S., Mr. W. H. Whitear, and Mr. Miller were elected members.

The discussion upon Mr. Stein's paper on Hand Cameras was adjourned until the second meeting in January.

The SECRETARY (Mr. Hodges) informed the meeting that the annual exhibition would be held on the 10th January, at half-past seven, and would remain open on Saturday, 11th, from three to half-past nine. Mr. Mial, the inventor of the Facile Detective Camera, attended and explained its construction to the members.

In reply to the question, "Would the addition of sulphurous acid to the fixing bath have an injurious effect on the negative?"

Mr. STEIN said the effect would be to liberate sulphur, which would be prejudicial to the negatives.

Mr. HODGES thought it not advisable to add any acid to the fixing bath, and least of all sulphurous acid.

Mr. RICKFORD desired to know the proper quantity of magnesium ribbon to burn when reducing half-plate negatives to lantern size by reduction in the camera.

Mr. BENNETT had produced many slides in that way, and had found three to five feet necessary, and burnt about three inches behind the negative.

Mr. WINTER thought the amount excessive.

Mr. COBB showed some bromide prints which had been bleached by immersing in a solution of bichromate of potassium acidified with hydrochloric acid, and, after exposure to light, redeveloped with ferrous oxalate. The tones produced were warm brown.

Mr. HODGES said the degree of warmth would depend upon the amount of re-exposure given. Bromide prints would tone to a good brown with the ordinary uranium intensifier.

Mr. LESLIE SELBY recommended bleaching with mercury, and subsequent treatment with sulphite of soda, as advocated by Mr. A. R. Dresser.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

THE above Club held an exhibition on Monday, December 16th, consisting of members' work. There were six classes for competition, to which were contributed about 200 pictures, and 150 lantern slides. The judges were Messrs. S. Herbert Fry and Charles W. Hastings.

The following are the classes and prizes taken in each :—Class I.—(Landscapes in Silver, any size), first-class certificate, C. Beadle ; second ditto, J. W. Marchant ; hon. mention, W. T. Goodhew. Class II.—(Landscape in Platinum or Bromide, any size), first-class certificate, W. T. Goodhew : second ditto, C. Beadle ; hon. mention, Geo. R. Martin. Class III.—(Portrait, not less than four admitted to competition), first-class certificate, H. Beckett ; special class, formed by request of the judges (Figure Studies), first-class certificate, R. B. Lodge. Class V.—(Lantern Transparencies, not less than six admitted to competition), first-class certificate, C. Beadle ; second ditto, H. Walker. Class VI.—(Enlargements), first-class certificate to A. Le Vierge ; second, W. Sweeting. The "*Amateur Photographer* Bronze Medal" was awarded to Mr. W. T. Goodhew, for his picture of the waterfall in Battersea Park. In the evening there were two lantern displays, followed by vocal and instrumental music.

In the mounting of some of the exhibits, the prints were squeegeed into optical contact with the glass, leaving a considerable margin of clear glass round the edge, and then placed in the frames with a piece of plain oak a short distance from the glass.

The exhibition was to some extent marred by pictures being hung too high through insufficient room, as although the hall was capable of holding six hundred people, the available space was largely occupied by recesses and windows.

PHOTOGRAPHIC SOCIETY OF IRELAND.

A TECHNICAL meeting was held at the Society's rooms, 15, Dawson Street, Dublin, on Friday, December 20th, Mr. LOUIS MELDON in the chair.

Dr. COSGRAVE read some notes on Ilford lantern plates, relative to his experiments with those plates under varying periods of exposure to the light of an ordinary gas jet, the results obtained being exhibited at the same time through the lantern.

Dr. SCOTT showed in the same manner a set of these plates, some exposed to the light of a paraffin lamp, and some to that of magnesium wire, the developer being eikonogen with all. Very rapid results were obtained with the magnesium wire.

Mr. CONAN brought forward the subject of the construction of the dark room proposed to be fitted up on the Society's premises. An interesting discussion followed, in which many of the members took part.

The negatives taken during the excursion of the Society in September were handed round for inspection and criticism.

Eleven new members were elected, and seven proposed.

RECEIVED.—"Wintering on Lakes Le Arau and Marapouri" ; a Photographic Diary by Alfred H. Burton. Some of Mr. Burton's diaries have in past years been reproduced in the PHOTOGRAPHIC NEWS, and this, the latest account of his photographic experiences in opening up new country, reprinted from the *Otago Daily Times*, is of a very interesting character. At the end of the Diary is a catalogue of the views taken during Mr. Burton's trip.—Messrs. T. Fletcher & Co's., New Patent Calendar for 1890 is a combination of illustrated catalogue and calendar.

Answers to Correspondents.

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

All Communications, except advertisements, intended for publication, should be addressed to the Editor of the PHOTOGRAPHIC NEWS, 6, Furnival Street, London, E.C.

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

THE REV. F. C. LAMBERT writes to make a correction in his note on the "Champion Class," at page 113 of the YEAR-BOOK. The reader is requested to run his pen through the word *not* at the end of the fifteenth line, in the sentence, "Why should he (*not*) run again in another race."

S. T.—Your reference is at fault; the specification refers to a totally different matter. We have made another search without finding any record of a patent having been applied for in Great Britain.

W. L. (Java).—We have been to inspect the enlarging lantern at £6 6s. It is a thoroughly efficient instrument, with 5-inch compound condenser, and front combination lens fitted with rack and pinion, triple wick lamp (not quadruple), in Russian iron case, oak mounted, and all suitable for quarter-plate negatives; but if you wish to use it with your larger size, 7¼ by 4½, it will be necessary to begin by reducing them to appropriate dimensions, and then afterwards to amplify in this particular form of apparatus

BOSTON, U.S.A.—Calcium chloride in collodion. Since answering you on this point a fortnight ago, we have found a reference to the use of chloride of calcium for making a special chlorobromide collodion emulsion said to be used, when tinted with chlorophyll, for taking photographs of the sun. The statement occurs in Mr. Hermann Gunther's letter to the NEWS of Aug. 9th, 1889 (see page 525 of last volume), and is an ingredient of the collodion formula therein given as that of Dr. Zenger. Half a gramme of calcium chloride, and three and a quarter grammes of cadmium bromide, are used for salting the collodion.

A. M. M.—Great credit is due to you for the admirable summary of photographic literature which appears in the "Abstracts" given in the December number of the *Photographic Journal*. There will be, at times, some overlapping, for the paper on eikonogen by Prof. G. D. Liveing did not first appear in the journal to which reference was made.

H. B.—You can get the illustrated catalogue of the Paris Salon at the Slade School of Art Depôt, 137, Gower Street, W.C.

E. L., and GRAINED.—Read first Mr. W. K. Burton's "Manual of Collotype, Zincography, and Photo-mechanical Printing" (Marion and Co., Soho Square) ; you will then see what apparatus you require. The lithographic press and other items, such as rollers and ink, can be procured of Messrs. Hughes and Kimber, and Mr. Winstone, of Shoe Lane. You should not begin with 12 by 10 plates, but get experience with half-plate or cabinet size, and gradually work upwards when the technical difficulties are fairly mastered. We cannot refer you to any school of instruction.

J. M. G.—The round white spots on your silver print are evidently the result of some accidental splashes of acid, or of a corrosive metallic salt; but, when moistened with water and tested with blue litmus paper, we failed to get any indication of free acid, which may, however, have evaporated off meanwhile.

PRINTER.—A plough cutter, such as used by bookbinders and stationers, would answer your purpose. Enquire of Messrs. Waterlow and Sons, Limited, Finsbury Works, E.C. It is figured in their catalogue.

J. E. (Oxon).—The ether saturator can be procured of Mr. W. C. Hughes, 82, Mortimer Road, Kingsland, N.

W. GEORGE.—Every carbon print shows a slight relief when developed and dried. The degree of prominence will depend somewhat upon the character of the original negative, but upon applying to the Autotype Company, 74, New Oxford Street, your special requirements may be met by varying the amount of pigment or chemical quality of the tissue.

BAVON.—This question has often been asked of late. Only those who have been appointed photographers to the Queen, or to the Prince of Wales, have the right to use the Royal Arms. Such persons hold an official document, signed by the Comptroller of the Household, notifying their appointment.

Several other correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1636.—*January* 10, 1890.

CONTENTS.

BRITISH PHOTOGRAPHERS AND FOREIGN FORTIFICATIONS.

EXAMINATION of the periodical photographic literature of this country for many years past, proves that when London and some other British photographers have but a few days to spare, and wish to spend those three or four days on the Continent, Antwerp is selected as the place to visit in the great majority of cases. The reasons for this may readily be seen. A boat train leaves at night when the engagements of the day may be supposed to be over, and on board the boat a complete night's rest may be obtained; especially has it been so of late years, since the accommodation for passengers by this route has been so liberally improved. The daytime is thus left unbrokenly and on land at the disposal of the traveller. In addition to these advantages of that particular trip, Antwerp is a great city abounding in picturesque architectural food for the camera.

Short photographic excursions of the same kind to France are scarcely ever described in the photographic journals; yet Havre, like Antwerp, is a place which can be visited with a complete night's rest on board the boat, both in going and returning by the London and South Western route. A great impediment to short photographic excursions to any French port is, the uncertainty whether the holiday-seeker may not get into trouble by innocently taking pictures too near fortifications, for several cases have been published of late years of unpleasant treatment by French officials of perfectly harmless landscape photographers. Of course, on this side of the water we are liable to see but *ex parte* statements of each case, the aspects whereof might appear in a different light were the other side of the case put forth from a French source. Broadly speaking, it is a recognized fact that the average English are not popular on the Continent, and this arises chiefly from the offensive manners of a portion of our countrymen; perhaps some English photographers who have found themselves in trouble on the other side of the water, would have been better treated had they been decently affable.

Last Monday, when returning from more southern parts, we called upon some of the officials of the Photographic Club at Havre, and inquired whether the presence of the surrounding fortifications would cause the prohibition of out-door photographic work by any English photographers who might visit the city for a few days' holiday. They replied that nobody would interfere with their photographing inside Havre itself, and that they did not think that there would be any objection to their photographing along the beach, but would make inquiries on the subject. On the other side of the mouth of the Seine are the two pretty little seaside places of Trouville and Honfleur, and the time of reaching them from Havre by small passenger boats is three-quarters of an hour. They are good places for camera work, and especially is this the case with Trouville and its neighbourhood. Unfortunately, however, there is at present but one boat a day, with a few exceptions in the course of each month, to either place, and that boat does not start daily at the same hour; the service is a tidal one. A new pier is nearly completed at Trouville. It is said that when it is finished communication with Havre by small passenger boat will be kept up at regular hours, and several times a day. A good service of boats and trains between Havre, Trouville, Le Mans, and forking off at the latter place to Tours and Angers, would be a great boon to English tourists visiting the Loire district.

THE LAW OF COPYRIGHT.

SOME useful information about the law of copyright in relation to photographs, given this week in our correspondence columns, is of value because it comes from a legal source, Mr. Fleetwood Pritchard. The selling of a photographic print by its owner does not, it seems, prevent his copyrighting the picture at a subsequent date. We believe it to be the same with books. The whole subject of the law of copyright as applied to photographs is about to be taken up by the Photographic Section of the London Chamber of Commerce, when these and other technical points of interest to photographers will no doubt be well threshed out by experienced persons commercially interested in the subject, and whose deliberations will be fortified by authoritative legal advice from one or two members of the Section.

THE LATE COL. RUSSELL'S CONTRIBUTIONS TO PHOTOGRAPHY.*

BY PROFESSOR RAPHAEL MELDOLA, F.R.S., F.C.S.

In the coure of preparing a series of lectures on Photography, which I delivered at the Finsbury Technical College during the early part of the year 1888, I had occasion to search the literature of this subject, and was much interested to find how largely we are indebted for the advancement of modern photography to the work of our late member, Colonel Russell, of Stubbers, of whom an obituary notice has already been published in the *Essex Naturalist* (vol. i., p. 139). As an Essex worthy, whose merits as an investigator are so widely known, both in this country and on the Continent, it seems only a just tribute to his memory that his labours in the cause of science should find record in our pages. It is with this object that I have undertaken to give a brief sketch of his photographic contributions.

Before the introduction of the gelatine dry plates, which are now so generally used, the process invariably adopted by photographers was that in which the plate was first coated with a film of collodion containing a soluble iodide —or bromide and iodide—and then sensitised by immersion in a silver nitrate bath.

The collodion process was first suggested by a Frenchman (Legray) in 1850, but its practical working out is due to our own countrymen—Scott-Archer, Fry, and the late Dr. Hugh Diamond, in 1851.

There can be no doubt that the use of collodion marks one of the greatest epochs in the history of photography, and the method thus introduced for convenience of manipulation and certainty of results far transcended any of the older processes. But in these times of restless activity in every department of science, it is not likely that a process which possessed so many disadvantages should be allowed to rest without attempts being made to improve upon it or to supersede it.

The drawbacks to the old wet collodion process are familiar to all who have worked at it. The plate had to be coated, sensitized, exposed, and then developed as soon as possible after removal from the camera. In field work the dark tent had to be dragged about as a part of the necessary paraphernalia, and in addition to this and the camera the photographer was obliged to carry with him a stock of chemicals, such as bath solution, developer, fixing solution, &c., to say nothing of sometimes finding himself driven to extremities for want of a supply of clean water. The amateur of the present time lives in a golden age of photographic facilities; he knows nothing of the agony of learning to coat a glass plate with collodion with perfect uniformity and smoothness, using only a minimum of the viscid solution, performing the operation with the greatest possible speed, and returning the excess to the bottle without pouring it up his sleeve or over his boots. Who that has had to manipulate the collodion process under a tropical sun will forget the anxiety consequent upon the transport of bottles of ether into temperatures of something over 100° F. in the shade? I have vivid recollections of the Eclipse Expedition of 1875 to the island of Camorta, in the Bay of Bengal, somewhere about 8° from the equator. Our observations were to have been chiefly photographic, and we were well equipped with photographic materials. But the experience gained at home went only a little way towards helping us to manipulate collodion in a temperature at which the ether evaporated almost as soon as the film was spread over the plate. The tents had to be kept wetted with water, and the dark slide was brought out of the tent and fixed in its telescope camera swaddled in wet cloths to prevent the too rapid drying of the sensitive film.

These and other difficulties are now experiences of the past. At the present time a complete photographic equipment, weighing only a few pounds, can be taken into the field, and the plates or films developed at leisure any time after exposure. The sensitiveness of modern dry plates so far transcends that of the old collodion process that instantaneous effects can be secured by any amateur possessed of ordinary skill. It is desirable that Essex people should know what a large share the late Colonel Russell had in bringing about this state of affairs.

The most obvious way of getting rid of the difficulties of working the wet collodion process out of doors is, of course, to coat the plate with a dry sensitive film, which can be prepared some time before being actually required for use. Attempts were accordingly made to prepare sensitive dry plates soon after the introduction of the collodion process, the first important step in this direction having been made by Professor Taupenot, in 1855. This investigator coated his plates with ordinary iodized collodion, sensitized in a silver bath, washed out the excess of silver nitrate, and then coated with iodized albumen and dried. Before use the plates were sensitized by immersion in a silver acetate bath, and then washed and again allowed to dry. Taupenot's dry plates were the first successfully used by photographers, but they were very insensitive and uncertain in their action.

An improvement was introduced in 1858 by Fothergill, who used ordinary albumen instead of iodized albumen for coating the sensitized collodion film, thus doing away with the second sensitizing operation. Passing over certain minor modifications in the dry plate processes introduced by subsequent workers, we come to the year 1861, when Russell put the finishing touch to the method of collodion dry plate photography. The plate was first of all coated with gelatine as a substratum, and then received the film of bromo-iodized collodion, which was sensitized in a silver bath in the usual way. After washing out the silver nitrate the plate was coated with a solution of tannin and then dried. The tannin, known technically as a "preservative," restored the sensitiveness lost by the removal of the silver nitrate, and thus placed in the hands of photographers a really dependable dry plate possessed of greater sensitiveness and durability than any other dry plate known up to that time. Russell's tannin dry plates soon came into general use; his work on the process was published in 1861, and reached a second edition in 1866, both editions having been translated into German.

In these days of rapid photography, we should consider a tannin dry plate a very insensitive thing to work with, being at the best less sensitive than a good wet plate. But the other advantages of the dry plate outweighed this one disadvantage, and the favour with which the tannin process was received showed how eager photographers were to dispense with the cumbrous appliances of the wet plate method. From this discovery of Russell's to modern dry plate photography it is but a step, that step being the precipitation of the silver iodide or bromide in the collodion itself in the form of an emulsion, instead of coating the plate first with the salted collodion, and then forming

* A lecture delivered before the members of the Essex Field Club, and reported in the *Essex Naturalist*.

the sensitive silver salt by immersion in a silver nitrate bath. Emulsion photography is *par excellence* the photography of the present time, and there can be no doubt that the success of Russell's dry plates largely contributed to its introduction.

Important as was the advancement rendered possible by the use of tannin as a preservative, this is by no means the only noteworthy photographic achievement with which our late member must be credited. Only a year after the introduction of his dry plate method, Col. (then Major) Russell made known the use of ammoniacal solution of pyrogallol (pyrogallic acid) as a developing agent, a discovery which marks a distinct epoch in the history of the art, and of which the practical utility makes itself felt at the present time. Prior to the year 1862, the developers in use by photographers were of an acid character. Gallic acid mixed with silver nitrate had been used by Fox Talbot for developing his paper prints as far back as 1840. Pyrogallol was known to be a more powerful developer than gallic acid both by Liebig and Regnault in 1851. The use of ferrous sulphate, the active substance in the "iron developer" of the old collodion process, was known to the late Robert Hunt in 1844. When dry plates first came into vogue, acid development had to be resorted to as the only known method of bringing into visible existence the invisible image formed by the action of light on the photographic plate.

For certain chemical reasons, which need not be entered upon in detail here, an acid developer is eminently unsuited for dry-plate work. The early experimenters in this field were not only at a disadvantage as regards the comparative insensitiveness of their plates, but this slowness of action could not be compensated for by using a stronger developer, because the free silver nitrate, which is an essential constituent of an acid developer, would be reduced, and metallic silver deposited all over the film; that is to say, the plate would become fogged. It is, of course, impossible to trace the precise origin of the idea which led to the use of alkaline pyrogallate. It appears that experiments had been made by Anthony, of New York, in 1862, having for their object the increased sensitiveness of dry plates by exposing them to ammonia vapour before use, and about the same time Glover attempted to increase the sensitiveness by the action of ammonia vapour after exposure and prior to development. Whether Colonel Russell was aware of these experiments there are at present no means of ascertaining, but it is not improbable that his attention may have been directed thereby to the use of ammonia. The fact that dry plates could be developed by means of a neutral solution of pyrogallol without free silver nitrate was made known by Mudd, Wardley, and Wharton Simpson in 1861. All the conditions for the introduction of alkaline development were therefore ripe, and the important discovery was announced by Russell in 1862, and about the same time, but independently, by Leahy. The importance of alkaline development is too well known to photographers to require specially enlarging upon. It will suffice to say that the powerful developer given to the world by our late member put dry-plate photography on an entirely new basis. Want of sensitiveness could be overcome by increased developing power; in fact, the reducing action of ammonium pyrogallate is so great that it tends to fog the plate unless restrained by suitable means. In connection with the general theory of the development of the photographic image, this discovery was of the highest order of importance, and its bearings were fully recognised by Col. Russell. In the old process of acid development, the image is built up by the deposition of metallic silver from the developing solution, whereas in alkaline development the image is formed chiefly out of the silver reduced in the film itself. For the full establishment of this most essential distinction between the two kinds of development we are also indebted to our late member. In the course of a controversy carried on in 1865 with Carey Lea, of Philadelphia, Russell proved his point most convincingly by a beautifully devised experiment. He showed that if an ordinary collodion negative after development is treated with nitric acid, the whole of the picture is dissolved off, and the plain film left in its original condition; the silver image is here simply raised in relief upon the surface of the film, and the acid dissolves it off. He then showed that a negative dry plate developed by the alkaline method, and treated with nitric acid as before, gave a transparent positive of the picture sunk in depression; the silver image is in this case imbedded in the film instead of being raised upon its surface, and the acid accordingly dissolves it out, leaving its counterpart in depression. This proof not only convinced Russell's antagonist and the photographic world at large of the truth of his views, but the experiments led to that which is dear to all Englishmen, and which is, in the minds of many, the only true measure of success, viz., a practical result. He published the details of a method in 1868, based on the foregoing experiments, by means of which a reversed negative, or a transparent positive, could be obtained from a dry-plate negative by treatment with nitric acid after alkaline development and before fixing. This process is now obsolete, but it has its historical interest, as being the outcome of a theoretical discussion.

The value of Col. Russell's introduction of alkaline development in 1862 does not, however, end with his own application of the process to the dry plates then in vogue. The germ of the discovery which has revolutionized modern photography was in existence in 1864, when Bolton and Sayce made known their collodion emulsion process, which was followed up by many workers, and culminated in the introduction of gelatino-bromide emulsion by Dr. Maddox in 1871. From that time emulsion processes have steadily been gaining favour, and now are almost exclusively in use. From the very beginning of their history, in 1864, these processes had therefore the benefit of Russell's method of alkaline development, by which, or by some analogous plan—such as the ferrous oxalate developer—are they only workable. It will thus be seen that the influence of our late member's work makes itself felt, as was stated previously, at the present time. Whether Col. Russell continued his photographic work in later times I have not been able to ascertain, but his name does not occur among the more recent investigators in this department of applied science. It is possible that the few years during which he occupied himself with photography represented but a passing phase of the many-sided pursuits to which he was attached. That he has left a permanent mark in this field will be gathered from the present sketch, and the genial naturalist and ardent sportsman must certainly take rank among Essex worthies as an original investigator in a department of science widely remote from those other pursuits by which he is, perhaps, more generally known to the members of the Essex Field Club.

THE number of the English eikonogen patent is stated to be 5207, March 26th, 1889.

REPAIRING BROKEN NEGATIVES.*

BY HUGH BREBNER.

THE operation of mending broken negatives so that the lines of junction will barely be visible, and will scarcely show in the print, is one requiring at once time, good daylight, carefully arranged paraphernalia, and a sure and skilful hand.

Before proceeding to work, I should like to draw attention to, and to emphasise the fact that when an ordinary negative is broken, and the bits of glass are pieced together, the print will show a harsh black and white line at every junction, or if printed while revolving, the desirable loss in sharpness will be disagreeably counterbalanced by a painful gain in the breadth of the "fuzzy" line.

Dry plates to-day are so much more reliable and perfect than they used to be, and our familiarity with their treatment so great, that the stripping of a film, even from a surface prepared to hold the gelatine firmly, presents no difficulties which a very little care and skill cannot overcome. The subsequent replacing of the pieces of the broken film upon a fresh piece of glass, and the method whereby the edges of the gelatine shall be brought together so that the direction of the fracture can with difficulty be detected in the print, and can very easily be touched away, are the points upon which I have more particularly to dwell.

The denser the image, the less will the line of junction show; and, when the mending is at all skilfully effected, a soft, thin line on the most transparent portions will be the only trace. Landscapes, also groups and vignettes, are less liable, for the same reason, to exhibit traces of the mended line, than are plain or cameo heads. If, however, it be important that no line be at all visible, all sign of inequality of tint—beyond that characterising the picture—may be got rid of without much difficulty, and with considerable certainty.

If the negative has been modelled and varnished before being broken, the varnish must, of course, be removed with methylated spirit in the usual way, and it is perhaps better to treat even an unvarnished (broken) negative to a preliminary bath of spirit, or, in its place, alum may be used, as this toughens the film and prevents extreme expansion. Having carefully preserved each chip, examine each for tiny splinters of broken glass, and when found remove them. Lay the chips, well separated from each other, to prevent further chipping, in a large, flat bath full of acidulated water (HCl). After some time, by preference just when frilling begins at the broken edges, take out chip after chip, and successively plunge each under water in another bath, and drag the fingers against the broken edges upwards and backwards till the margin of the film is loosened on two edges of the chips—whether triangular or lozenge-shaped. Then, with only a slight modification of the action of the fingers, fold back the film upon itself, and with repeated touches free it entirely from the glass. It will be found that this can very easily be done where the cut is clean, and where the film is of equal thickness. It is a very much more difficult operation if the attempt be made to begin upon the original margin of the plate. Throw away the bits of glass, or piece them together somewhere else as a guide. Throw each film as it is detached into a vessel of gently moving water, so that the films may expand equally. Immerse the films in pure methylated spirit to shrink the expanded film, and thereby recover density.

Have ready a clean piece of glass, and, having lifted out the largest piece of film as wet as possible, throw it down on the glass and rapidly spread it out, right side up, in the place it should occupy. Now, holding the film in its place at the edge, incline the glass so that the superfluous moisture may flow off, when the film will adhere to the glass of its own accord. Next, pick out a piece of film which fits the first, treat it as the last, and bring it roughly into position. Do the same with the remainder of the pieces. Place the glass on a modelling-desk, and, with a large, soft brush, moisten piece after piece; drag each into closer juxtaposition with the piece above it; and when the edges just overlap and nothing more, partially dry the brush, and drag the point or heel along the two edges. This will cause them to adhere more firmly to the glass, and prevent the tendency to slip down. It is much better to have a slight overlap than to have an exact meeting of the edges at first, or to leave a gap between, and for the following reason: as the films dry they contract, each towards its own centre; consequently the edges of neighbouring pieces are dragged away from each other, and unless some allowance is made for this, it is difficult to bring them exactly together ultimately. When the films are very nearly dry take a smaller brush, and with its heel drag gently along the finer junctions. In most cases this will be sufficient to bring the edges into simple contact without any overlap. Where the overlap is more marked, wet the brush, and with it moisten the two films slightly near, and at that part of their edges. When the gelatine is moist enough it becomes pliable, and contracts or expands at the slightest touch of the brush. If the film be too moist it will be too elastic, and will regain its former position the moment the controlling pressure is withdrawn. If, on the other hand, it be too dry, it will not budge one jot from its place. Therefore the simplest way to bring the edges loosely together without overlapping is to moisten the film, pretty freely at first, from an eighth to a quarter of an inch from the edge, and with the heel of the dry brush to drag it towards the centre, and at the same time by withdrawing the moisture cause the film to adhere to the glass in the desired position. The final touch to each junction should be a soft, dry scrape along the crack.

If the last operation has been performed perfectly and with sufficient judgment, the negative when dry will be ready to print from, or to intensify. But it is seldom—except in the case of very simple fractures—that no overlap or gap is visible when the film is hard-dry. Consequently a final treatment is generally necessitated. This varies: with an overlap, no matter how thin, a white line will result in the print; therefore the edges must be again moistened and dragged asunder. But with a gap, which would print as a black line, the piece of the film should be moistened at first near the centre, and then gradually towards the edge, and when amenable to expansion, dragged or stretched gently with a dry brush away from the centre towards the edge. Should the gap be wide, it may be necessary to work on two pieces of film, but in all cases the drawing of the picture should determine which piece should be moved, and in what direction. The best position of the edges of the moist films when the centres are dry is that of an inverted V, thus Λ: when the edges take this shape they had better not be pressed flat, unless they are very nearly dry indeed. Blisters caused by air-bells may be led from under the surface with a wet brush.

* Abstract of a paper read at a meeting of the Edinburgh Photographic Society.

This is a rough skeleton outline of the operations most commonly required, but occasionally the negative is too thin; sometimes an edge gets broken, and now and again a piece gets lost. As the application of an aqueous solution of mercuric chloride would simply cause all the pieces of film to float off, the mended negative should receive a coating of quickly setting gelatine before being intensified, or the broken negative itself might be slightly intensified before stripping. Where the edges are broken or frayed, the remedy is a touch of gelatine and a few strokes of the modelling pencil. When pieces are lost the same treatment may be adopted, but I have personally found it preferable to cut out a piece of another negative—worthless otherwise—of the same shape, but somewhat smaller than the space to be filled, and then fit it in after soaking it. Where a very faint bright line marks the junction of the films, the raised portion of the negative may easily be pared down with a sharp lancet or round-pointed knife blade. When this is overdone the modelling pencil again comes into requisition.

In conclusion, I may add that I have only once failed to make a very passable bit of work of any mending I have undertaken, and on that occasion the fracture took the form of a glittering star, and the number of pieces was exactly fifty-two.

THE PROGRESS OF QUINOL DEVELOPMENT.*

BY ALFRED MASKELL.

IN conclusion, I may say that it would appear that we have not yet come to the end of newly-proposed developers. New re-agents will, in all probability, continue for a considerable time to be brought forward; unless—and this perhaps is not beyond the bounds of probability—the time should arrive when the sensitive plate is impressed in the camera and requires only to be rendered permanent; going back, in fact, to some extent to earlier methods. For myself I would wish for a truce. I should consider it as a relief that things for a time might remain as they are; no new discoveries in the shape of developers, printing methods, detective cameras, and so on. Then we might apply ourselves seriously and with greater calmness to the means we have at present at our disposal—which are great indeed—and perfect some systems which have been neglected. I dread the arrival of the automatic penny photographic machine, which it is promised we are soon to see at all the railway stations. I am not pleased as a rule with the discovery of any new device for saving time and trouble, and I do not look forward to the time when photography will become such an easy process that any child may work it. I believe that in our art, as in all other arts of the best periods, the finest results are to be produced when time is considered as no object. In it, as in all arts, machinery and automatic appliances encourage the production of shoddy and clap-trap imitation. I will scarcely hesitate to say, in fact, that I would gladly almost go back to the days of Daguerreotype: had not one discovery followed so fast on the heels of another, it is possible, indeed, that that process, beautiful as it was, admirable for the very defect in some eyes of producing only one copy of a picture, and for certain subjects never since surpassed, it is possible, I think, that the Daguerreotype might have been so modified and improved in the method of working as to have held still at the present day a higher place in the public favour than it holds now as an almost forgotten process; remembered more with a kind of reverence than for the results it is capable of producing. It is, then, almost against the grain that I have to advocate what is, to a certain extent, akin to the automatism which I am more inclined to deprecate. It is necessary, however, to march with the times, and while I think the evil of our too rapid progress is manifest and unavoidable, the very evil itself is productive of good by the inducements it holds out for thousands to the study of practical art which they would otherwise not undertake. Of these the feeble and insincere will fall out of the race, or at least will remain unnoticed, heroes only to their immediate circle; a few will come to the front to illustrate the page of photographic history.

* Concluded from page 12.

FORMULÆ.

Paris Photo. Club.—Boil a litre distilled water; put equally divided into two litre bottles; while warm, put into one 75 grammes sulphite of soda, in the other 150 grammes sodium carbonate, powdered immediately before using. Shake till dissolved. To the sodium sulphite solution add 10 grammes quinol, and shake well till dissolved; to this add 8 to 10 drops acetic acid crystallised. Leave all to cool. When cold, mix by pouring rapidly the quinol solution into the carbonate, and filter the whole into a third litre bottle. The solution should be perfectly clear.

For Instantaneous Work:—

Concentrated solution of sod. carb. (pure)...	300 c.c.
Concentrated solution of sod. sulph. (pure)...	150 ,,
10 per cent. alcoholic solution of quinol ...	50 ,,
Rain or distilled water	500 ,,

Mr. Swan's:—

A.—Quinol	80 grains
Citric acid	10 ,,
Sod. sulph.	80 ,,
Distilled water	20 ounces
B.—Caustic potash...	160 grains
Sod. sulph.	160 ,,
Distilled water	20 ounces
C.—Bromide pot.	24 grains
Distilled water	1 ounce
D.—Caustic potash	160 grains
Distilled water	20 ounces

For normal exposures use equal parts of A and B, adding 5 minims of C for every ounce of solution. For over-exposed plates use D instead of B, with an extra quantity of C. For under-exposed plates omit C, and, in extreme cases, add 6 or 8 grains more of sulphite to every ounce of developer.

Dr. Vogel:—

Quinol...	5 grammes
Sodium carb.	75 ,,
Sodium sulph....	40 ,,
Water	900 c.c.

or carbonate of potash 75 grammes instead of carb. soda. Addition of about 5 per cent. of a 40 per cent. solution of caustic potash shortly before developing accelerates better than applying pure caustic potash

With Metabisulphite of Potassium as Preservative:—

A.—Quinol	10 parts
Metabisulphite	4 ,,
Water	250 ,,
C.—Caustic soda	50 ,,
Water	500 ,,

For every 100 parts of water take 10 parts A and 10 parts B.

Concentrated Solution:—

Quinol	1 gramme
Citric acid	5 decigrammes
Sodium sulph.	1 grammes
Water to make	100 c.c.

Five c.c. of this contain 1 decigramme of quinol.

With Acetatate of Soda :—

A.—Quinol	...	...	...	10 parts
Metabisulphite	...	...	...	4 ,,
Water	...	...	...	250 ,,
B.—Sodium acetate	...	...	...	50 ,,
Water	...	...	...	400 ,,

As a Further Accelerator :—

Sod. acetate	...	...	...	5 parts
Water	...	...	...	40 ,,

For Bromide Paper :—

(Thomas) A.—Sodium carb.	...	...		60 grains
Water	...	...		1 ounce
B.—Quinol	...	...		12 grains
Sod. sulph...	...	...		60 ,,
Water	...	...		1 ounce

Mix equal parts, and add the same quantity of water ; or better, use hintokinone 1 to 12 of water. Alum bath is good ; no acid bath.

Mr. Victor Corbould's Method of Producing Warm Tones in Lantern Slides.—Make up your normal quinol developer, and having previously *over-exposed* your plate, develop until the image just appears ; then immerse in a solution of caustic potash 5 grains, water 2 ounces, when the image will come up quickly, but will not be too dense. The colour obtained by over-exposing about six times the normal exposure with Thomas's plates is a warm sepia.

GENERAL NOTES.

Contrary to early instructions, it is advisable to rock the bath during development.

Mr. De St. Priest says that with a bath three times as diluted as the ordinary formula, the time of exposure may be shorter than with a more concentrated bath, the development being, however, slower.

From time to time take the plate out of the developer and leave development to proceed for a minute or so ; the action is more rapid.

For yellow stain, try, after fixing, washing, and drying, a bath of water 100 c.c., hypo 10 to 20 grammes, alum 5 grammes, hydrochloric acid or gallic acid 2 to 5 c.c. Let stand and filter.

In using quinol with carbonate of potash or soda, the colour, says Dr. Vogel, is considerably influenced. This depends on the quantity and kind of salt added. With the formula, sulph. sod. 40 grammes, quinol 5 grammes, carbonate of soda 50 to 150 grammes, water 900 c.c., green pictures result up to 75 grammes carb. sod. ; tone gradually improves to black as more is added. Carbonate of potash does not give green tones.

The method of soaking plate in quinol solution for one minute, taking out and completing the development in the alkali solution, is recommended. Once set going, plates can be passed on from dish to dish, saving time with large batches. The soda solution should always be used with a portion of already used bath.

Papier-maché trays should be kept clean and full of water, otherwise the action of the developing solution breaks up and dissolves the surface. If left in glass measures, funnels, &c., to dry, it causes a hard deposit ; leave them full of water with a drop or two of hydrochloric acid. The hypo bath, if exposed to air for any length of time, throws down a thick, muddy deposit if plates are not washed between development and fixing.

With chloride plates a small quantity of bromide of ammonium or potassium is advisable, the action on these plates being very energetic, and liable to cause fog.

For yellow fog, sometimes produced by accidentally leaving a negative in developer for a very long time, put, after fixing and washing, into a bath of

Sol. of red prussiate of potash ...	½ per cent.	1 part
Sol. of hypo.	10 per cent.	1 ,,

Mix at time of using only, and use in subdued daylight.

"A1," for January contains an article on "Photography," by Walter E. Woodbury, in which, among the illustrations, are two designed to show, respectively, the difference between a photographer's impedimenta now, and years ago.

PHOTOGRAPHING LIGHTNING.

IN our issue of July 26th, we printed a paper entitled "Instructions for Taking Photographs of Lightning," read at a meeting of the Photographic Club by Mr. William Marriott. We give now some extracts from a communication by the same writer, taken from the *Quarterly Journal of the Royal Meteorological Society* for October. Speaking of the storm which passed over London on June 6th, Mr. Marriott says :—

The storm was remarkable for the brilliant and continuous display of lightning, and was without doubt the grandest storm that has been witnessed in the metropolis for many years. Occurring just after sunset, the conditions were very favourable for carefully watching the storm and for photographs to be taken of the lightning.

One of the most remarkable features of the storm was the persistent and repeating character of the lightning. Many of the flashes appeared to remain visible for a perceptible length of time, some people being able to count 6, 7, 8, and even 10 before the flash disappeared. There were numerous instances in which the lightning appeared to repeat itself three, four, or more times. It is probable that these were distinct flashes following precisely the same path. This supposition is confirmed by some of the photographs of lightning which were taken during the storm. Mr. Nimmies, of Balham, obtained two photographs, each with four distinct flashes following precisely the same path and sinuosities, and only separated from each other by a very small amount of space. These appeared at the time to Mr. Nimmies as one flash. Fortunately the photographic views include some railway signals, and an examination of these reveals the fact that there are four distinct images of the signals. The space between the images of the signals agrees precisely with the space between the flashes of lightning. As the camera was held in the hand and not clamped to a tripod, it is clear that the camera was moved slightly during the exposure, and what appeared to the eye as one flash was in reality a succession of four flashes. A similar repetition of flashes is shown on several other photographs, and in each case the camera was held in the hand.

A most interesting photograph was taken by Dr. Hoffert at Ealing. This was obtained while the camera was being swayed to and fro. It shows three similar parallel flashes which took place during the movement of the camera in one direction. The space between the flashes is traversed by faint bands of light parallel to the direction of motion, which appear to indicate the existence of a residual illumination of a phosphorescent character in the intervals between the successive flashes. A second series of three flashes is shown in the upper part of the photograph, as well as a dark flash ; while a third series of two flashes, but with a wider interval between them, is also shown on the plate.

Some photographs showing flashes like a broad band or curtain of light were also obtained during this storm ; but in each case it has been ascertained that the camera was either held in the hand or not securely fixed. These seem all to lead to the conclusion that a lightning flash is not instantaneous, but has a much longer duration than has generally been supposed to be the case.

Three or four photographs showing dark flashes were obtained during this storm, the most notable being those taken by the Rev. A. Rose, at Emanuel College, Cambridge, and by Mr. A. W. Clayden, at Tulse Hill, London. The latter gentleman has since made a number of experiments in photographing the sparks from an electric machine, which tend to show that the dark flashes were due to photographic reversal.

In the discussion which followed the reading of the paper, the following expressions of experience and opinion were elicited :—

The President (Dr. Marcet) remarked that Mr. Wimshurst had photographed the sparks from his electric machine while the photographic plate in his camera was revolving between 3,000 and 4,000 times per minute, and had obtained a sharp image

of the spark. Mr. Wimshurst believed from these experiments that no movement of the camera during the process of photographing a flash of lightning could in any way fog or blur the image.

Mr. Whipple said he had attributed the double images shown in the lightning photographs previously received by the Society to the fact that the cameras had been exposed behind a window. He had made experiments which had tended to confirm his supposition, having drawn chalk lines upon a blackboard and photographed them at various angles through plate-glass. The photographs obtained exhibited very similar appearances to those shown in the lightning photographs. The dark flashes, too, had appeared to him to be due to internal reflection, but on this point he had been unable to make experiments. In the present series of photographs both the dark and ribbon flashes were shown; and in the case of the ribbon flashes he felt compelled to abandon his idea of their being the effect of refraction through a window, as both Dr. Hoffert's and Mr. Shepherd's pictures, in which latter a flash was splendidly doubled, were taken without the intervention of a window between the camera and the flash. It was exceedingly difficult to reconcile these lightning photographs with Mr. Wimshurst's photographs of the electric spark, especially supposing the flash lasted so short a time as it was usually stated. It certainly seemed that lightning flashes, instead of being so rapid in their movement, were very persistent. In the storm on June 6th he distinctly saw a beaded flash, and, like Dr. Tripe, he found himself much better able to follow the course of the lightning than he had been hitherto, because his eyes had now become educated, and he knew what to look for.

Dr. Hoffert said that in one case he noticed the lightning had a distinct fluttering appearance, showing that the lightning was sufficiently slow to make its movements apparent. He did not think that Mr. Wimshurst's photographs of electric sparks could be taken as an analogy, as the conditions in nature were so different. It was difficult to understand that any oscillation of the flash could have taken place, as the forms of the flashes in the photograph taken by himself were similar. He was unable to explain the dark flash, but from experiments he had made he had been led to believe that the phenomenon was not due to excess of exposure.

Dr. Green suggested that the dark flashes in the photographs were produced by yellow flashes, as intense yellow gave a negative effect.

Mr. Ranyard said: If we assume the ribbon flashes to have a real existence, the photographs seem to show that the ribbon never curls or turns to one side; all the turns are made so that the cross lines of the ribbon remain parallel to a fixed line. It follows from this that each edge of the ribbon is a plane curve, and the ribbon always remains between two parallel planes. A ribbon flash seen from any point between these planes would appear to project into a straight ribbon. Mr. Marriott and he had wished to determine whether there was any connection between the direction of the wind and the cross lines of the ribbon, or whether the cross lines were parallel to some fixed line in space, such as the earth's magnetic axis. He had therefore tried to observe the curvature of the lightning flashes seen in different directions during the great storm, but he had not been able to recognize any direction in which they appeared to be all straight flashes, and he had not seen any ribbon flashes or dark flashes. When he came to see the photographs taken during the great storm, his faith as to the real existence of ribbon flashes was still further shaken. There were some photographs which showed three or four parallel flashes of lightning, and three or four separate images of a railway signal post lit up by the lightning, proving that the plate must have shifted between the flashes, which were absolutely alike, turn for turn. The images of the signal post were separated by distances which corresponded with the distances between the lightning flashes, and we must consequently assume that the three lightning flashes all followed the same course in the air. This is what might theoretically be expected, for the first flash would heat the air and form a path of least resistance which subsequent flashes would travel along, as water follows the turns of a pipe. A somewhat similar photograph had been taken by Dr. Hoffert, who had intentionally moved his camera from side to side, proving that recurrent flashes occupied a considerable portion of a second, and that between each flash there was a phosphorescence which left a trace on the plate very similar to the gauge-like traces with which we were already familiar in the ribbon flash photographs. It was a very significant fact that all the photographs of ribbon flashes, as far as he was aware, had been taken with cameras held in the hands, or, at all events, with cameras which were not screwed to a fixed support, but were only held against a window-sill by the hand of the operator. And he thought that we have in these photographs evidence of the nervous condition of the operator, and of the magnitude of the jump or start which the flash gave rise to. Dr. Hoffert's photograph, as well as the other photographs of multiple flashes, showed that all the flashes took place in the same direction, for all the flashes thinned out in the same direction. There was no evidence of lightning striking first backwards and then forwards, as had been suggested.

PHOTOGRAPHY IN FRANCE.

BY LÉON VIDAL.

JUBILEE BANQUET—MUTUAL AID ASSOCIATION—ISOCHROMATIC PLATES—FLASH TORCH—MICRO-PHOTOGRAPHS—MONOCHROMATIC LIGHT—PHOTOGRAPHIC GUN—COLOURATION OF NEGATIVES—BIBLIOGRAPHY.

Second Banquet of the Fiftieth Anniversary of Photography.—A fête, commemorative of the invention of photography, took place on the 16th of last month under the auspices of the Syndical Chamber of Photography. The idea was to give to those persons prevented from attending the banquet on the 19th of August, the opportunity of taking part in a manifestation organised with the same view. The fête, which was particularly attended by professional photographers, was of the most cordial character. The President of the banquet, in drinking to the fraternal and solid union of photographic corporations, explained the necessity for creating amongst the whole of photographers an association of mutual aid, which would come to the help of unfortunate members or of their widows and children. The appeal of Léon Vidal was taken up, and generous offers were spontaneously made. The association was created, and on its foundation it is necessary to constitute itself formally by adoption of statutes of association. The invested funds are to be permanently inalienable, pensions and other aid being taken only from the revenues. The annual subscription is fixed at six francs, and perpetual membership—that is to say, freedom from any subsequent contribution, at 100 francs. The association includes foreign as well as French photographers. This useful work was wanting to the photographic body, and it is a good thing to have filled up the gap. The sitting of the French Photographic Society of the 3rd inst. presented nothing of great interest. Below we sum up the principal events.

Edwards's Isochromatic Plates.—The photographs from these plates, accompanied by those obtained on ordinary plates, were defective as examples from a cause which was pointed out. The impression prevailed that the ordinary plate had been taken in a bad light, whilst the isochromatic photograph is better, being more directly lighted. We are not ignorant of the difference shown by two reproductions, one of which is taken upon an ordinary, and the other on an isochromatic plate; but we like, when the two results are produced together, that they should possess a character of ingenuousness such that the observations called forth by Mr. Edwards's proofs could not be made.

M. Attout Tailfer, who, according to his own statement, has better formulæ than others for isochromatising plates, endeavoured to demonstrate that the proofs communicated had been reproduced under identical conditions; but he did not succeed in convincing anyone. It is time to have done with the myth of pretended patents relating to isochromatic preparations, and it appears to us to carry simplicity and complaisance to excess for persons to tell us that certain patents prevent them from practising orthochromatic photography. The truth is that this method belongs to all the infinite variety of colouring products, of coloured screens, and of processes and formulæ capable of leading to the same result, and it is no more in the power of a commercialist to place himself as a barrier against the application of orthochromatism, than it is in the power of a colour-merchant to prevent a painter from using red or any other colour. Such commercial pretensions are of an unworthy stamp, and based upon the ignorance of the greater number, and the timidity of the few. It is time, we repeat, to have done with such trammels to the progress of photography.

Flash-Torch for Producing the Magnesium Flash.—This little apparatus, conceived by MM. Merville and Lausiaux, looks exactly like one of those fuse boxes which smokers use for lighting their cigars. It consists of a metal reservoir of the size of a small match-box. On this reservoir are two small tubes, one to take a rubber pipe connected with an elastic ball, the other receives a blazing match. The air and the magnesium powder, projected by the rubber ball, come out enveloping the blazing torch, and the magnesium flash is thus produced. The little box in question will contain twelve charges—that is to say, enough pure magnesium for twelve flashes. Simple and exceedingly portable, this little apparatus is destined to be a success.

Micro-photographs of Wood Sections.—A very interesting communication on this subject was made by MM. Thil and Thouronde. Micro-photographs, to the number of about 400, were executed to the order of the Minister of Agriculture. Mons. Thil, Inspector of Government Forests, has, in very precise language, pointed out the reach of this application of photography, which permits of the classification of woods in families and species, thanks to the comparison alone of the intimate structure of the fibres and cellular network. By this means we are enabled, with the help of simply thin cuttings, to give, so to say, a complete anatomy of each species, and to notice easily the essential differences which exist between wood of different species, although belonging to the same family; all the more, therefore, can we recognise classification in families. Micro-photographic pictures, projected by the lantern, served to demonstrate clearly the truth of the propositions affirmed. This is a new example, and one of the most conclusive kind, of the numerous services that photography may render to the sciences. This considerable work does the more honour to Mons. Thouronde that his preliminary studies of micro-photography naturally indicated him to the choice of the Minister in view of the present important application.

Baths for Holding Liquids for Mono-Chromatising Light.—It is to Mons. Thouronde that is due a presentation of these baths formed of two sheets of glass and a third with a round aperture; against this the outer plates are cemented, a small hole being left for the introduction of coloured liquid, sulphate of copper, or whatever it may be. The advantage presented by this arrangement is that of giving dishes with vertical sides, very sound, and convenient to use. There is no danger of any injury to the instruments from the escape of a liquid which is often injurious to them.

Hand Apparatus.—Photographic Gun.—Mons. Carette described the action of this little apparatus, which we had already seen at the Universal Exhibition. It is essentially a small camera mounted on a handle like the stock of a pistol, the exposure being made by pulling the trigger. It is also fitted with two short telescopic legs in front, by means of which it may be used standing on a table or other support, and levelled if need be. This well-schemed instrument must be added to the collection, already so numerous, of photographic *vade-mecum*.

Yellow Colouration of Negatives.—Mons. Hervè, who had not clearly understood what M. Balagny had desired to express at the previous sitting of the Society, delivered a long dissertation upon the yellowing of gelatine plates in pyrogallic acid. The misfortune was that he had missed the point of the question, and that an hour was lost from his not having listened. Mons. Balagny replied that he only spoke of the canary yellow veil which is produced on plates after their immersion in hyposulphite of soda. He stated afresh that the preliminary washing of the negative in water acidulated with citric acid constitutes a preventive means, permitting us to avoid with certainly all yellow veil. We think for our own part that all that is necessary is washing with plain water; a negative sufficiently washed is freed from all trace of alkaline salts, carbonate of soda or of potash, and remains clear and without the slightest colouration. When the development has been long we must insist more strongly still upon thorough washing, in order to better penetrate the film of gelatine which has been more deeply impregnated with alkaline salts.

Bibliography.—MM. Gauthier-Villars and Son have just brought out a treatise on photography with pellicular processes by Mons. G. Balagny. This work includes two vols. The first is dedicated to generalities—flexible films, theory and practice of the three developments, iron, pyrogallic acid, and hydroquinone. The second includes pellicular papers, the general application of pellicular processes, phototype, contretype, and transparencies. There are in this work many things pointed out which it is useful to consult.

HASTINGS AND ST. LEONARD'S PHOTOGRAPHIC SOCIETY.—The annual general meeting will be held January 13, in the large room of the Brassey Institute, when Mr. A. R. Dresser will give a paper, with illustrations by lime light. An exhibition of photographs, lantern slides, transparencies, photographic appliances, and apparatus, will be held in the Public Hall, Hastings, on February 25th, 26th, and 27th. The following will be the classes and awards:—Class I. (Photographs), gold medal for the best photograph in the exhibition; silver medal for the best landscape or seascape, interior or genre subject, not enlarged; silver medal for the best portrait, not enlarged; silver medal for the best enlargement; six bronze medals to be distributed at the discretion of the judges. Class II. (Lantern Slides), silver medal for best set of six lantern slides; two bronze medals for the next best sets. Class III. (Scientific—Photo-micrography and Stellar Photography), bronze medal. Messrs. H. P. Robinson, J. Gale, and J. B. B. Wellington will be the judges. The proceeds of the exhibition, after paying expenses, will be given to the Hastings, St. Leonard's, and East Sussex Hospital. Further particulars may be obtained from the Hon. Secretary, Mr. A. Brooker, Memorial Buildings, Manchester.

COLD WEATHER NOTES.

BY C. BRANGWIN BARNES.

NOTWITHSTANDING the oft-repeated announcement to the public of "weather no object," it is still a fact acknowledged by photographers, amongst themselves, that photographs produced in the winter are not so good as those produced during what is generally termed "the season." There are many reasons why such should be the case, but it should be borne in mind that there are ways and means of getting over—or, at any rate, minimising—the troubles to which operators and printers are heirs in the winter of their discontent. I do not suppose, for a single instant, that the few hints I am about to make will convert that "winter" into "glorious summer," but they may perchance be of some slight assistance to some fellow worker, and it is with this hope that I am sending them forth. Of course, the old hand will say that I am giving him nothing new; that my notes are merely old wheezes that he was aware of long ago: but there are still many new workers in the profession who may not have been so blessed, and it is for their benefit that I am now writing.

To commence with the studio, it will be found that if the lens be left therein over night, the glasses will be covered with moisture in the morning, which moisture should always be carefully removed before using the lens. The same will be found on both focussing screen and eye-piece. I have found that a short focus lens, as a rule, is better to use in winter than a long focus, as there is usually a certain amount of mist in the atmosphere, which, interposing between the sitter and the camera, is often the cause of a foggy image. Although it is the rule to keep the studio at a fair temperature during the day, the fire is usually let out when the hours of operating are over. This should not be the case, as, if the stove is kept burning until retiring time, and then filled up with small coke, so as to keep just alight till morning, there will be no trouble with the snow, which would otherwise settle on the roof, and cause some trouble to clear off, to say nothing of the risk of a pane or two being broken, or of an early sitter having to be taken with side-light only. The small fire burning all night will also render it a possibility to keep plants alive in the studio all through the winter, which is a decided advantage.

It is not only the studio that requires to be kept warm, but the dark room also, as many a weak and misty image owes its defects to the coldness of the room and the developer. If the dark room be kept warm, the various solutions will be in better working order, and, what is more, so will the operator. It is far from pleasant to have to thaw the tap to get at the water with which to mix the developer, nor is the pleasure at all enhanced by the use of that same developer for some twenty minutes or half an hour, especially if the fixing solution has just been mixed with some more of the same ice-cold water. If there be no means of warming the dark room, the solution should be kept elsewhere, as a developer only a few degrees removed from freezing-point will never yield so good a result as one at a normal temperature, and the temptation to increase its rapidity by strengthening it is not only more costly, but of very little use. When the water is supplied direct from the main, without the intervention of a cistern, no amount of warmth in the dark room will be of any use, unless a quantity is drawn off from the tap and allowed to stand for an hour or so.

The following developer is, I find, a very useful one for winter purposes, as the main body of the solution, being ready mixed, can be kept in a warm place until wanted for use, added to which, it gives negatives of a colour very close to that of the wet collodion process:—A. To. ½ lb. of sulphite of soda (pure) add 50 ounces of boiling water, and ¼ lb. of common washing soda; when cool, make up to 100 ounces with water. B. 1 ounce of pyrogallic acid; make up to 7 ounces with *rain or distilled* water, and add 4 drops of nitric acid. To develop, take 30 parts of A to 1 of B. Some operators object to the use of soda. When such is the case, the sulphite should be mixed with the boiling water, and 2½ ounces of liquid ammonia added thereto when cool. This developer is merely an adaptation of that issued by Messrs. Pollard and Graham with their plates, such adaptation acting well with me, but may require some further modifications in other hands. I would in no case advise the addition of bromide, although a bottle containing the following solution should always be at hand ready for an emergency, such as an over-exposed plate:—

Bromide of potassium	1 ounce
Water	10 ounces

One or two drops of this added to the developer will be found to have a marvellous effect. When ammonia is used in place of soda, bromide of ammonium will be found preferable to bromide of potassium.

All negatives should be varnished before a single print is taken from them, but if it is necessary to take a print in order to test the density of a doubtful plate, a thin sheet of mica should be inserted between the film and the albumen paper, as at the present season of the year the gelatine film is very apt to take up some silver from the paper, and so ruin the negative, or at any rate cause considerable waste of time and trouble. In a former article I recommended the use of an old, untoned print to back up the fresh paper during printing, and would now again draw attention to the same, as it will be found to have a really marvellous effect in preserving the colour of the print, and every tyro knows that a yellowed print never tones up like a good one. The practice of warming the toning bath is one I am unable to commend, as it has a tendency to cause mealiness in the prints. If the bottle containing the solution is kept in a warm room, the toning will be found to proceed as regularly and as rapidly as in summer. The hypo bath should be mixed with warm water and used when cold, and chilled water used for the first washing or two after fixation. By this means blisters will be avoided. Saturday's prints should be left over until the Monday to tone, as the prolonged washing they would otherwise get tends not only to rot the paper, but to eat away the albumen, and so cause premature fading of the prints.

CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION.—A special class will be formed in addition to the published schedule, and a silver medal will be awarded for the best picture, irrespective of subject, to be selected by the judges from amongst those pictures which have never been previously shown at a public exhibition. Pictures entered for this prize will be equally eligible for award in their several classes. Two additional silver medals will be given: one for the best picture, irrespective of class, in the amateur section; and one for the best picture, irrespective of class, in the professional section, neither picture having taken any other award in this exhibition. The whole of the exhibitors in the apparatus division will be asked to adjudicate upon these supplementary awards. The applications for space this year, we are informed, are already far ahead of previous shows.

Notes.

Mr. Ralph Robinson, in his letter last week entitled "Reproduction and Copyright," has contrived to miss the point of our contention. Our proposition was not that the principal of a newspaper should consider he had the right to dispose of the block made from a photograph, but whether a certain firm of photographers should place a prohibitive fee upon the right to produce electros from that block for sale to other papers. The whole qestion is one of market value, and while, as we said, the firm in question knows its own business, we still maintain that it loses rather than gains by its high charges.

Mr. Robinson appears to have in his mind photographs which involve a good deal of time and expense, and which are intended to be pictures in the highest sense of the term. If not, it is hard to understand the relevancy of his remark that "There is very exceptionally any encouragement to professional photographers to produce pictures except the love of it, and the expense is to many a very serious consideration; and surely anything which makes the practice of art less burdersome to the pocket of the photographer should receive the support of the photographic press." But all this is wholly outside the point at issue. It is very desirable that portrait photographers should make their pictures as artistic as they can, but we presume no professional photographer can afford to ignore the fact that he is engaged in a business which must be made to pay if he values his peace of mind. The manufacture of as many negatives as possible in one day is the aim of the average portrait photographer, and if he wishes to increase his business, advertisements are not to be despised. We therefore contend that the advertising of a photographer's name in a newspaper *is* a *quid pro quo* in the cases we have in our mind, namely, where the portraits of nonentities are taken in the ordinary way of business, and the photographer has been already paid for making the negative.

To descend from theory to practice. It has become the custom of late years for both the *Illustrated London News* and the *Graphic* to go in extensively for portraits, not merely of celebrities, but of the rank and file who have obtained mention, perhaps for the first and last time in their lives, in the newspapers. Among these may be classed a large proportion of the members of a new House of Commons, and, descending in the scale, we come to the members of the London County Council, the London School Board, and other organizations. Most of these portraits have absolutely no market value; but if, through any accidental circumstance, one of the common-places takes the chair, say, at a local meeting, the editor of the local paper may contemplate the advisability of giving his portrait. For cheapness and convenience, he goes to the agency which acts for the illustrated papers, and selects the portrait. In every case but that of the firm he mentions, he finds that an acknowledgment of the photographer beyond the price paid for the electro is all that is demanded. But if the portrait happens to have been taken by the Stereoscopic Company a fee of 10s. is demanded. Thus he may find that, while the electro itself is but 5s., the right to use it costs double as much. We do not question the right of the Company to charge what they like; we only question the policy.

The matter *per se* is one wholly of pounds, shillings, and pence; but we have dealt with it at some length, because of its importance, and also because out of it arises a new aspect of the ancient question, which has always troubled the minds of photographers—the ownership of the negative. The law on the point is not so settled as some suppose. The custom of the trade is that the ownership and copyright are vested in the producer, but that, to quote the words of Mr. W. E. Debenham in an article on the subject which appeared in the PHOTOGRAPHIC NEWS of December 7th, 1888, "the right to the possession of the negative ought not to imply any right to the use of the negative, otherwise than by permission or desire of the sitter." Of course the permission to reproduce by an illustrated paper is given in every instance by the sitter to the Stereoscopic Company, but if the Company makes money out of copyright charges, ought not the sitter in equity to claim a portion? Whether anybody under the circumstances would so claim has nothing to do with the matter; the point is, that the fee, whenever it is obtained, is a comfortable addition to the price paid for making the negative. The growing tendency to illustrate newspapers and journals of every class, especially in regard to portraiture, has made the photographer an important factor, and his policy surely should be rather to give facilities than check them.

The mining prospector is just now a very important personage. His mission is to go roaming about all over the world in search of auriferous properties. He is obliged to be very astute, and not disclose his real object, so as to get the property for "a mere song," after which he proceeds to plant it on the London investment market at an enormous profit. In order to do this, he makes an extensive use of photography. Why photographs of the surface of the ground should be a proof of gold contained beneath is not for us to say, but purchasers of gold mining shares find a comfort in gazing at such pictures, and therefore the prospector takes care to indulge them. Thus we read in a financial paper that "Mr. —— is, according to American advices, roaming around the Candelaria mine, and taking photographic views, in order to once again appear before English investors with pretty views of a 'splendid property.'" This is an advance; hitherto the prospector has been content to employ a photographer; he now takes the photographs himself. It is the safer plan.

The camera is an object of dread to the untutored savage. It is not so much the uncanny look of the

thing when it is planted on its three legs, with the operator's head beneath the focussing cloth, which frightens him, as the picture itself. One can quite understand the innocence which prompts the child of nature to imagine, when he sees the counterfeit presentment of himself and his companions, that a portion of his actual being has actually been transferred to the glass. In the days of witchcraft a photographer most assuredly would have been hanged as a wizard. After a while the savage gets reconciled to the phenomenon, especially when he finds he has not come to much harm, but further acquaintance with photography itself does not always remove his suspicions. A curious instance of this comes from Afghanistan.

Some traveller in the country of the Pathans beyond Quetta, who had a camera with him, gave the natives their first knowledge of photography, and this appears to have been received with much disfavour, for, on the surveyor of the Madras Government Department proceeding thither on a professional mission, he met with a hostile reception. It is true he had not got a camera, but he was in possession of a theodolite, and this, in the eyes of the Pathans, was much the same thing. The dislike to the camera, it appears, springs from the fact that it takes pictures upside down. But, in addition, the Pathans imagine, when the surveyor is using his theodolite, that he can see through the walls of houses, with the appalling result that the ladies of the household are photographed standing on their heads by the infidel! It was a mistake for the first photographer in the Pathan country to allow the natives to look at the ground glass screen of the camera. He forgot that a little learning is a dangerous thing.

Rejlander, as Mr. H. P. Robinson pointed out last week, read but one paper before a photographic society. He was not given to rushing into print, and, as Mr. Robinson has said, preferred to convey his thoughts by means of his art. It was in conversation with him that one was able to obtain his ideas on the possibilities of photography, and fresh, original, and valuable they were. At a dinner of the South London Photographic Society he made a speech full of home truths, expressed in a quaint racy fashion. It was so difficult to get any of Rejlander's opinions on paper, that a member who was present who wrote shorthand, hailed the opportunity and took down his speech, which made its appearance in the YEAR-BOOK for that year. It is rather curious to see in some memoranda found after his death how he foreshadowed the detective camera. "Except truth of drawing," he wrote, "expression is, I think, the most important thing in a portrait, and the expression which is unpremeditated and unconscious the best. I should be very glad to possess a lens that did not need focussing. I should carry it in my pocket, and with a dry collodion process I would catch positions and expressions in a crowd far better than with my own eyes, for those poor orbs have to obey fixed laws; they cannot even see a man clearly in the street while looking at a spot in the window frame."

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

TONING ALBUMEN PRINTS—MAGNESIUM FLASH-LIGHT STUDIO—WINTER PICTURES—DEVELOPERS FOR PRINTS ON GELATINO-CHLORIDE PAPER.

Toning Albumen Prints.—An entirely reliable formula, which has been in use for many years with satisfactory results in one of the most eminent photographic establishments of this country, is the following. Two solutions are made up:—

Solution No. 1.

Water	1,000 c.c.
Acetate of soda	50 grammes

Solution No. 2.

Water	1,000 c.c.
Gold chloride	1 gramme

For use take:—

Solution No. 1	100 c.c.
Solution No. 2	50 c.c.
Water	100 c.c.

Carbonate of soda, sufficient to neutralise the bath.

After the bath has been used for toning, one-half of it is poured into the residues, and every day half a bath of the above-given proportions is added to the rest remaining in each case. If it is intended to tone in the evening, then the addition to the toning bath should always be made in the morning of the same day. This toning bath can be recommended to the profession in every respect.

A Magnesium Flash Light Studio.—Professor Schirm, of Breslau, some weeks ago opened a new photographic studio at Berlin, in which instantaneous pictures are taken only by magnesium flash light. The well-known flash lamp, constructed by Professor Schirm himself, is used. A system of seven to nine lamps for a single portrait, and double the number and even more for groups, is employed. The lamps are suspended from the ceiling, and can be pushed to and fro on iron rails, which run parallel to the walls. Four lamps are kept burning nearly alongside of the sitter, three in front, one behind sideways to illuminate the background. With the whole set of lamps a pair of bellows is combined, by the aid of which all the lamps are lighted at once. Besides, the pair of bellows are by electrical contact combined with the shutters of the objective lens; as soon as the cap is removed from the lens, the pair of bellows are released by means of electricity, and the magnesium lights produced. When, however, the bellows are compressed for about one and a half inch, the circuit is at once closed, the cap of the lens being closed at the same time. In this way the exposure amounts only to one-tenth of a second, though the magnesium lights are burning for a somewhat longer time. The same arrangement is used for the production of prints and of enlargements. If a print is to be produced of a portrait negative a very short time after the exposure, a piece of wet gelatino-bromide paper is squeegeed on to the fixed and washed negative whilst still wet, then exposed at a distance of three to four feet from the flash light, and developed with eikonogen. The new studio is declared a decided progress by such authorities, for instance, as Professor H. W. Vogel, who devoted to it a leader in his journal.

Winter Pictures from the Hartz Mountains.—A well-known meteorologist has on a cold, but splendid winter day, de-

scended the Brocken, the celebrated scene of the St. Walpurgis Night in Goethe's "Faust," and, by the aid of an academy camera, taken several highly interesting photographs of the snow-covered scenery. A few of them we reproduce here in block form. Figs. 1, 2, and 3 show a group of scanty pines, standing on the brows of the mountain, being so completely covered with rime in all their branches, that they have entirely lost their original

Fig. 1.

form, and look like the strangest forms of animals or masses of rocks bristling with ice. In bright sunshine

Fig. 2.

they present a magnificent appearance. The wanderer, wading with difficulty in the deep snow covering all the rugged rocks and glens, perceives these ice-blocks only when he is quite near, and then finds himself surrounded by white figures, not unlike white bears or praying nuns. Fig. 4 shows a telegraph pole, which by the rime has been transformed to a figure something like a huge fungus. The wire of the telegraph is now always removed at the beginning of the winter, because it has

Fig. 3.

formerly been torn by the weight of the adhering ice; three years ago, at an occasional research, the wire be-

Fig. 4.

tween two poles was found to bear a charge of ice amounting to 1,100 pounds.

Developers for Prints on Gelatino-Chloride Paper.—Dr. E. A. Just, of Vienna, the well-known manufacturer of photographic papers, publishes the following developing formulæ, which are also recommended by Dr. Stolze as excellent.

1.—*Hydroxylamine Developer.*

a. Caustic soda 10 parts, water 1,000 parts.

b. Hydroxylamine hydrochlor. 5 parts, alcohol 100 parts, water 200 parts.

c. Potassium bromide 1 part, water 50 parts.

For brownish-black tones, are mixed :—

Solution	*a*	...	...	...	...	...	100 parts
,,	*b*	...	...	...	...	...	17 ,,
,,	*c*	...	...	...	...	...	1·5 ,,

For sepia tones, are taken (the time of exposure being at the same time doubled) :—

Solution *a*	100 parts
„ *b*	12·5 „
„ *c*	1·5 „

For reddish-brown to red tones, are taken (the time of exposure being four to eight times as long as in the first formula) :—

Solution *a*	100 parts
„ *b*	8·5 „
„ *c*	1·5 „

II.—*Eikonogen Developer. Solution* A.

Water	300 parts
Sodium sulphite	4 „
Potassium meta-bisulphite	1 part
Eikonogen	1 „

Solution B.

Water...	300 parts
Soda (crystall.)	4 „
Glacial acetic acid	1 part

With sufficient exposure, equal parts of solution A and B give beautiful red to reddish-brown tones. Subsequently the prints are treated with an acid bath of water 500, glacial acetic acid 1.

III.—*Neutral Citrate Developer.*

The neutral citrate of ammonium has the advantage over the acid one, that it does not mould as quickly as the latter, 600 parts of citric acid are dissolved in 2,000 to 3,000 parts of distilled water, which solution is neutralised with ammonia in the same manner as in the case of ammonio-acetate. The following are mixed :—

Ammonio citrate solution	150 parts
Sulphate of iron solution 1 : 3	50 „

The clear greenish solution does not become muddy, even with sulphate of iron in excess. With short exposures, beautiful blackish-grey tones are obtained ; with prolonged exposures, sepia tones, and, if the solution is diluted, red tones. To prepare a stronger developer, 168 parts of citric acid are dissolved in 500 parts of water, which solution is neutralised with ammonia (0·91 spec. weight), and diluted with water up to 800 parts. Then are mixed :—

Ammonio-citrate solution	100 parts
Sulphate of iron in crystals...	15 „

After this has completely dissolved, well set, and to some degree oxidised in the air, the developer is ready for use. The developer becomes blackish-green by oxydation, but it may be recovered if, after some iron-wire has been put into it, it is made slightly acid by means of citric acid, and exposed to the light.

IV.—*Hydroquinone Developer.*

This developer is one of the best, especially if it is not used freshly prepared, the tones resulting being vigorous and of beautiful gradation. For *black tones*, are mixed :—

Water...	300 parts
Hydroquinone	1 part
Sodium sulphite	6 parts
Potassium metabisulphite	0·33 „
Potash	11 „

For *red tones* :—

Water...	600 parts
Hydroquinone	1 part
Sodium sulphite	12 parts
Potassium metabisulphite	0·33 part
Caustic potassium	1·5 parts
Potash	4 „

A very good formula is also the following by Detaille Frères :—

Water	30 parts
Hydrokinone	1 part
Sodium sulphite	7·5 parts

mixed with

Water	60 parts
Potash	15 „
Acetic acid	1·5 „

This developer gives *black tones*. For *red tones* the following is recommended :—

Water...	50 parts
Hydroquinone	1 part
Sodium sulphite	7·5 parts

mixed with

Water...	400 parts
Potash	15 „
Acetic acid	6 „

PHOTOGRAPHY OF THE INSANE FOR PURPOSES OF PSYCHIATRIA.*

BY DR. EDER.

Instantaneous photography has been employed for some time in psychiatria, and for the illustration of works on diseases of the mind and nervous system.

The true-to-life pictures of the sick in their various phases, convulsive attacks of all kinds, such as Charcot, for example, takes for his object-teaching, or such as are to be found in the annual reports of the Insane Asylum at St. Servolo, point out to us the manner in which the instantaneous photography of the insane in the various asylums should be practised.

The professional man is very often able to hit upon the correct diagnosis from the appearance of an insane person, from his carriage, his face, the play of his mind. Undoubtedly, by photographing a number of carefully chosen so-called "classical" cases, pictures would be obtained which would be valuable, either for object teaching or for the study of the individual cases ; besides, much would be suggested by the study of the facial mechanism in the various mind diseases ; for example, in melancholia, and mania. These instantaneous photographs furnish such true representations of the circumstances that every professional man can recognize from them the characteristic symptoms of the disease, which cannot be said in regard to pictures of the insane drawn by hand.

Especial attention was turned to this work on the part of the Imperial-Royal Institute and Experimental School for Photography, and on the invitation of Dr. Krajatsch, head physician in the Lower Austrian National Insane Asylum at Kierling-Gugging, photographs of various insane patients were made by Dr. Eder and Professor Lenhard. A Voigtländer Euryscope of 66 mm. opening and a shutter by Thury and Amey were used. The photographs were perfectly successful, and the collection was a gathering point for doctors and other visitors at the last exhibition of the Imperial Royal Institute, and a specimen picture—reproduced in collotype by the students at the Institute—was inserted in the illustrated catalogue of the exhibition.

Photographic Club.—The subject for discussion on Jan. 15 will be "The Intensification and Reduction of Negatives."

* Translated for *Wilson's Photographic Magazine* from the *Photo Archiv.*

PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.*

BY W. JEROME HARRISON, F.G.S.

Zoology of Warwickshire.—In the minute life which occupies our ponds and ditches there is a never-ending field of work for the photographer who combines the camera with the microscope. Some of us know, too, that it is better fun to hunt with the camera than with the gun: and we hope to be able to photograph the local birds, &c., in their native haunts, and so to secure pictures which shall surpass the best efforts of the taxidermist.

Methods of Conducting the Photographic Survey of a District.—There are several ways in which the photographic survey of any district may be carried out.

1. First we have what may be called the "no method." Each member of the society or body by which the survey is to be carried out wanders at will over the district, photographing whatever pleases his eye, and sending in his negatives or prints to the managing committee. It is not necessary to point out the demerits of such a scheme.

2. If there is any good, modern, and tolerably cheap county history in existence, it might well furnish the ground-work for a general photo-survey. Lists of all the places and objects named in its pages should be drawn up, and grouped according to locality; each division being then allotted to those workers who have volunteered their services. For Warwickshire the recent publication of an admirable county history,† by Mr. Sam. Timmins, offers a capital opportunity, the more especially as the book itself contains no illustrations. Any member who wishes to form a very valuable and interesting volume can do so by pulling Mr. Timmins's book to pieces—which is just what its reviewers have *not* done—interleaving it with a series of illustrations such as I have suggested, and then having it rebound.

3. But for an exhaustive photo-survey of Warwickshire, or of any other district, I believe the plan must be based upon a large scale and accurate map; and we must go to nature herself for our illustrations. Fortunately we are now provided with a map or maps—the work of the Government Ordnance Survey—which is in every respect admirable.

(*a.*) *The Old One-inch Ordnance Map.*—Warwickshire was mapped on the scale of one inch to one mile as long ago as 1830. This map is sold in "quarter sheets" at one shilling each, each quarter sheet including about 160 square miles. The entire county on this scale makes a map 59in. by 42in., which is sold in sheets for 17s. 6d.

(*b.*) *The New One-inch Ordnance Map.*—The map described in the last paragraph is now, in some respects, out of date. But a new one-inch map is being prepared—by reduction from the six-inch map—which will be a great improvement. It will be similar in size and price to the old one-inch map. We can hardly expect to have this map for Warwickshire for a period of several years.

(*c.*) *The Six-inch Ordnance Map.*—This is the ideal map for the work of a photo-survey. Its large scale—six inches to every mile—allows every field, and even every tree, to be depicted. The orientation of buildings is clearly shown, so that the photographer can see beforehand when the light will fall suitably upon any building, ruin, &c., that he may have to travel a long distance to photograph. The issue of the Warwickshire map on this scale is very nearly complete. The county is contained in two hundred quarter sheets, each measuring 18in. by 12in., and including six square miles. They are sold at one shilling each, and 195 have been published.

(*d.*) The *Parish Maps* are on the still larger scale of twenty-five inches to a mile. Four of these parish maps contain an area equal to one quarter sheet of the six-inch map. Each parish map measures 38in. by 25¼in., and contains an area of a little more than 1½ square miles. These also are all but complete for Warwickshire; and in some cases, as in Stratford, the ruins of Kenilworth, &c., they will be very useful to the photo-surveyor.

(*e.*) Lastly, there are the town plans, on the scale of 125 inches to a mile.

Plan now proposed for the Photo-Survey of Warwickshire:—

1. A committee must be appointed, by whom the details of the plan can be formulated.

2. The maps of the county on the six-inch scale must be purchased. For each sheet of the map there must also be a light cardboard box* bearing the same number as the map. In this box, mounted prints of all the photographs taken from objects contained in that sheet of the map should be kept.

A similarly numbered set of negative boxes† would be needed to contain the negatives belonging to each sheet of the map.

3. All photographers who would be willing to place their services at the disposal of the Society should send their names—in pairs if preferred—to the committee.

4. The committee would decide on a certain patch of country to be surveyed—say that included on twelve sheets of the six-inch map, if twenty-four names were received. They would then allot the maps by ballot or otherwise among the workers, giving one map to each pair.

5. Let us suppose that two friends, A and B, are allotted a certain area, say that contained in one quarter sheet of the six-inch map, including an area of six square miles.

They carefully study the map and draw up lists of the promising points. They read up the history of any churches, ruins, or other monuments of the past included within it. Then they visit it for the first time, *without their cameras.* They walk across and across the district, calling perhaps at the inns, the farm house, or the rectory, gaining information and jotting down places and times when the light will be favourable. On their next visit they are accompanied by their cameras, and the negatives necessary to illustrate the area—perhaps only two or three, perhaps ten or twenty—are soon secured; or a second and third visit are paid if necessary. Prints are then taken and lantern slides made, and the results are handed over to the committee.

6. If a sufficient number of subscribers could be obtained, it would be very desirable to publish, perhaps monthly or quarterly, a selection of the most interesting photographs obtained, accompanied by descriptive letterpress. There must be many people in the county who would prize such a local record.

7. The principal books and works of reference upon the county should be added to the library of the Society, and lists of the large collections of books, &c., on the same subjects contained in the local libraries should be posted on the walls of the club rooms.

* Continued from page 13.

† Published by Elliot Stock, price 7s. 6d.

* Those sold for holding pamphlets, papers, &c., by Stone, of Banbury, would answer well for this purpose.

† Those made by Arundel and Marshall, Penn Street Works, Hoxton, London, are recommended.

8. One night in each week might be considered a "rendezvous night," on which all who were interested in the work of the survey should meet at the club rooms; and on (say) one evening in each session of the Society there might be a more public display of the results which were being obtained. The year's work in this direction would naturally form an important feature of the Society's annual exhibition.

(To be continued.)

Patent Intelligence.

Applications for Letters Patent.

20,599. G. WALKER, 6, Livery Street, Birmingham, "Pictorial Photographic Earthenware Tiles."—December 23rd.

20,613. L. DAVIS, 68, Fleet Street, London, "Photographic Albums."—December 23rd.

20,662. W. H. CALDWELL, 17, Lincoln's Inn Fields, London, "Sensitizing and Developing Chloride of Silver for Photographic Purposes."—December 23rd.

20,699. W. H. BATH, 128, Colmore Row, Birmingham, "Miniature Photographs."—December 23rd.

20,706. E. J. BALL, 39, Aynhoe Road, West Kensington Park, London, "Photographic Coin-Freed Apparatus.

20,810. B. WILLCOX, 47, Lincoln's Inn Fields, London, "Improvements in Mirrors."—December 27th.

26. R. W. THOMAS and L. INGER, 38, Holborn Viaduct, London, "Focussing Appliance."—January 1st.

52. L. G. STRANGMAN, 3, Ardenza Terrace, Dublin, "Camera Stand."—January 2nd.

82. R. SLINGSBY, 115, Cannon Street, London, "Carriers for Magnesium Flash Lamps."—January 2nd.

151. J. B. BROOKS, 6, Livery Street, Birmingham. "Photographic Developing Appliance."—January 4th.

166. A. J. JONES, 17, Lawn Road, Haverstock Hill, London, "Holding a Bellows Body Camera Rigidly Extended without a Baseboard."—January 4th.

173. F. KITTO, 18, Fulham Place, London, "Apparatus for Holding Photographs."—January 4th.

Specifications Published.

18,099.—30*th November*, 1889. "Improvements in Photographic Cameras." THOMAS PARSONS WATSON, 313, High Holborn, London, W.C., Optical Instrument Maker.

The invention relates to improvements in photographic cameras of the Kinnear or other collapsible type, particularly those which are collapsed and folded by laying the camera front face downwards upon the baseboard. The improvements have for their object generally to render the camera lighter, more compact when folded for carrying, and more easily erected and closed than existing cameras of similar types. In order that the improvements may be more readily understood, they are illustrated in drawings accompanying the specification, and with reference thereto are described.

The first improvement relates to the pivoting of the frame—in which the rising front is fitted to slide—to the travelling frame of the baseboard by means of lateral gudgeons, and it consists in providing means whereby the said gudgeons will be securely retained in their bearings when the camera is in use, but may be readily removed therefrom when required by a simple backward swinging movement of the camera front, which may be effected by one hand.

The improvements have secondly for their object to provide means whereby the rising front will be retained at any height at which it may be set, whilst free motion of the front in its guides will be permitted after the front has been laid face downwards upon the baseboard. The purpose of permitting this free sliding motion of the front is, that when the bellows-body is being collapsed by the back frame of the camera being folded forwards, the front may be free to adjust itself, so as to avoid undue strains on the bellows-body.

The invention relates, lastly, to an improved self-engaging catch for locking the baseboard and back together when the camera is folded up.

The following are the claims:—

1. The combination with the lateral gudgeons of the front supporting frame, and with L-shaped bearing notches therefor; of spring latches adapted to lock the gudgeons in their notches as described; and of abutments on the front frame adapted to act on the spring latches by a backward tilting motion of the front frame, substantially as and for the purpose specified.

2. The combination with a notched edge of the rising front, of a spring bolt mounted on the front supporting frame, and adapted to engage with the front for the purpose of supporting it at the desired height, and of means, substantially as described, whereby, when the front is laid down on the baseboard, the bolt will be disengaged, and the front free to slide and adjust itself in the supporting frame, as specified.

3. Fitting the front to slide in its supporting frame by the convex edges of the former being received in corresponding concave grooves in the latter, and notching the convex edge of the front for engagement with a spring bolt, substantially as specified.

4. The self-engaging spring catch for locking the baseboard and back together, the catch being constructed and operating in the manner specified.

711.—30*th November*, 1889. "Improvements in the Production of Films Sensitive to Light, and of Materials for Assisting or Continuing the Effect of Light on Photographic Films." ALEXANDER FERDINAND YORK SCHWARTZ, Chemist, and Dr. FRIEDRICH HERMANN MERCKLIN, Chemist, both of Hanover, in the German Empire.

In the course of their complete specification, the patentees say:—

1. If, in the preparation of a photographic film by the emulsion method, silver oxymethyl-sulphonate—which is also soluble in alcohol—or a compound of the silver oxymethyl-sulphonate with the oxymethyl-sulphonate of an alkali or of ammonia, or a mixture of the said bodies, is added to the finished emulsion, in the proportion of 1 to 2 parts of the said oxymethyl-sulphonate or mixture to 100 parts of the halogen silver contained in the emulsion; or if the said addition is made before the ripening of the emulsion; or if, in the preparation of photographic films by the processes in which the film, impregnated with metallic chloride, bromide, or iodide, is dipped into a silver bath, we add silver oxymethyl-sulphonate, or a double compound of the silver oxymethyl-sulphonate with the oxymethyl-sulphonate of an alkali or of ammonia, we obtain photographic films which are more sensitive to light—even to weak light—than the films prepared by the ordinary methods.

2. If an ordinary dry plate is bathed before exposure in a neutral aqueous solution containing from 0·1 to 0·2 per cent. of the silver compounds mentioned under 1 for a period of half to three minutes, according to its sensitiveness, or in an equally diluted aqueous and slightly alkaline solution of the form-aldehyde, or of the para-form-aldehyde, or of the oxymethyl-sulphonate of an alkali or of ammonia, or of a mixture of these salts, and if the plate is then slightly rinsed and again dried, the photographic results are similar to those obtained if the films have been treated by method 1.

Instead of bathing the dry plate before exposure, it may be bathed after exposure; or, instead of applying the said compounds in the shape of a special bath, a few drops of a neutral 1 per cent. solution of the alkali, or of the ammonia-oxymethyl-sulphonate, or of their mixtures, may be added to one of the usual developing mixtures.

3. If the ferrous oxylate developer is prepared by means of the ferrous oxymethyl-sulphonate, or, better still, by means of the combination of the same with the oxymethyl-sulphonate of an alkali or of ammonia, only about a quarter of the usual quantity of iron is necessary in order to obtain equally good results as with the ordinary iron developer, whereby the durability or stability of the developer is increased.

4. The oxymethyl-sulphonate of hydroxylamine in alkaline solution gives excellent results when used as a developer.

The claim is :—

The use of form-aldehyde, or of para-form-aldehyde, or of the compounds of form-aldehyde—which must be considered as salts of the oxymethyl-sulphonic acid—with an alkali, ammonia, iron, silver, or of a mixture or combination of the said salts, either alone or in combination with other suitable substances, for the preparation of highly-sensitive photographic films, and for the production of chemicals or solutions which assist or continue the effect of light on photographic films.

17,198.—*26th November*, 1888. "Improvements in Photographic Shutters." EDMOND PERKEN, FREDERIC LOUIS PERKEN, and ARTHUR RAYMENT, trading as Perken, Son, and Rayment, of 99, Hatton Garden, in the city of London, Wholesale Opticians, and WALTER PEAD, of 99, High Street, Ramsgate, in the county of Kent, Artisan.

The shutter slide is made very thin, of any suitable materials —advantageously thin sheet metal—which travels loosely in guides advantageously formed in and by the frame of the shutter. On the upper end of this slide is a projecting pin or stud, under which a spring-actuated lever secured to the said frame is placed, and the end of the said lever is held by a catch, which may be actuated by a pneumatic releasing apparatus, as is well understood, or otherwise, as desired. The said lever, on being released by said catch, throws up the shutter slide, and so gives the exposure, the slide falling again by its own weight, or, for a very short exposure, assisted by a spring. A lever, actuated by the pneumatic release, makes contact with the slide when open, and regulates the length of exposure, or by any other convenient arrangement.

A break arrangement may also be provided, so as to hold the shutter open for the purpose of focussing.

The description is accompanied by a sheet of drawings.

The claims are ;—

1. A shutter slide sliding freely in the shutter frame, and unattached to any other parts of the apparatus, in combination and acting in conjunction with a spring lever, which throws up the said shutter slide, and leaves the latter free to fall again by its own gravity.

2. The combination of the shutter slide and spring lever with the releasing catch or trigger, one part of which engages with said lever, and the other part having a pin thereon to engage with a notch on the slide, arranged and acting substantially in the manner and for the purposes hereinbefore described.

18,796.—*December 22nd*, 1888. "Heads for Camera Stands." JAMES HEBER TAYLOR, Little Trinity, Cambridge, M.A., Queen's College, Oxford, M.A., Trinity College, Cambridge, B.Sc., London.

The objects of this invention are primarily to provide a ready means by movements of rotation only, of changing the position of a photographic camera, constructed to take pictures on oblong plates from the position in which the long side is horizontal to that in which the long side is vertical, so that the camera in each position shall be in a position of stable equilibrium over, or nearly over, the centre of the tripod stand. Secondarily, to enable the camera to be directed upwards or downwards at any required angle.

The camera is attached to a block which is pivoted horizontally between the ends of two parallel bars, so as to turn freely round from one side of the bars to the other. The bars are pivoted towards their other extremities about a horizontal axis parallel to the axis of the block, these pivots being carried on a stage which is attached to or may form part of the tripod head. Short extensions of the bars beyond these last-named pivots are used for the purpose of securing the bars when at right angles to the stage, *i.e.*, the stage being horizontal when the bars are vertical.

The bars may also be secured at any required angle or inclination by a strut jointed to the bars, and made to engage with the side of the stage opposite to the pivots which connect the stage with the bars.

The stage forms a flat surface on which the camera may rest when the bars are either horizontal or vertical.

The camera, when vertical or inclined, can be held in a position overhanging the stage and admitting of back focussing.

The camera may be attached to the block by a base-screw of the ordinary type. By movement around the base-screw the camera may be inclined upwards or downwards when the bars are vertical. A slot in the block, at right angles to its axis, makes the same apparatus available for different cameras not differing greatly in dimensions. Or with the same object the block may be pivoted not directly to the parallel bars, but to an inner frame which slides between the bars, and is capable of being clamped at any desired point. Or sometimes I provide a dove-tail projection upon the base of the camera, and parallel V-guides are attached to the block at right angles to its axis of rotation, and suitable means of clamping the camera when in position are provided. The lengthening of these guides beyond the length of the side of the projection from the base of the camera makes the same piece of apparatus available for cameras differing somewhat in dimensions.

The block may have within it a turn-table to which V-guides are fixed.

The stage may be rigidly attached to a triangle-head for the tripod stand, but by preference I attach it by a central pin which forms a vertical axis, about which the whole stage rotates as a turn-table on the tripod-head.

The inventor claims : —

1. Constructing a reversing head for camera stands of block parallel bars and stage substantially as described, so that an oblong plate may be quickly changed from the horizontal to the vertical position of the long side, the camera in each position being above or nearly above the centre of the tripod head.

2. The combination of the parts mentioned in claim 1 with provision for depressing or elevating the axis of the lens through any desired angle with the horizontal, and fixing it there by suitable clamps or other device.

3. The combination of either of the forms described in claims 1 and 2 with a turn-table for attachment to the triangle of a tripod stand.

4. The combination of either of the forms described in claims 1 and 2 with a triangle head for a tripod stand.

5. The combination of either of the forms described in claims 1 and 2 with turn-table and triangle head for a tripod stand.

ALBO-CARBON gas-burners increase the light about 30 per cent., and they can easily be adapted to most enlarging lanterns. —*Photographic Scraps.*

EDINBURGH PHOTOGRAPHIC SOCIETY.—The first popular meeting of the session will be held in Queen Street Hall, on Wednesday, the 29th January. A varied series of transparencies, the work of members, will be shown on the screen, accompanied with descriptive remarks.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—On Tuesday, January 14th, at 8 p.m., at the Gallery, 5A, Pall Mall East, the following papers will be read : —"Control in the Density of Negatives," by Mr. Chapman Jones, F.C.S., F.I.C., "Distance beyond which all Objects are in Focus with any given Lens," by Sir David Salomons ; "Eikonogen as a Developer," from Professor W. K. Burton.

PARIS EXHIBITION.—The French Ambassador, it is stated, will present, in the name of the President of the French Republic, the decorations conferred upon British subjects in connection with the Paris Exhibition, on Saturday, January 25th, when Sir Polydore de Keyser, the president of the British Section, will entertain his Excellency and the council of the section, with other guests, at dinner at the Mansion House, which has been placed at his disposal by the Lord Mayor.

VERY LIKE.—"It's a good picture, but its no likeness," was the criticism of his own portrait made by a well-known violinist. His family had agreed upon this harsh verdict without a dissenting voice, until the artist appealed to the youngest o the household, a bright little boy. "Who is that, Dick ?" he asked, pointing to the picture. "Papa," was the immediate answer. "So it is my dear. You see, sir, your son is a better judge of the likeness than you. So you think that you'd know it was papa, my boy ?" "Oh yes, sir," was the innocent reply. "It's very much like him about the fiddle !"—*Cassell's Saturday Journal.*

Correspondence.

REPRODUCTION AND COPYRIGHT.

SIR,—From a letter of Mr. Ralph Robinson's in the PHOTOGRAPHIC NEWS of last week, it appears that there is an impression in the minds of some photographers that it is useless to register the copyright of a photograph after it has been published. This is a misconception. As Mr. Robinson points out, the copyright is the property of the photographer, whether it has been registered or not, but he has no power to prevent others from infringing it until it has been registered, which, however, he can do at any time. The law relating to copyright in photographs depends almost entirely upon the Copyright Act of 1862. By the first section of that Act, the author of every photograph, provided he retain the negative, is entitled to the copyright in that photograph, unless it has been executed on commission, in which case it belongs to the person for whom the photograph has been taken. Of course nearly all portraits taken by the professional photographer are taken upon commission, and therefore the copyright in the negative does not belong to him, and he cannot register it. By later sections of the same Act, anyone infringing a copyright is liable to certain penalties, and if he continues to do so, he may be restrained by the Court. And by another section every copyright is to be registered at Stationers' Hall, and no action shall be sustainable, nor any penalty be recoverable in respect of anything done before registration. But there is nothing in the Act limiting the time within which the copyright must be registered. Hence, if the photographer retains the negative, he is entitled to the copyright, and can register it whenever he likes, but until he has done so it is practically of no use to him, as he has no power to prevent infringement.

There is no provision in the Act or elsewhere requiring photographs, the copyright of which has been registered, to be marked with the word "copyright," and legally it has no effect whatever, the only object being, I suppose, that it may warn others, and thereby prevent them from copying it. At any rate there appears with me to be no probability of any person being held guilty of fraud who so marks a photograph when it has not been registered.

As to the first part of Mr. Robinson's letter, here again he has the law with him. If he grants a license to a publisher to reproduce one of his pictures in a certain newspaper, and it is afterwards reproduced in a second newspaper without his further permission, he will have a right to recover damages from the publisher of the second newspaper for infringement of his copyright. It is, however, advisable that photographers should not make use of the word "copyright," when giving permission to publishers to reproduce their pictures, unless they really intend to assign the copyright altogether. As a rule they should merely say that they grant the publisher a license to reproduce the photograph in a certain specified newspaper. Such a license to be of any value must be in writing.

C. FLEETWOOD PRITCHARD.

3, *Paper Buildings, Temple, January 7th*, 1890.

ART PHOTOGRAPHY RECOGNIZED AT LAST.

SIR,—For fifty years photography has been struggling against prejudice, jealousy, and almost overpowering influence, to establish itself, not only as an art, but as a fine art, and at the end of that time it may be said to have succeeded, although there perhaps still linger in some minds those fragments of doubt which are so difficult to eradicate.

It begins its second century not only hopefully but jubilantly for its art prospects. To those who are able to discern the signs of the times, the indications are most auspicious. Two examples that appear this month are worth quoting.

The *Art Journal* has never cared to recognise its claims heartily from the time it said of one of our exhibitions, "With the photographic exhibition it is not necessary to speak of individual works as we would of the production of the painter: the cases are not parallel. The painter employs, or should employ, eye and hand, governed by a presiding mind; the photographer uses a machine, and requires a 'little' judgment. The artist works from within to that which is without; the photographer employs external agents to do his bidding."

What a change do we now see! The volume of the *Art Journal* for this year opens with a splendidly illustrated article on "Winter Photography for the Artist," by Mr. H. P. Robinson, a photographer and writer to whose example and writings in articles which have appeared principally in the PHOTOGRAPHIC NEWS, I think I may say, without fear of contradiction, we are mainly indebted for the great advance that has taken place in the art quality of photography of late years. There may be further improvements and developments, but we shall always owe to him the solid foundation on which they may rest.

The other auspicious sign appears in the January number of the *Nineteenth Century*, in an exhaustive article on the progress of art during the last decade.

Mr. Marcus B. Huish, the editor of the *Art Journal*, recognizes photography as an art, a graceful concession to photography by the chief representative of the other arts worthy of being put on record. He says: "As for photography, no one who has visited the successive exhibitions held by the various societies connected with it can have failed to recognize the advance which has taken place—an advance which, if continued, must soon give its professors a claim to admission within the ranks of artists." Surely there could be no more satisfactory recognition of photography as a fine art than that of the editor of the *Art Journal!*

GEORGE MAITLAND.

SUNDRY NOTES AND CORRECTIONS.

SIR,—I have read with very great interest Mr. H. P. Robinson's admirable sketch of the life and work of O. G. Rejlander, whom I had the honour of knowing for many years as one of the most genial members of the Solar Club. He was of Swedish origin, and died at the age of sixty-one, the date given by Mr. Robinson in a foot-note (page 9) being quite correct—January 18th, 1875. I was present at his burial on the following Saturday, 23rd, at Kensal Green Cemetery, when Mr. J. D. England attended as one of the military escort or guard of honour, Artists' Corps, to fire three volleys over his grave. This leads me on to say that I have a copy of Rejlander's double—the artist O. G. R. introducing the volunteer O. G. R.—and that I remember another use being made of this photograph by way of compliment to Mr. J. E. Mayall, apologising for coming uninvited to his house at Hove Place, Brighton, on the occasion of the volunteer review of Easter, 1871, when the late H. Baden Pritchard and myself were also there as invited guests. The print was then marked "Rejlander's Apology."

A Correction.—In my article on the new naphthol developers in the YEAR-BOOK (page 125, end of thirteenth line), for "Mr. Stenning" read Mr. J. H. Stebbins, Jnr., of New York, as being the claimant who first suggested the use of these naphthol compounds for photographic development (see the NEWS, last vol., page 733). Further on, I find that my statement of proportions for mixing the developer (YEAR-BOOK, page 126) has infringed the regulation that the quantities should be expressed in percentage amounts. The 70 grains of Meldola's naphthol acid, being equivalent to 87½ grains of eikonogen, make, with water one pint, a one per cent. solution of the latter, and this agrees in strength with that used by Messrs. Fradelle and Young, E. Vogel, Jnr., and G. Mansfield, in their experiments, as the following re-calculated table will show:—

	Vogel.	Spiller.	Fradelle.	Mansfield.
Eikonogen	1	1	1	1
Sulphite Soda	8	5	4	2
Water	100	100	100	100
Carb. Potash	12	10	—	—
Carb. Soda	—	—	1	—
Caustic Soda	—	—	—	1
Water	100	100	100	100

I am glad to learn that Mr. Warnerke gives so good an

account of the new naphthol developer, but fear he will find the use of so much caustic potash rather corrosive for a gelatine film.

Like Mr. Elder,* I have made a good search at the Patent Office for any specification bearing the name of Dr. M. Andresen, and claiming the use of eikonogen, but failed to find any such entry or record. The statement to this effect in the printed paper of instructions, and the pretended claim to be actual discoverer, are both alike quite unwarranted.

JOHN STILLER.

PHOTOGRAPHIC TOURISTS' BAGGAGE.

SIR,—In the course of an interesting article on the above subject in your issue of January 3rd, the writer, in recommending the use of portmanteaux made of basket work, makes a statement which may possibly be injurious to an enterprising and increasing trade. This is, that English workmen are not competent to make the palm-baskets at present imported from France, so that they have to be made abroad.

The real reason why these articles are not manufactured in England is that the demand for them is decreasing, and their sale comparatively small, baskets made of willow being usually preferred as being at once lighter, cheaper, and more serviceable. It is therefore not worth while for English makers to take up the manufacture of them.

It may not be known to the writer of the article that almost all the trunks used by travelling theatrical companies are now made of a foundation of wicker-work covered with leather, &c., and that trunks made in this way last three or four times as long as those made of wood, iron, or leather. Several hundred workmen are employed in England in this industry, which cannot be approached by foreign competition.

Since I have been an amateur photographer, I have often marvelled at the weighty leather cases photographers carry. I made a wicker-framed case for my own use to hold a half-plate set—camera, four slides, lenses, and accessories—which, together with green-baize lining, only weighed twelve ounces; and I am confident that by paying special heed to weight-saving, a strong and waterproof case of this size might be made weighing eight ounces complete. The cost would be perhaps half that of the usual waterproof cloth or leather case now in use.

Should you be at all interested in this matter, I will send for your inspection the case I now use. I have no trade interest to serve in this matter, my own business being entirely wholesale, and lying in quite a different direction; but I am moved to pity by the appearance of perspiring photographers, weary and heavy laden with their leather cases under the August sun.

W. SCALING.

Nottingham, January 14th.

BRIXTON AND CLAPHAM CAMERA CLUB.—On Friday, 3rd inst., the President, Mr. A. R. Dresser, gave a new year's address, and showed a number of enlargements from hand-camera negatives taken during a recent tour in Brittany, and also about a hundred slides which were exhibited by means of the oxy-hydrogen lantern. A show of photographs, the work of members, will be held on Monday evening, 20th inst., from 7.30, and also all day on Tuesday, 21st, at the Club Rooms, 35, Bedford Road, Clapham, S.W. Visitors are invited.

FATHER PERRY.—A private telegram has been received at Liverpool from the Catholic Bishop of Demerara announcing the death on Friday last in British Guiana, of dysentery, of the celebrated Jesuit astronomer, Father Perry. Father Perry, who was born in London, was in his fifty-eighth year. In 1882 Father Sidgraves, another Jesuit, was delegated by the Government to report on the transit of Venus, and last year the services of Father Perry were again requisitioned by the Government to report on the solar eclipse. It was on this expedition on the coast of Guiana that Father Perry fell ill, and has now fallen in the midst of his scientific labours.—*Daily News.*

* PHOTOGRAPHIC NEWS, p. 835, of last volume.

Proceedings of Societies.

CAMERA CLUB.

THURSDAY, January 2nd, was a lantern evening at the Camera Club, and there was a large attendance of members. The chief part of the exhibition consisted of a selection from a number of slides lent by the Birmingham Photographic Society. After these, other slides were shown by Mr. T. Charters White (general landscape and microscopic), Mr. Frank Howard (landscape and landscape with figure), Mr. Rooper Leventhorpe (pictures taken in North Italy), Rev. C. F. Fison (English country scenes), Mr. F. Howlett (a series of views on the Thames), and in conclusion a set by Mr. J. B. B. Wellington, of landscape and landscape with figure. Some of Mr. Wellington's slides were especially effective, and attracted much attention.

The subject for Thursday, January 16th, is "Plane Polarization of Light," when an address will be given by Mr. R. Tindall. The lecture will be illustrated; meeting at 8 p.m.

EAST DULWICH AND PECKHAM PHOTOGRAPHIC SOCIETY.

THE above Society held its first annual exhibition on Friday, 3rd inst., in Shawbury Hall, Lordship Lane, when a large number of visitors testified their appreciation of the first fruits of the Society. Running briefly through the exhibits, the work of Mr. Edwards, the President, of course attracted notice. His set included the celebrated gold medal picture, "Woolpits," the residence of Sir Henry Doulton, and a very fine picture of Lambeth Palace from the river. As, however, Mr. Edwards refrained from competition, other exhibitors were able to view the appreciation of his work with becoming equanimity. The Vice-President, Mr. Howell, showed a series of forty-year old Talbotypes. Mr. Gardner exhibited a frame of lantern slides of "bits" at Hastings, which were favourably received when passed through the lantern later in the evening. Mr. Rice was represented by a fine collection of platinum prints—views of the Temple Gardens, Kew Gardens, and places of local interest—which were admired for their sharpness. Mr. Kelly's contribution consisted of a series of fine views of Scottish scenery, most of them in Oban. The cloud effects in these pictures were admirable. Mr. Kirby showed very satisfactory results of the summer outings in the shape of pictures of Surrey scenery. Other members also exhibited good work.

After time had been allowed for the inspection of the photographs, the Society's lantern—a fine specimen of Pexton's Grand Triple—was requisitioned, and some effective lantern slides were shown by Messrs. Gardner, Farmer, Exner, Dowling, and Boydell, after which the president announced the results of the competition. Mr. Kelly secured the silver medal, and, as Messrs. Rice and Dowling dead-heated for second place, the former took the bronze trophy, and an extra medal was awarded to Mr. Dowling. First and second certificates were awarded to Messrs. Kirby and Boydell respectively. It was intended to give a certificate for the best set of lantern slides, but, in the opinion of the judges, the work of the five competitors mentioned above was so equal in merit that it was decided to withhold the certificate. The prizes were presented by Mrs. Banks, wife of the treasurer.

The proceedings were diversified by vocal and instrumental music.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second ordinary meeting was held in the Professional Hall, 20, George Street, on Wednesday, December 4th, 1889; the chair was occupied by Dr. DRINKWATER.

The following candidates were admitted as members of the Society:—Messrs. Wm. M. Ramsay, Philip R. D. Maclagan, William Burn, James Hay, Robert Irvine, J. Rymer Paterson, and William G. Tait. Five gentlemen were nominated for election at the January meeting.

Mr. HUGH BREBNER then read a paper on "Repairing Broken Negatives" (see page 20) and accompanied it with a demonstration.

Mr. M'KEAN said that if the broken negative were covered with tissue paper, and the light allowed to fall in the direction of the fracture, the print would be only slightly marked. While recognising the value of Mr. Brebner's remarks, he thought that a negative must be a very valuable one before a photographer could afford to take up so much time in repairing it if it got broken.

Mr. MITCHELL said, with reference to joining the detached pieces of the film, he found he could scrape a film down more uniformly at the juncture when he rubbed it over with the retouching medium before commencing that operation upon it. His difficulty was to intensify a negative which had been treated in the manner described.

Mr. AYTON said he would be inclined to differ slightly from Mr. Brebner's procedure. The most of his (Mr. Brebner's) difficulties were caused by the expansion of the gelatine film, and could be obviated by using methylated spirit, and specially hardening the film. His own method stated briefly was—if the broken negative were varnished, remove the varnish with methylated spirit and ammonia, wash out the spirit, soak in chrome alum, dry, immerse in a weak solution of fluoric acid to loosen the film off the broken glass, wash out the acid, put the loosened film into methylated spirit, and finally place the pieces in position on a new glass. It would be found that the negative did not require intensification.

The CHAIRMAN called for a vote of thanks to Mr. Brebner, a motion which was cordially responded to by the members present.

The specimens of members' work, which had been hung on the walls by Mr. Stewart-Smith, were then inspected by the members present.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held at the Masonic Hall, Surrey Street, on Tuesday evening, January 7th, Mr. B. J. TAYLOR in the chair. It was agreed, on proposal by Mr. Councillor Thos. Firth, seconded by Mr. B. Nowill, that a lantern exhibition be held early in February for the benefit of the public hospital and dispensary.

Mr. H. STANIFORTH presented the Society with one of his patent limelight regulators.

Mr. PRESTON gave a practical demonstration, showing the different lights for the optical lantern—viz., the three-wick lamp, with luxor oil, the oxy-hydrogen, and the ethero-oxygen. The two latter were thought to be about equal in brilliancy, the oxy-hydrogen the best for safety, and the ethero-oxygen the most convenient for giving exhibitions in country villages where the ordinary gas is not to be had.

DEVON AND CORNWALL CAMERA CLUB.

THE Devon and Cornwall Camera Club held their first lantern-slide competition on Monday evening, at the Club Rooms, Athenæum, Plymouth. Mr. R. Murray took the chair, and the hon. treasurer took charge of the club lantern, projecting a fourteen-foot disc upon the screen at the end of the hall, brilliantly illuminated by limelight. A numerous and varied assortment of lantern slides was then shown in rapid succession; and on examination of the voting papers at the close, it was found that Mrs. Carnell had been awarded first prize with 61 votes; Mr. R. Murray taking the second prize with forty votes. A number of slides made by Mrs. Carnell, Messrs. Micklewood, Murray, and others, were afterwards shown, some being copies of "Leech's Sketches in *Punch*," creating great amusement.

After the close of the competition, the hon. treasurer, Mr. A. A. Carnell, was heartily congratulated on being the winner of the gold medal given by the Britannia Works Company at the "photography" competition, for the best six lantern-slides on Alpha plates, in Class X., scientific micro-photography, and for also winning a silver medal (equal first with Mr. F. H. Exans) at the same competition. This competition, held a few weeks back, was open to the world, and nearly 18,000 slides were sent in for competition.

ABNEY CAMERA CLUB.

ON 3rd inst., the VICE-PRESIDENT in the chair, Mr. FLACK gave a demonstration on bromide paper printing.

In referring to developers, he said that he preferred hydroquinone, it being less trouble to manipulate. For light, he usually employed magnesium ribbon, burning one inch at about eighteen inches distance, with a plate of opal glass in front of the negative.

At the close, he developed several prints, some with ferrous oxalate, and some with hydroquinone, the opinion of the members present being that the tone given by the former on Ilford paper was preferable.

After the usual vote of thanks, the HON. SEC. announced that on Jan. 17th he had promised to read a paper on the "Chemistry of Photography."

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held on December 4th, 1889, with Mr. FREDERICK GRAFF in the chair.

After the transaction of routine business a paper was read by Mr. THEODORE H. LUDERS, "On Development with Pyrogallic Acid in connection with Ammonia in Vapour," and Mr. Morris Earle showed some novelties in photographic appartus, which he had collected during a trip to England and the Paris Exhibition. Among these, he described a panoramic view camera which he had seen in Paris. A film or paper negative was used, and bent into a semicircle with the lens in the centre. By a lever on top of the camera the lens could be revolved so as to cover different portions of the plate successfully. The light was admitted to the lens (which was of fixed focus) through a diaphragm in front in the form of a perpendicular slit, the opening revolving with the lens as it was turned. A unique feature possessed by the camera was the fact that if in one portion of the view dark objects predominated, requiring long exposure, the lens could be allowed to cover that portion of the view for a greater time, and less exposure be given to the brighter parts of the view, simply by properly manipulating the lever attached to the lens.

Mr. JOHN G. BULLOCK called attention to the late explosion of flash-powder in this city, with its terrible result in the death of three persons. He thought it right that the published minutes of the Society should caution all to look with distrust upon flash-powders of a yellow colour, and if they prove upon examination to contain picric acid along with powdered magnesium to consider them highly dangerous. Picric acid upon standing in mixture with powdered magnesium for a length of time is supposed to form picrate of magnesium, a highly unstable combination more dangerous than dynamite. A person finding a vial of such flash-powder in his possession had best dispose of it at once, but with great care. He is advised against pouring water upon it or burning it, but rather to throw the whole vial into a river or down some gorge where it would be scattered without doing harm. The very act of removing the cork from the bottle might be attended with serious results. The danger of picric acid flash-powders increases with age.

Dr. MITCHELL fully agreed with Mr. Bullock, and considered all flash-powders, except those composed of pure magnesium, more or less dangerous, differing only in degree. Magnesium has a tendency to absorb moisture, in which state it readily combines with picric acid, forming the dangerous picrate of magnesium. Even a single ounce of such powder would be exceedingly dangerous.

Mr. ROSENGARTEN called attention to a method of preparing ground glass for focusing screens by the use of hydro-fluoric acid in combination with carbonate of soda.

Dr. WALLACE spoke of the use of a solution of plain boiled starch spread upon a plate of glass, and allowed to dry, thus forming a very fine surface for a focussing screen.

Mr. WOOD described a method of focusing without the use of any screen. If the position to be occupied by the plate is determined by a metal strip located in the usual position of the ground glass, by placing a focusing glass against this strip it will show (over a limited area, of course) the image usually projected on the screen, and a proper focus can thus be readily

obtained. A piece of plain glass can also be used in this manner as a support against which to place the focussing glass.

Dr. MITCHELL asked the experience of members in regard to films, stating that he had found some rolls to be very good, and others not. He had noticed markings like long transparent lines, as though scratched with a needle.

Mr. LUDERS suggested that they may have been damaged in unpacking.

Mr. WOOD stated that he had lately returned from a trip of over a thousand miles on which he had used films, and his feeling was that hereafter he preferred the weight of glass to the uncertainty of films. He thought nothing had yet been discovered to equal the perfect surface of glass, and the certainty of its results.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE regular monthly meeting was held on December 10th at 122, West 36th Street, Vice-President DAVID WILLIAMS in the chair.

Mr. A. PEEBLES SMITH read a short paper on "The History of Flash-Light Photography," illustrating his remarks with lantern slides, all of outdoor flash-light pictures and interiors of theatres. He said that he had invented a safe powder, especially in bringing out the greens and reds.

Mr. G. D. MILBURN took a flash-light picture of the audience, using the new No. 2 Kodak camera, making a circular picture of 3½ inches. He also explained the instrument, which has a very simple shutter, and a fixed focus lens. Before the evening was over he made a lantern slide from the negative, which was thrown on the screen.

Miss CATHERINE WEED BARNES read a paper on "Photography from a Woman's Standpoint." She is the first woman who has ever read a paper before a photographic society in the United States.

Mr. JAMES H. STEBBINS, Jnr. showed photographs of a pinhole sensitometer device he had used in testing sensitive plates. His results were very instructive. He also gave the result of his experiments on the solubility of "eiko." in distilled water at different temperatures.

Mr. F. C. BEACH exhibited Eastman's transparent film negatives (instantaneous exposures) developed with the "Ultimate Single Solution Eiko." developer sent by Messrs. Queen and Co., of Philadelphia, and of the ordinary eikonogen two-solution developer. The latter gave more density, and worked more quickly.

Mr. HENRY J. NEWTON made a few remarks on a mixed hydroquinone and eikonogen developer. The eikonogen, he contended, was slower than hydroquinone when a caustic alkali was used with the latter.

A lantern slide exhibition, illustrating New York and Paris Exposition, is to be given by the Society at Chickering Hall, New York, February 5th.

THE Solar Eclipse Expedition to South America from the Lick Observatory has telegraphed, we read, that their observations of the solar eclipse on December 22nd were entirely successful.

RECEIVED.—Sample bottle of Tylar's plate backing, which is to be applied either with a dabber enclosed, or preferably with a roller squeegee. When dry—which is the case in a few minutes—the plates can be placed in the dark slides. Before developing the plate, the backing is removed by using a sponge and warm water.——"The Magic Lantern—its Construction and Use," published by Perken, Son, and Rayment, is a welcome addition to the instructions on a subject of more especial interest at this season of the year. The book is divided into fourteen short chapters of useful information comprised in small compass.——"Photographic Scraps," issued monthly, gratis, by the Britannia Works Company, and from which we have on several occasions quoted valuable "bits," appears as a double number this month.

LONDON AND PROVINCIAL.—Report received too late for insertion.

Answers to Correspondents.

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

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

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

C. G.—Old ferrous oxalate developer. The thick deposit formed in your stock-bottle is probably due to the separation of the ferrous oxalate itself. If so, you have only to pour off the clear top liquid, add just enough of a saturated solution of neutral potassium oxalate to redissolve the precipitate, and pour back again the main bulk of developer into the stock-bottle. Thus fortified, it only requires to be filtered, and is ready for use.

ALPHA.—Zincographic reliefs, &c. See answer to E. L. last week; there is also Dr. Schnauss' work recently published (see advertisement on page xii. last week). Two special articles, by Mr. W. T. Wilkinson, in the YEAR-BOOKS, will be of interest to you: these are "Photo-Engraving on Zinc," 1887, p. 53, and "Printing on Zinc in Bitumen," 1888, p. 75.

VAL. JACKSON.—The new general catalogue of Brin's oxygen and compressed gas appliances duly to hand. Templeton's and Lennox Browne's oxy-hydrogen lamps, and the lime-light projector, cannot fail to be useful to photographers.

W. C. HUGHES.—We thank you for sending the particulars of ether saturator to our correspondent at Charlbury.

W. B. (Reigate).—Meldola's naphthol acid is only very slightly soluble in alcohol, but dissolves freely in an aqueous solution of sulphite of soda. It might be worth while trying to dissolve it in alcoholic ammonia, but such a solution would not keep very long.

D. O.—We are glad to learn that our efforts were successful.

T. F.—You are probably aware that the ordinary terms for taking a portrait do not usually cover for possession of the negative. All will turn upon your having a written or special agreement about the delivery of negatives. This point settled, your course of action is quite clear, but not otherwise.

COLLOTYPE.—1. Husnik's substratum. A mixture of albumen and silicate of soda cannot be expected to keep good for any length of time; it had better be made fresh as wanted, unless you coat at once a number of plates. 2. This is rather a matter for experiment. If you *must* push on the successive stages of the process as quickly as possible, you might find it advantageous to add a small quantity of chrome alum and acetic acid to the other ingredients when preparing and sensitising the gelatine.

C. S. T.—Letters received and answered by post.

E. A. C.—The advertisement column should be resorted to for announcing your press for sale, and the fact that you give lessons on the working of the photo-mechanical processes.

A. J. S.—The first spools of Eastman tissue on flexible celluloid were sent out on New Year's Day. Yours ought to be on the road, if not actually received by this time.

C. M.—An amyl-acetate standard lamp, with pure silver wick-holder (Mr. C. H. Bothamley's modification), was described in the NEWS of 9th August last.

S. W.—It is already to be had. See advertisement at head of page xi. last week.

L. F.—Mr. H. P. Robinson begins the January number of the *Art Journal* with a chapter on the value of photography for the purposes of Art illustration, and Captain Abney is to follow. Now that all the English and American illustrated magazines and journals are depending so much upon the photographic processes, the subject assumes great importance. Even the *Vienna Weekly News* comes to us beautifully printed in English, and with a fine photo-reproduction of a Tyrolese scene—a view of Gries, near Bozen.

A. M. M.—Received; an answer shall be sent by post.

J. A. C., J. C. S., and other correspondents received.

The Photographic News.

Including Postage to any part of the United Kingdom:—
Yearly ... 15s. 0d | Half-Yearly... 7s. 8d. | Quarterly ... 3s. 10d
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THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1637.—*January* 17, 1890.

CONTENTS.

BASKET-WORK IN PHOTOGRAPHY.

BEFORE this subject is allowed to drop for a time, it may be well to point out to those photographic tourists who have not given attention thereto, some practical points worthy their attention. A basket-case should be so made that it can be used like a portmanteau in towns, and like a knapsack in the country, and should be furnished with locks and keys, so that it can be left in cloak-rooms at railway stations. Straps with fastenings and small padlocks are convenient for locking. The ordinary handles of a basket do not look well when the latter is carried knapsack fashion; there is something incongruous; like the red tails of the soldier's coat which organ-grinders give their monkeys, the coat-tail and the natural tail of the monkey do not harmonise. An actual maker of knapsacks for some members of the Alpine Club and others—Mr. Price, of Great Marylebone Street, London—has devised an excellent handle, consisting of a piece of bamboo covered with leather, and with a leather loop at each end; the straps supporting the knapsack pass through the loops. This round rigid handle gives great ease in carrying the case as a portmanteau, and can be slipped off and put inside when the case is used as a knapsack.

The basket case should be narrow, flat, and long, for the same reason that leather cases for photographic apparatus are now made narrow and flat. It is convenient to have the case long enough to take the folded legs inside, along the top. The straps should be so made that the case comes high up on the shoulders, otherwise a tiring, "dragging" feeling results; and in front of the shoulders the strap should be very broad; in fact, one inventor has patented a kind of web to come instead of the strap at this particular place. In knapsacks the straps should never cross or pass in front of the breast.

One basket-maker told us that the English cannot make the elegant palm baskets turned out by the French; another wrote in these pages last week that they can do so, but do not. In any event, that is the class of basket, but of different shape and lighter make, which hereafter will come into use with photographic apparatus, and who the makers may be concerns the basket-manufacturing trade more than it does photographers.

THE PHOTOGRAPHIC SOCIETY OF NANTES.

LAST week some particulars were published in this journal in relation to Havre as a place easily reached from London, and admirably adapted to meet the requirements of landscape and architectural photographers, so soon as a boat service at regular hours, and several times a day, shall have been established across the mouth of the Seine to Trouville. From the latter place the banks of the Loire and the central French wine districts are in communication by rail, but chiefly by local lines, which cross several of the great trunk railways of France. The only trains at present running somewhat long distances almost directly south from Trouville are those between Caen and Le Mans, and can only be reached from Trouville by waiting about at junction stations. Were this not the case, and were Le Mans in direct communication, by boat and train, with Havre *via* Trouville, instead of with Caen, the route would be an excellent one for those English who have but a few days to spare, to reach the region of the lower reaches of the Loire, and to change the fogs and rains of London at the present season for the bright, cold, sunshiny weather of the Loire valley. The stretch of country between Tours and Nantes is so little visited by English tourists that through tickets thereto are not issued by British railway companies or tourists' agencies.

In the west of France photographic societies are rare. A photographic club was established at Havre last year, and Nantes has its photographic society. We are not aware of the existence of any other photographic organisation in the extensive region between these two places.

The *Société Nantaise de Photographie* has its studio and laboratory at Passage Raymond 9, Nantes, and was founded in April, 1881. At its start it had twenty members, but the number steadily increased. In the second year of its existence it began to organise a "regional" photographic exhibition, and in 1886 it invited all the photographers of France to the Photographic Exhibition at Nantes, an exhibition which more than fulfilled the expectations of its promoters. At the present time the Society has 142 members. Its laboratory for the free use of its members has been established three years, and there is a studio adjacent

thereto. The Nantes Society does not publish what may be strictly termed a *bulletin*, but every month it sends to its members a printed report of its meetings, followed by divers formulæ, and a variety of extracts from photographic journals, all contained in four large pages. It has an English correspondent, Mr. A. Seouman. The president of the Society is M. Bascher; vice-president, M. du Hanlay; treasurer, M. Tassain; secretary, M. Tremant; co-secretary, M. Jollan de Clerville; librarian, M. du Minchy. Sometimes the Society issues a photo-mechanical or other print with its monthly report. We noticed, while looking through the collection in the bureau a few days ago, that occasionally in past years some aristotype prints have been so sent out; how these latter will look nine or ten years hence is a question the future will solve. The Nantes Photographic Society works in correspondence with the Photo-Club of Paris, the Versailles Photographic Society, the Photographic Society of the North of France, and the Artistic and Photographic Society of Limoges.

In its monthly reports we read that a photographic society has just been formed in Auvergne, with its establishment at Clermont-Ferrand, cours Sablon 55. In describing its constitution, M. Félix Gaude, the president, drew attention to one of the rules which promised to welcome all photographic tourists at Clermont. Unhappily, says the report of the Nantes Society, another article informs the said tourists that they must pay ten shillings towards the expenses of the Auvergne Society if they desire to make use of the laboratory. The Nantes journal adds :—"Hospitality is not Scotch at Clermont-Ferrand," which French expression of opinion about the Scotch may be interpreted in two different ways, when compared with the statements which caused it to be brought forth.

The Nantes Society has just resolved to buy an optical lantern for a double purpose; that is to say, it will be used at the meetings of the Society for the projection of lantern pictures, and at other times it will be placed, under certain conditions, at the disposition of any individual member who desires to exhibit his slides for the amusement of his friends.

A committee of the Nantes Photographic Society has just sent in its report on the Paris Exhibition of 1889. It says that broadly speaking, there were no great novelties at the Exhibition, no indisputable advance marking a point of new departure. Improvements, however, were numerous, and the merit of the pictures exhibited by the great masters in photography was beyond all praise. Several amateurs also exhibited, and their work was good enough to satisfy the most fastidious. The most striking displays made at the Exhibition by photographers were those of Messrs. Chalot, Lumière, Van Boch-Boyer, Pérou, Walery, and Nadar. Some platinotypes upon Japanese paper, put on view by Chalot, are described by the committee as "one of the most ravishing exhibitions." Nadar's show was the most expensive and elaborate connected with the Paris Exhibition; it cost the firm 30,000 francs.

SENDING PICTURES AND WRITING BY THE ELECTRIC TELEGRAPH.

BY F. H. VARLEY, M.I.E.E., F.R.A.S.

THE transmission of autographs and written messages, or portraits, through telegraph circuits, is of itself no new feat. In the early dawn of practical telegraphy we have the invention of Bakewell. Those who are more particularly interested in this invention will find it described in the writings of Dr. Lardner, and in Golding Bird's "Natural Philosophy."

Bakewell's apparatus consisted of two synchronous clocks, which caused a style made of fine iron wire to rotate over a plane made of prepared paper supported on a metal base; during each revolution a continuous impelling movement was given to the arm carrying the style, so that instead of moving in a circle, it traced a series of gradually expanding volutes whenever a current of electricity was made to pass. The paper received a mark or line in Prussian blue, produced by the electro-chemical action set up between the iron of the style and the paper chemically treated with a solution of ferrocyanide. To transmit a message or design, all that had to be done was to write or scratch with a pointed style upon a varnished metallic surface in order to remove those portions in a similar way to preparing a plate for etching. When this was done, the transmitting plate was fixed down upon the bed-plate of the transmitting instrument. The clockwork of both the sending instrument and that of the receiving instrument at the distant station were started simultaneously. As the contact style of the sending instrument passed on to the bare metal, a current was established; this current being conveyed to the iron style of the receiving instrument passed to earth by conduction through the chemically-prepared paper, and produced a Prussian blue mark corresponding to that of the scratched or removed portion of the varnished surface of the transmitting plate. As the arms of both the sending and receiving instruments swung round at equal rates, tracing a series of volutes, beginning near the axis, and finally ending at the full diameter of the plate, it is readily seen that, as the blue mark depends upon the electric circuit being closed, such blue marks will correspond to the removed portions of insulating varnish of the transmitting plate.

Since the time of Bakewell not much had been done until 1863, when Casselli made a series of highly interesting experiments with a much improved apparatus. The chief feature of Casselli's apparatus consisted mainly in regulating and controlling the speed of his apparatus, so that both sending and receiving instruments were made to beat in unison, also that the ruling was in straight or parallel lines. This apparatus was established on one of the London to Liverpool circuits of the Electric and International Telegraph Company, and continued to work for some time very satisfactorily. Music scores, autographs, portraits, sketches, and bills of lading, were sent with unerring fidelity. The transmitting plates being mostly responsible for any of the vagaries, I enclose some of these pictures, which, as they are the only specimens I possess, I will ask you to kindly return them after inspection :—First, a sketch portrait of the late Prince Consort; second, a sketch portrait of a Turk; third, agricultural scene; fourth, a note of introduction, with portraits, front view, and profile of the person to be introduced.

I think it is very desirable to keep these results on record, as they undoubtedly form very important stepping

stones to the advancement of this subject, and from what I gather from the description of M. Ginochio's anto-telegraph, in your issue of the 3rd inst., I should imagine it to be actuated by an equivalent mechanism, though whether it is an improvement upon the work of Casselli, it is impossible and premature to judge. But, remembering that in 1863 photogravure was non-existent, and the artist employed to make the transmitting plates was only just learning his work, I think we may say that Casselli made not only a very practical demonstration, but also an important step in the advancement of auto-telegraphy.

With improved mechanism and plates prepared by one of the photogravure processes, I see no difficulty in producing and telegraphing highly finished works of art. Then the next question comes:—What about the commercial aspect? Why did the press not support Casselli in 1863? The answer may be that illustrated literature was not so general as now, and the time not ripe for its full appreciation; but with the new journalistic ventures, such as the *Daily Graphic*, which doubtless will meet with many competitors, it may become—and doubtless has become—an absolute necessity of the age, rendering it expedient to take this work up again from a fresh standpoint, beginning where Casselli had to leave off from want of proper encouragement, appreciation, and support, and to so develop the process as to make it perfectly reliable and correct in the minutest details. The undertaking is one involving a considerable expenditure of time and money, but that should not be an obstacle to so important an achievement in these days of advancing enterprise.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—The Annual Exhibition will be open for two days only, but it will be very representative, as nearly 400 exhibits have been forwarded, ranging from about 20 by 16 to quarter-plates.

HASTINGS AND ST. LEONARD'S PHOTOGRAPHIC SOCIETY.—In a notice last week of the Exhibition to be held in February, the address of the hon. secretary was incorrectly stated. It should have been Mr. A. Brooker, Memorial Buildings, Hastings.

FRENCH ECONOMY.—The medal question at the late Paris exposition seems to be giving no little dissatisfaction. It seems that the awards were numerous enough to satisfy everyone, but to get an award was one thing, and to get the medal awarded another. The managers of the exposition issue certificates of the awards, but the lucky (?) exhibitors can only get the certificate honoured by paying for the article thereby represented. Every successful exhibitor must pay the full value of the gold or silver medal which he in his ignorance of French usage supposed he had honorably gained.—*The Beacon*, Chicago.

THE SWING BACK.—Of all the contrivances about a camera, none perhaps is so often misused as the swing back. Many a time its employment would have been more honoured in the breach than in the observance. To have a swing back means that it must be used on all occasions, whether the taking of the building demands its employment or not. What is of more importance than tilting the camera and applying the swing back, is keeping the camera level wherever possible. Do not tilt and use the swing back every time. Very often a better view of a high building can be had by levelling the camera at the building from a window at a suitable height opposite. Determination of the proper lens is of the greatest importance in architectural views—what focal length will best secure the object in proper proportion. It is well to use a wide-angle lens which covers a plate the next size above; for instance, if the view is to be on a $6\frac{1}{2}$ by $8\frac{1}{2}$ plate, use a lens for 8 by 10. With such a lens we can raise the front without straining. A swing back, however, is like a Texas revolver—rarely needed; but when that rare time comes, it is needed badly.—*American Journal of Photography.*

A BIOGRAPHY OF J. H. SCHULZE.

BY JAMES MEW.

THE already announced inventor of photography, John Henry Schulze—or Johann Heinrich Schulze, to give his exact German name—was one of the most able physicians and distinguished philosophers of the eighteenth century. He was born—or, as his German biographer expresses it, "first saw the light of this world"—on the 12th May, 1687, at Colbitz, in the Duchy of Magdebourg in Prussia, in the house of a poor tailor. His father (Matthäus) supplemented a precarious income derived from the reseating of breeches, with the nurture of bees. It is possible that his son's name would never have been enrolled in the blazoned annals of medical and philosophic fame—for the father's purse held no quantity with the son's abilities—had it not been for the exertions of a certain Andr. Albr. Corvinus, the pastor of his native hamlet, who first made John Henry's acquaintance at the immature age of six, learning his accidence in the village school.

Corvinus took young Schulze to himself, and the boy, besides sitting down at the intellectual feast of the village pastor, was careful to pick up such stray crumbs of learning as fell from the table of his children's education. In this desultory manner he seems to have taught himself the rudiments of Greek and Latin. On a day came Corvinus into his garden, and lo! his *protegé*, forgetful of fruit and flower, lost to the outer world of sunshine, was buried deep in the pages of a Greek Testament behind the paternal bee-hive! The good priest, delighted with the sight, made him a present of the book out of hand; and who then was happier among articulately speaking men than John Henry? All the time he could spare from his regular course of study he devoted to the Evangelists, collating, comparing, and criticising with his 'prentice-brain their textual anomalies and variations; and, after the fashion of Browning's Grammarian, weighing with minutest care the relative forces of *men* and *de* and *oun*.

At the recommendation of Corvinus, Schulze was received as a pupil at the Royal Pædagogium, in the University of Halle (Friedrich's-Universität) in 1697. As he was one of the earliest, so he became one of the most distinguished scholars of that seat of learning. Afterwards he was admitted, without pay, a pensioner of the Orphans' Home in the same town. The head master of the Pædagogium—the famous theologian Franke—following the good example set by Corvinus in the matter of young Schulze, loaded him with benefits—moral, intellectual, and physical—for the full space of twenty years. It is rare, indeed, to find a Mecænas in this work-a-day world; the fortunate Schulze found Corvinus and Franke. Without such happy chance, where would have been our young philosopher and adolescent physician? Blushing unseen, most probably, and wasting his sweetness on the desert air, as so many embryo poets, painters, philosophers, and physicians have done before Agamemnon and after.

In 1701, Schulze seized the forelock of opportunity, and made acquaintance with a language of the East. One Solomon Negri, a learned Arab from Damascus, at the importunate request of Franke, consented to stay a year's space at Halle to give any pupil who wished it, the profit of his instruction. Schulze was one of the first volunteers, and for that whole year learnt nothing but Arabic. After Negri had returned to his own place, Schulze studied for some time medicine at the University under the direction

of the then celebrated Professors Stahl, Richter, and Eckebrecht.

His thirst for varied knowledge was not yet assuaged. He proceeded to dive into antiquities and philology under the experienced guidance of Christopher Cellarius. From time to time, however, he returned to his old Eastern loves, encouraging these pursuits with an occasional attendance at the Oriental lectures of Michaelis, and studied Syriac, Chaldee, Samaritan, Æthiopic, and Rabbinic. He learnt Romaic at the feet of Anhard Adlung, from Constantinople, who lent him several rare books in that language published at Venice and Bucharest. He also learnt Turkish from the same master.

In due course, Schulze became, in the year 1708, a Master of the Pædagogium, and in 1715 was employed as a secretary by the well-known physician Fred. Hoffmann, the Boerhaave of Germany. This accident seems to have determined his errant inclinations ultimately in favour of medicine—though we still find him reading in his intervals of leisure such erudite fathers of the Church as Gregory and Nazianzen, whose works, it is said, he studied completely, adding thereto the greater portion of those of Basil.

Under the guidance of Hoffmann—the Hippocrates of his period—who treated him with no less liberality than Corvinus and Franke had done, in the free and cheerful giving of such intellectual stores as he possessed, and initiated him, moreover, into all the valuable secrets of his art, Schulze felt himself, after two years' labour, strong enough to sustain the theses required for his degree of Doctor. His dissertation on "Athletes, their Habits and Diet," obtained for him permission to practise in medicine. He continued his practice at the University till the year 1720, when he accepted the position of Professor of Anatomy at the University of Altdorf. His old and early patron, Corvinus, had set the crown on the previous benefits bestowed on his favourite pupil by giving him his daughter Johanna Sophia to wife, in the year before his election to the anatomical chair.

Schulze sat in this chair some dozen years, and published therefrom his "History of Medicine," which at once placed him in the first rank among his medical compeers. This work was, however, never finished. In 1729 he became Professor of Greek, and later on Professor of Arabic. These professorships interfered much with his medical duties, and the interference was strengthened by his appointment in 1732 by the Prussian Government to the place of Professor of Eloquence and Antiquities in his old University of Halle. His first exercise in this new department of literary activity was a treatise on the much-debated line in Virgil (Æn. xii, 397):—

"*Mutas agitare inglorius artes*,"

which has caused so great disagreement among the learned.

But still Schulze's circle of study was not sufficiently wide for his own convenience. Numismatics now engaged his attention. He collected a large number—some 3,000—of ancient coins and medals, of which Gottlieb Agnether published in 1746 a *catalogue raisonné* with the title of *Numophylacium Schulzianum*.

Schulze's abnormal intellectual energy can best be comprehended by an allusion to some of his multifarious labours. Taking them at haphazard, we meet first with some philological observations on a Greek verb signifying to worship. Next we have a treatise on the condition of the medical slaves (strange expression in the light of our nineteenth century civilization) belonging to the Greeks and Romans. Then a little talk about the Goddess Victory and a particular altar belonging to her; then a medical lexicon; then a translation of Plutarch; then an essay on the Ancient's Hellebore; and then a literary geography, and so on to the number of 166 separate works.

Schulze joined to extraordinary diligence extraordinary ability. He was continually, as the reader who has gone through this biographical sketch may readily believe, engaged in reading, writing, and studying. His excessive application to his books injured his health. He contracted various diseases, of which has been published a minute and unpleasing description. In the Eastertide of 1744 he died, or, as his German biographer prefers to put it, "changed the temporal for the eternal; a truly unspeakable loss for all who knew him."

BROMIDE ENLARGING AND PRINTING.

MAKING bromide enlargements is a work so popular among photographers at this season of the year, owing to the facility of carrying it on by artificial light, that the record of experiences from various sources is sure to be interesting to our readers. We therefore subjoin extracts from articles on the topic, the first being by Mr. D. G. Milburn, in *Wilson's Photographic Magazine*.

A very practical business method, as practised by a New York photographer for introducing large pictures to the general customer, can here be mentioned, as it usually leads to a sale of a life-size portrait at a handsome figure. Every negative of a fairly good quality, after leaving the retoucher's hands, is brought to the bromide operator, and an enlargement is made from it. This plain print is then inserted in a ready *passepartout*, and when the customer calls for his small picture his attention is called to his enlarged bromide picture. He is informed by the salesman that said picture can be sold plain as it is, or can be finished in crayon, oil, or pastel, and specimens of the different styles are shown him, and, as before stated, a sale is usually accomplished. In case of no sale, the print is removed from the *passepartout*, and all the firm is out is the cost of the print, which is not over 60 cents for an 18in. by 22in. The same *passepartout* will answer for showing any number of enlargements in.

A mistake that often occurs with the bromide worker is over-timing, and then to overcome this mistake the addition of an old developer, or bromide of potassium, is resorted to. This is something all operators ought to be very careful to avoid, for an overtime print will never compare favourably with a print that has been timed correctly.

A very practical way of deciding on the right and proper time of exposure for any sized bromide enlargement is to adjust a small piece of bromide paper on the easel, after having focussed the enlarged image sharply, expose and develop, then use this as a guide for the final exposure. If daylight is the medium used to enlarge with, permit as little time as possible to elapse between the test and final exposure, as the light may change.

In case the enlargement is to be made from an over-intense negative, use less bromide of potassium than the formula calls for. On the contrary, if the negative is too soft and flat, an increase of bromide of potassium in the developer will make the proper contrast. Old developer should not be used for that purpose, as it has a tendency

to leave the print slightly yellow. The oxalate and iron developer has been proven to be the correct developer for bromide paper work, and the writer recommends it above all others. If bromide enlargements are to be made in large quantities, electric light will be preferable, as there is less variation in that light; with it Eastman's extra quick bromide paper will work the best.

Enlargements of sizes over 30 by 40 are best produced with daylight, and Eastman's standard paper is then recommended.

Any amount of crayon, oil, or pastel can be done on a bromide enlargement, and any one used to crayon work will require but very little practice to become proficient. But very little work is required on a good bromide print to make a highly finished picture.

The following is selected from a paper by Mr. J. Howson, read before the East Dulwich Photographic Society, and published in the *Photographic Societies' Reporter*:—

For enlargements each man is bounded by his facilities, and I will only sketch, therefore, the two methods available, leaving each to be guided by circumstances and surroundings which plan he will adopt.

First, daylight work. Here we need a dark room, with a window blocked up by a shutter; this shutter must have in its lowest part an opening the size of the largest negative to be enlarged from. At the bottom of the opening must be a shelf, on which to stand our ordinary camera at full stretch, if the size of our enlargement so needs it. Outside the window, at an angle of forty-five degrees, must be a mirror, or a board covered with white paper, to reflect the daylight inwards. A north aspect for this window is preferable, and direct sunlight very undesirable. Inside the room we want an easel; one of the most primitive kind will do, cabable of being readily moved and adjusted so as to be strictly parallel with the negative. Our lens, with which the original negative was taken, is in position in the camera, and that is all. Pin a piece of plain paper on easel, mark on it the size of enlargement wanted, put the negative in place of focussing screen, film towards lens; change relative position of negative, lens, and easel, until the image covers the size marked; replace the plain paper by bromide, taking care that the latter is well stretched and evenly level, and expose. There are exact rules as to the finding of these relative distances for each size of enlargement, but as they are found in all year-books, we need not discuss them, only mentioning that the farther from the lens the sensitive surface is, the larger the image, and *vice versâ*. In practice, a rectilinear lens gives better enlargements than a single one, and as large a stop as possible is preferable, as it facilitates focussing and shortens exposure; but, of course, the larger the plate proportionately to the lens, the greater the necessity for stopping down. Further, most negatives are wanting in definition at the edges, and also in most cases in interest; it is therefore advisable, in making an enlargement of, say, 12 by 10, to let the image on the screen be an inch or so larger; the resulting picture, on 12 by 10 paper, will be more pleasing and sharper, though not embracing the whole subject on the negative. Then, as to size of enlargements, as compared with size of negative, I think it is admitted that, to obtain most perfect results, we should not exceed three times—that is, a ¼-plate should be enlarged to 12 by 10, and no further. There are other opinions expressed on this point, but I am going with the majority. I ought perhaps to have mentioned before the class of negative to be used—a negative that will give good results on ordinary albumenised paper will give good results on bromide naturally; but I go further than this, and endorse the frequently expressed opinion that bromide is the "salvation of a poor negative," and say that a negative that is too thin to give a decent print on ordinary paper, will give a capital picture on bromide, with ordinary care; and even if you have a hard negative, presuming all detail is present, a very passable bromide print can be got. A negative tending to thinness and full of detail, however, gives the best results. These remarks apply, of course, equally to enlargements and contact prints, and, in the proper place, I shall say a few words as to the methods of correcting in exposure and development the excess or lack of vigour in the negatives from which we may be working. Now, as to exposure. Here we have four points to be considered—the variation of light; the density, or, speaking more correctly, the *printing value* of the negative; the focal value of the stop; and the size of the enlargement. The two first points are matters of pure experience, the third and fourth are subject to well-ascertained laws. As regards the size of picture, if the distance between negative and sensitive paper is two feet, and two seconds is found to be a correct exposure, then, when the distance is four feet, the exposure will be *not* double, but four times as long; the rule is, not proportionately as the distance, but as the square of the distance. As regards the focal value of the lens, this is dependent on the ratio the diaphragm bears to the focal length; a lens of 8in. focus, with a diaphragm of ½in. diameter, would give a focal value *f*/16, because the aperture is one-sixteenth the focal length, and the relative value of light passing through the several apertures is all laid down in the year-books.

Whilst it seems almost useless to attempt to give any standard of exposure, it may help workers to say that one of the 15 by 12 enlargements on slow paper was made at mid-day with a lens stopped to *f*/10, from a 5 by 4 negative, and nine minutes' exposure given. These times may be remembered as a guide for working. I have spoken first of daylight work because it entails the use of fewer appliances and less expense, whilst, at the same time, most of the remarks I have made apply equally to work done by artificial light. For this latter kind of enlarging it is impossible to work without some sort of lantern, or at least a condenser, for securing an equal diffusion of the light over the whole negative to be enlarged.

One prime reason why the best results cannot be always obtained by this method is, that most artificial lights are of a comparatively low intensity, and do not possess sufficient penetrative power to enable them to give the full gradation of tone in a vigorous negative. Therefore, a negative with strong contrasts should be specially avoided when working by artificial light, except unusual care is taken to modify results. In using lanterns for enlarging, it should be borne in mind that the light must be as intense as possible, and the flame not large—in fact, a perfect light for this purpose would emanate from a single point. Then as to condensers, these should be at least half an inch larger in diameter than the longest side of the plate to be enlarged; that is, a quarter-plate negative would need a six, or at least a five-inch condenser, and as these are expensive articles in the larger sizes, a suggestion made by a well-known worker is worth bearing in mind. He has only a four-inch condenser to work with, and therefore reduces his half and whole plates in the camera to lantern size, prints by contact a negative, from which

he enlarges. This is a roundabout way of working, but the plan is one to be remembered in case of need.

The remarks as to exposure which I made in reference to daylight apply here also, and I will, with the same reserve, say that a negative to be enlarged three times will need an exposure of two to five seconds, using Ilford rapid bromide, which is twenty times as fast as the slow kind. In any case, it is unwise to rely on these time standards without experience, and the plan usually adopted is to make tests by means of slips of the sensitive paper. Such a plan will save much paper and much disappointment. I will add only that the process is a comparatively simple one, and any worker who can be fairly certain of producing a decent negative will not find any difficulty in doing good work after a very slight practical experience; and the advantages of being able to reproduce larger pictures from good though small negatives are obvious to all, and need no comment from me.

On the subject of bromide printing, for directions in which inquiries are frequently made, the editor of the *Photographic Record*—the organ of the Amateur Photographic Society—writes the first portion of an instructive article, from which we make the following extract:—

For the amateur, bromide printing possesses many advantages over silver, and although we admit there are disadvantages also, such as the difficulty of combination printing, yet the comparison is greatly in favour of the bromide. One of the most important of these advantages is that it can be worked in the evening by gaslight, and, in consequence, is quite independent of the weather. Winter, with its gloomy days, makes no difference, except that the long evenings are a decided gain, and can be made to yield an additional pleasure. There is no necessity even to use the dark room, which is often a makeshift arrangement, and is cold and cheerless in the winter months, for, with the exception of the final washing, all the operations may be undertaken by the fireside in a sitting-room, or any other convenient apartment. Let us suppose that an ordinary sitting-room is used, which is illuminated by gas in the usual way. All that is required is to allow the fire to burn down to a red glow, to spread a newspaper or sheet of brown paper over the table, and place upon it the few bottles of chemicals, three dishes, and a measure from the dark room. A red lamp will be required on the table. One of the best is obtained by purchasing a small paraffin oil lamp, usually costing sixpence, and painting the glass chimney with two coats of light red oil paint. The light of this can be turned up or down at will. Two jugs, one containing clean water, will also be wanted; the empty jug is to receive the spent developing solutions. It will be an improvement if the gaslight can be placed low down on the table, by means of an india-rubber tube attached between the chandelier or bracket and a standard, such as is often used for reading purposes, but this is not a necessity. When all is ready, pour out some of the clean water into one of the dishes, mix the developing solutions in the measure, light the dark room lamp, and then turn down the gas very low. Place a watch near the lamp to check the exposures by. A sheet of the bromide paper should now be placed in contact with a negative in the printing-frame. The face of the paper is known by its tendency to curl upwards slightly, the emulsion with which it is coated causing a contraction of the surface. After seeing that the stock of bromide paper is carefully covered, the gas may now be turned up and the exposure made. For an ordinary negative, with Eastman or Ilford slow paper, an exposure of 1 to 1½ minutes at one foot from the gas is about correct: but if the negative is very dense it should be held closer, say six or eight inches away. The colour and quality of the negative must be judged prior to the exposure, or a test made by a slip of the paper. A stained negative being somewhat non-actinic, the light has difficulty in penetrating it, and a prolonged exposure is necessary. If the negative is thin and weak all over, as an over-exposed plate usually is, it will require to be placed further from the gas. Three minutes' exposure, at three feet from the light, will often give good results from this class of negative, but at times it is even necessary to considerably exceed this distance and time. A negative which has been under-exposed, and has portions very dense and other parts very thin, will require special treatment. The weak portion must be shaded while the dense parts are being held near the gas; afterwards it should be removed further from the gas, the shading material taken away, and the exposure continued for the thin portion. A piece of paper or cardboard, with a torn, irregular edge, and kept moving during the exposure, is suitable for shading purposes. Vignetting is nicely accomplished by cutting the required shape, slightly reduced, in a piece of cardboard, and, after fixing the negative at the proper distance, moving the vignetter backwards and forwards between the negative and the light. This will produce a soft edge. Daylight is very uncertain, the light being too intense; but with gas almost any variation in colour or density of negative may be successfully dealt with, by reducing or increasing the flame, the distances, or the length of exposure. Even the faint details in a thin negative, which cannot be retained in a silver print, can be shown very presentably by the treatment suggested.

After the exposure, the gas should be turned down till nothing but a small blue flame is seen on the burner; the printing frame is opened, and the paper immersed face downwards in the bath of clean water for about a minute. So that the water shall act evenly and air-bubbles be avoided, the paper should be drawn into the water by the edge, only the extreme edges of the paper being held by the finger ends. It should then be taken out and placed face up in an empty bath. The developing solution is now poured upon the paper, and the bath rocked freely to produce equal action of the developer. The time should be observed, so that an idea may be gained of the correctness of the exposure. Some developers are very slow. This is because the accelerator is weak and restrained, and, in consequence, it cannot be considered an ordinary developer, though it makes a pleasing tone. Something quicker is wanted for general practice if the work is not to become monotonous, and from a half to one minute should be sufficient to start the image. About three minutes should complete the development. The following is a good iron developer giving a purple-black colour free from strong contrasts, and is well under control:—

No. 1.—A saturated solution of potassium oxalate
Ammonium bromide, 3 drops to each 5 ozs. of the above.

No. 2.—A saturated solution of ferrous sulphate
Citric acid, 20 grains to each 5 ozs. of the above.

To make 2½ ounces of the above, take—

No. 1	1 ounce
No. 2	¼ „
Water	1¼ ounces

Nos 1 and 2 should always have a few undissolved crystals at the bottom of the bottles. Whenever any portion of No. 2 is used, the bottle should be filled up with water so as to exclude the air, and from time to time a few grains of citric acid added to prevent the iron from oxidizing.

If the picture shows signs of developing unequally, the dish should be tilted so that the solution may run off the fully-printed portion, and remain on the part which requires the extra development. Another plan is to pour all the solution from the dish before any part of the image is fully developed, and then work out the completion with a camel hair mop dipped in the solution. The dish should be elevated at one end while this is being done. When any part is finished, squeeze the moisture from the brush with the fingers, and pass it over the completed portion so as to absorb the solution on it and stay further action. The remaining parts should have additional solution supplied by the brush until a satisfactory result is obtained. Do not attempt to stop the development with water, or a degraded colour will be produced wherever it is applied.

When the development is complete, the print should be transferred to another dish to be acidified. The removal of a print from one vessel to another is greatly assisted by using the handle of a teaspoon to lift the edge of the paper. Especially if hydroquinone is used will this little help be appreciated, because this developer imparts a slippery feel to the print, and softens the texture of the paper. Care should always be used in handling, so as to avoid any abrasion of the surface.

L'Amateur Photographe is in the habit of saying that an illustration accompanies the number in which the said remark is made; the publishers, with equal regularity, invariably omit the illustration from the copy posted to us, and perhaps to others. This is as economical as the medal system at the Paris Exhibition.

THE ACTION OF ELECTRICITY ON IODINE.—In the course of a memoir on "The Long-continued Action of the Electric Discharge on Iodine," Dr. C. Luedeking, of Leipzig, says :—"In my experiment the disappearance of the element iodine was not due to any other cause than its uniting with the constituents of of the glass. Under the influence of the electric discharge, iodine certainly acquires superior chemical affinities, attacking the substance of the glass, and forming iodides, and, from the disappearance of one-fifth of the volume of gas, I should say also some iodates. To meet this eventuality, I reduced by sulphuretted hydrogen previous to precipitation."

SELF-LUMINOUS CLOUDS.—I am very sorry that I took no notes, some six or seven years ago, on the first and only occasion of my seeing self-luminous clouds, but though I can give neither date nor positions, the following facts are still fresh in my memory. Passing through Bushey Park after dark, I noticed an aurora borealis, and, as I had only recently seen the rather rare phenomena of the rays of the setting sun converging towards a point in the east, I followed the direction of one of the principal beams of light towards the south, when, at a point somewhat south of my zenith, I noticed an equatorial belt of luminous clouds. I found that each cloud belonged to a ray, and faded and brightened with it, but was separated by about 60° of clear sky. This belt of clouds extended down to the western horizon, the eastern one was obstructed by trees, while shortly afterwards small dark clouds appeared on that side, and the sky soon became overcast. The luminous clouds were quite transparent, so that even faint stars could be seen through them when at their brightest. I have heard from Scandinavian captains that these luminous belts are sometimes seen in northern latitudes, and are sure signs of bad weather. I have written these few remarks in the hope that those of your readers who may have the chance of seeing an aurora borealis, will also look out for these clouds, and if possible determine their position.—C. E. STROMEYER, *Strawberry Hill, Jan. 4th.*

PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.*

BY W. JEROME HARRISON, F.G.S.

Society Excursions Utilised.—Everybody knows the routine of an ordinary excursion of a photographic society. Some well-known spot is selected, the further away the better, as North Wales, Dovedale, and Haddon Hall. If the day is fine, twenty or thirty members attend, and they go round the place in a crowd, occupying themselves to a large extent in getting in, and out of, one another's way.

I would suggest that the excursions be made local, and that a routine of work be drawn up beforehand, in which each detachment of three or four members should be assigned some particular task to accomplish. Thus, in a half-day excursion to Warwick, suppose twenty camera-carriers present themselves; let this number be divided into five sets of four members each, the tasks being as follows:—(1) The Castle and Grounds; (2) St. Mary's Church, including the Beauchamp Chapel; (3) the Leycester Hospital; (4) the Town of Warwick generally, its two gates and old buildings; (5) Guy's Cliff. Given a fine June afternoon, and the work of the survey for that town might be accomplished very rapidly on this plan. But it supposes that a full programme, showing the work of each section of the party, be drawn up beforehand and distributed.

Utilisation of Work already done.—There are probably in existence already some hundreds, or even thousands, of photographic negatives which would be of service in the history of Warwickshire. It must be part of our task to draw up a list of such negatives, showing their subjects and their owners. Some of them may, perhaps, be acquired by gift, loan, or purchase. A separate record book should be kept for those negatives which are already in existence; and a circular asking for information on this subject might be addressed to the professional photographers of the county.

Documents, &c., Copied by Photography.—We must photograph not only places, but things—old documents, seals, plans, maps, various objects of antiquity, rare fossils, &c. All these will provide food for the camera, and will add interesting pictures to our stock. One advantage of photography in this direction is that it enables us to *bring together*, for purposes of comparison, a series of objects which may be scattered in many collections. The facsimiles of documents obtained by photographic processes, are far more valuable than copies by hand can be, since they must be literal and unbiassed; errors in copying are avoided, and the evidence of the photograph is practically as good—sometimes, indeed, it is better, because clearer—than that of the original.

Size of Photographs to be taken.—I fear it will be impossible to bind ourselves down to any definite size of negative. Perhaps it would be best to make the whole-plate size (8½in. by 6½in.) our standard. By the recent substitution of celluloid films for glass plates, the weight of the photographer's equipment has been greatly diminished; so that a whole-plate camera with films weighs no more than a half-plate camera with glass plates.

By the use of cases or boxes to hold separately mounted prints, the difficulty of variety of sizes is largely avoided. If albums are made up, they could be of such a size as to hold one whole-plate print, or two half-plates, on each page.

* Concluded from page 31.

For hand-camera work the usual size is the quarter-plate (4¼in. by 3¼in.); and for pictures of this size separate albums might be provided, or they might be mounted four on a page of the larger albums. It must be remembered, however, that it is easy to enlarge or reduce negatives, so that they could all be brought to one uniform size if that were thought desirable. Or it is even easier to enlarge or reduce the prints as they are made from the negatives, if we use bromide paper for printing upon.

How other Societies (Literary, Artistic, and Scientific) can Aid in the Work of the County Photographic Survey.—I trust that it may be assumed that the three photographic societies already in existence in Warwickshire, viz., the Birmingham Photographic Society—Hon. Secs., Mr. J. H. Pickard, 361, Moseley Road, Birmingham, and Mr. A. J. Leeson, 20, Cannon Street, Birmingham: Leamington Amateur Photographic Society—Hon. Sec., Mr. F. M. Gowan, 20, Beauchamp Square, Leamington; Coventry and Midland Photographic Society—Hon. Sec., Mr. F. W. Dew, The City Studio, Coventry, will do all they can for the work of a photo. survey. But very valuable assistance can be rendered by several other societies within the county, whose aim is the furtherance of literature, science, and art. Among these I may name the Vesey Club, Sutton Coldfield—Hon. Sec., Mr. C. H. Marston; the Archæological Section of the Birmingham and Midland Institute—Secretary of the Section, Mr. Alfred Hayes; the Birmingham Natural History and Microscopical Society—Hon. Secs., Mr. W. H. Wilkinson and Mr. W. P. Marshall, M.I.C.E., The Mason College; the Birmingham Philosophical Society (1876)—Hon. Secs., Prof. J. H. Poynting, F.R.S., 11, St. Augustine's Road, Edgbaston, and Prof. Windle, Queen's College; the Birmingham and Midland Institute Scientific Society—Hon. Sec., Mr. W. E. Weaver, 221, Broad Street (this Society has a Photographic Section); Birmingham Microscopists' and Naturalists' Union (1880)—Hon. Secs., Messrs. Collins and White, Broad Street Corner; Birmingham Architectural Association (1873)—Hon. Sec., Mr. H. R. Lloyd, A.R.I.B.A., 26, Corporation Street; Birmingham School Natural History Society, King Edward's Grammar School; Birmingham Botanical and Horticultural Society, Botanical Gardens, Edgbaston—Curator, Mr. W. B. Latham; Warwickshire Field Club (1858)—President, the Rev. P. B. Brodie, M.A., F.G.S., Rowington Vicarage—Headquarters, The Museum, Warwick; Tamworth Natural History, Geological, and Antiquarian Society—Hon. Sec., ——; Royal (Birmingham) Society of Artists, New Street—Secretary, Mr. Jonathan Pratt; Kyrle Society—Hon. Sec., Miss Gittins, 87, Hagley Road; Association for the Preservation of Open Spaces and Public Footpaths—Hon. Sec., Mr. Grosvenor Lee, 18, Newhall Street; Art Circle—Hon. Sec., Mr. E. Chamberlain, Burlington Chambers, New Street; the Midland Arts Club—Hon. Sec., Mr. W. H. Vernon (meetings at Grand Hotel, Colmore Row): Municipal School of Art, Edmund Street—Head Master, Mr. E. R. Taylor—Secretary, Mr. E. Preston Hytch.

How Antiquarians, Scientists, and others, can Aid in the Work of a County Photographic Survey.—Now, although we photographers may know *how* to photograph, we do not always know *what* to photograph. We want the historian and the antiquary, the literary man, the artist, and the scientist, to aid us in this. We want these students of the past and the present to draw up lists of places and objects in each square of our map which they consider ought to be recorded; and we want them to tell us all about them, so that the pictures we secure may be of interest to us as well as to them.

Assistance from Landowners, Residents, and others.—The nature of our work ought to secure assistance from occupiers in all parts of the county. Armed with an introduction, stating the object and plan of this survey, the photographer may hope to be afforded facilities for his work which he would otherwise scarcely venture to ask for. Those who occupy historically interesting or beautifully situated places, will certainly be willing to aid in such a task, which may really be called national; while to the guardians of our churches—the clergy—our scheme should appeal with special interest.

Required Funds to be Obtained by Subscriptions and Grants.—In the work here proposed, it is thought that all the workers will be willing to help, not only by paying their own travelling expenses, purchase of dry plates on which to make negatives, use of apparatus, and so on, but also by subscribing to raise the funds which will be necessary for the purchase of maps, albums, cases, and the defraying of the cost of printing in platinotype, and making lantern slides.

It does not seem unreasonable, however, to ask for subscriptions from all who are interested in such a survey. Our own Society will, it may be hoped, make a grant in aid; and, doubtless, if a portion of the work is done as a sample, and well done, assistance will not be wanting.

The End of a Photographic Survey.—In the way of work to be done, there could be no end. Every day sees some change, something of the old order is blotted out, something new is introduced. A railway is made across our pet landscape, and we must photograph the trail of black smoke from the engine, if it be only to send the picture to Mr. Ruskin. How rapidly the features of our towns are changing must be obvious to the most careless observer, and anyone who has been absent from the new city for but a few years has good cause to sing the old song, "I can't find Birmingham!"

But the term "end" may also be considered in the sense of "object." What shall be done with our photographs when we get them? Well, this Society should retain at least two complete sets—a working set, and one for reference. Complete sets ought also to be prepared for our Municipal Reference Library, for the British Museum, and for any other public institutions who desire a set and are willing to pay for it.

Our schools would value highly a selection of large photographs, and enlargements might be made for this and other special objects—as for exhibition on the walls of our free libraries, for teaching and for lecturing and other purposes.

Further, it appears to me that the pursuance of a task such as I have attempted to sketch out would unite the members of this society as only men are united who have a definite object in view, and who work for a common end. It would attract, it may be hoped, new workers to join our ranks, and would add to the status of the Society in the eyes of the public. Much energy which is now frittered away would be diverted into a useful channel, and, although it may be said that the main benefits of our work will be reaped by a posterity "which has never done anything for us," yet I feel confident that we shall derive as much pleasure from *doing* the work, as our descendants will from its *study* and *examination*.

PHOTOGRAPHING THE BABY.

BY JOHN WIEDERSEN.

You want something practical for your magazine. That's just what all you editors write; you can supply the theoretical, and the amateurs, I suppose, the artistic. They have elevated photography, don't you know, to a very high standard of art, for which we professionals ought to be so thankful. Wish they had elevated the prices while they were about it. "More price, less art," is my business motto; I do good work, but don't call myself "artist;" no, I assure you. Well, you want something practical, you say, and nothing about art. I see you don't take down all the æsthetic fellows say about posing and composition, or perhaps your subscribers are crying out, "Hold, enough!" Well, I shall not give you anything artistic: I buy my back-grounds from the dealers, and don't build up any of the poetic groupings—genre pictures, as you call them. I am always consistent—that is, make my figures and my grounds congruous; that's a degree in art, I suppose. As I shall not or cannot give you anything artistic, will you have something artless?

I have considerable reputation as a photographer of babies from knee-high to a bumble-bee up; though it is giving away my trade I shall not be stingy, as I have learned many a good practical hint from your magazine which some other generous fellow has given to the public free, gratis, for nothing.

My method with the little ones (recollect I am not a father, and therefore have no fatherly feeling towards them) is as follows:—

The secret of success is in gaining their attention—to get their little minds away from self-consciousness. I remember that one of the writers in your journal gives this as the key for successful portraiture. His language is flowery, and I suppose he is an amateur, but for all that there is a good deal of common sense running all through his paper, but I did not get my idea from him; I have photographed babies, some of whom are now grandmothers. To divorce the mind from self-consciousness is the way to succeed with babies of all ages. Your writer tells how to secure this desideratum in the grown folks; I shall tell you how to secure it with babies.

Suppose we have one of those crying, wriggling youngsters, about two or three years old. You know how the minute they get in the chair the commotion begins; from sunshine to storm instantaneously. Have about you a number of noisical toys—not necessarily musical.

Begin at once to blow one of your penny trumpets. The result is a stare, an inquisition from the little soul whence came that sound, a desire to investigate; for all children not idiots are "newsy." Do not blow again on the trumpet, but ring immediately a bell. A new arrangement of the features takes place. Follow them up with a chuckle, then a run down of the scale on a mouth organ. It is the quick succession of events which engages the mind of the child, and by the time you expend your energies on four or five differently sounding instruments, you will be rewarded with a smile; then press the bulb and secure the impression. With larger children who are intractable I always have a lively conversation, sometimes a gentle dispute with them; telling them I don't believe they know what they are talking about. Doubt the story of Jack the Giant-Killer. Now anyone bold enough to say that the story of the redoubtable Jack is a fabrication will receive the gentle anathemas of the little ones for his scepticism. The result is a most animated expression. Sometimes the telling of a fairy tale in a way that conjures up expectation is just the best way.

It requires tact to get along with children. I sometimes try similar dodges on grown-up babies who are so dreadfully self-conscious that they mar everything in the way of good expression.

You don't tell them fairy tales, I hope! I think I hear you say. Oh, no; not exactly, but then I have a way of getting them out of themselves.

I first of all place on the upright, towards which I direct them to look, not a black mark that can be shoved up and down, but an interesting picture, full of incident, about which they are sure to ask you something concerning the topic. I begin work, the story progresses, and when I am ready I direct attention to a certain figure or object in the picture which has direct reference to what I am talking about. Of course interest is excited; the picture is at the right height on the pole for the eyes, and, moreover, the eyes, instead of being fixed staringly at one blank spot till they wink and water, can wander over a limited field without actually moving. This kink gives the means for securing the best expression possible. Some people tell me, of course, that I have taken them unfairly, and that the expression must be perfectly horrible. The proof is sent, and a good order follows; not only from themselves, but from their uncles, sisters, and aunts.

The use of the spot on which to fix the eyes is an invention of the Inquisition. It is a painful operation for a strong eye, and excruciating for tender eyes. In fact, I have known people to be almost put in a hypnotic state by gazing too long on a spot.

Now, as I wind up—or, as a photographer should say, cap my talk and put in the slide—I would like to know if you think this paper practical. If not, I shall add a string of formulæ, which neither I nor anybody else ever thought of trying, and I don't believe the men who send them to the magazine ever tried.—*American Journal of Photography.*

THE subject at the Camera Club for Thursday, Jan. 23rd, is "English Church Architecture as a subject for Photography," when a paper will be read by the Rev. T. Perkins, M.A.

PROPOSED LANTERN CLUB.—As will be seen from our Correspondence column, a project is on foot to establish an association of those interested in the work of photographic optical lanterns. We refer readers interested to the letter in question.

THE TOTAL ECLIPSE OF DECEMBER 22ND.—Misfortune has attended the double expedition sent by the Royal Astronomical Society to observe the total eclipse of December 22nd. In Africa observations were made impossible by bad weather. Observations were secured off the coast of French Guiana, but at a cost which is deeply to be deplored—the death of Father Perry. The telegram received from Demerara is as follows:—"101 corona American Perry dead dysentery." With regard to the part of this telegram which needs explanation, the *Times* of January 6th says:—"101 is resolvable into the factors 2, 4, and 13, of which the first number means that the weather was only moderately good; the second that successful exposures were made with the Abney 4-inch lens, but that the development was not carried out, owing either to unfavourable climatic conditions, or, possibly, to the illness of Father Perry; and the third, that successful photographs were obtained with the 20-inch mirror, but again the development was not completed. The words corona American signify most probably that the corona was of the same form as that seen on January 1st, 1889, when a total eclipse was successfully observed in California, and the form was then that now generally ascribed to a period of minimum sun-spots, elongated at the sun's equator, and radial but short at the poles."—*Nature.*

Notes.

Photographers who read the *Globe* of Saturday last must have rubbed their eyes when they saw a statement therein gravely intimating that photography must have been known in the thirteenth century. Mr. John Smyth, who is now ship's corporal on board H.M.S. *Impregnable*, was serving, to quote the *Globe*, exactly "$\frac{1}{4}$5 years" ago in the *Royal Adelaide*, and posted a letter containing a photograph to his mother. That letter reached its destination only a few days back. It appears it got into a crevice of the ship's letter box, where it has lain undiscovered "since 1274" (!) But this is not the only wonderful part of the story, for our contemporary adds: "On being opened the photograph was found to be in a good state of preservation." Clearly the discovery of this photograph, which must have been produced in the reign of Edward I., had a paralyzing effect on both the compositor and the writer. The "$\frac{1}{4}$5 years" of the first may thus be accounted for, and so also the astonishing information of the second, that the photograph was "opened," just as though it had been a mummy!

To enquire too curiously into this astonishing paragraph might be hazardous for our own brains and those of our readers, and to prevent any further catastrophe let us at once suggest that the figures may be misprints, the "$\frac{1}{4}$5" being probably intended for 15, and the "1274" for 1874. But taking this hypothesis as correct, the statement is yet sufficiently curious. Fifteen years' exposure of a photograph to the influence of sea air at times charged to excess with moisture, and the photograph still to be in "a good state of preservation," is a marvel indeed. We have always been under the impression that if anything was calculated to try the temper of a photograph, it was a sea voyage. This wonderfully tough specimen ought really to be tried by a jury of experts, and if found to justify the description of the *Globe*, to be hung up in some public place as a refutation of the popular impression that photographs are not enduring.

Photography has been the subject of a good many puns, but it is now squeezed perfectly dry. This is evident when so expert a master of word play as Mr. Burnand fails to extract a joke from it having the least scintillation of freshness. A photographer's studio and a photographer play an important part in the new burlesque "Tra la la Tosca," but, except to lead up to the droll mock execution when half a dozen photographers take aim with their cameras at the prisoner, it is not easy to find out the reason why photography is lampooned. Perhaps Mr. Burnand's faculty for parodying names may have had something to do with it. "Count Cameradossi" is a happy hit.

Who is the inventor of the latest instantaneous photographic apparatus, and of what does the latest apparatus consist? The question is rather an important one, because new instantaneous photographic cameras are being invented at the rate of at least one per week. Whoever the inventor in question may be, we are interested in reading that last week he had the honour of displaying his invention to the German Emperor and Empress at the New Palace, Potsdam. The society journal which chronicles this information says, "The inventor claims to be able to take photographs from life in a manner bordering on the incredible, and surpassing all expectations. As a proof of the power of the machine, the inventor took two portraits of their majesties, with which they were greatly pleased." Is it such a proof of "power" of an instantaneous camera that it is able to photograph Royalty?

A correspondent raises a nice point. He wishes to make some lantern slides from the pictures in *Punch*, but is troubled over the copyright question. Is he infringing the Act by copying them and exhibiting the slides on the screen, he would like to know? In the absence of any precedent, we should fancy there is nothing to prevent him copying the pictures, but he must not attempt to sell the slides. It is also a moot point whether the exhibition before an audience who have paid money to see the lantern entertainment might not constitute publication. Permission probably would be accorded by the proprietors of *Punch*. We know a case where an application was made by a professional maker of slides to the proprietor of another comic journal, and consent was obtained on condition that the words "by permission of the proprietor," and the name of the paper, were on each slide so as to be seen by the audience.

Dr. Vogel, in an article in the *Bulletin de l'Association Belge de Photographie* on the jubilee of photography, points out the influence which photography has had upon the art critic. He contends, and with perfect justice, that photography has given to the public a more profound knowledge of nature, which enables it not only to appreciate, but to judge of the works of painters much more accurately than was possible years ago. Painters, on the other hand, have been compelled to work according to the light which photography has thrown upon the conventionalties of art now shown to be errors. As for the power of reproduction, photography has worked quite a revolution, and added materially to the earnings of the artist. Dr. Vogel gives an example of a painter who sold his picture for 1,500 marks, the reproduction of which brought in at least ten times as much.

But in Germany the reproduction of pictures has grown into an industry of vast dimensions. In England not only artists, but buyers, have occasionally a curious prejudice against their pictures being reproduced by photography. How rarely does one see any of the hosts of pictures hung every year in the Academy, the Institute, and the other galleries reproduced by photography! Yet one would think it would be easy to create a market for photographic scraps of current art. If it were the custom for

painters to have their pictures photographed, the public would eagerly buy copies. But the latter must be sold cheaply to make the demand. It has been urged that if photographs of a picture were sold at a low rate the sale of engravings would be injured, but we fail to see any force in the argument, as the classes of buyers are totally different.

We are not quite sure whether it needs an Archbishop Whately to prove that half a dozen photographs identical in every respect are exactly the same, but we fancy it would puzzle even a logician of Whately's keenness to convince ordinary persons that any number of similar photographs are collectively one, and *vice versa*. This sounds like one of Mr. W. S. Gilbert's topsy-turvyisms, and we had better hasten to explain what we mean, which, fortunately, we are able to do from a case which recently came before the Surrey magistrates. A lady residing at Richmond had occasion to dismiss her servant summarily. After the goods and chattels had been packed up and sent away, it was discovered that a photograph belonging to the maid was missing. The bereft owner thereupon took the summary course of walking into her former mistress's house, and coolly removing a photograph similar to the one she had lost from a frame in the drawing-room, and carrying it away. For this she was charged with larceny, and the case was taken to the Quarter Sessions. There was no question as to the facts, nor was it disputed that the girl knew the photograph she took was not hers, yet the grand jury, directly they heard that the photographs were similar, threw out the bill

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There is something very droll in this, and either both the girl and the grand jury considered there was no difference between one and a dozen or more photographs from the same negative, or that anybody has a right to look upon a photograph as umbrellas are regarded—common property. Certainly, in the first case, a wide field for speculation is opened up as to any one photograph possessing any identity over another photograph from the same negative, and a very pretty casuistical discussion might be raised on the point by any photographic society hard up for a subject.

Mr. Muybridge gives the palm to Meissonnier for correct drawing of the horse. This is not to be wondered at, for a more conscientious worker does not exist than the great French artist. He pays large sums every year to his models, but he is most exacting. It is said that desiring to paint a horse in a rearing position, he had one forced to assume the attitude every morning until he was satisfied he had got the drawing correctly. The picture was a triumph, but the unfortunate horse was ruined through its enforced exertions. Rosa Bonheur, Mr. Muybridge considers to be the worst painter of animals, and ridicules the drawing in the "Horse Fair." It would be interesting to have his opinion of Mrs. Butler's "Roll Call," which at the time of its exhibition excited so much discussion in regard to the position of the horse's legs.

THE PACKAGE OF PHOTOGRAPHS FOR POST.

BY C. BRANGWIN BARNES.

WHEN a client lives at a distance beyond which it is possible to forward his or her portraits by messenger, it is usual to make use of either the book or parcels post as a means of transmission. Photographs so sent are, as a rule, received with dispatch and in good condition, although, unfortunately, there are exceptions to this rule, and, strange to say, these exceptions always take place with regard to the most important parcels. Having recently had occasion to complain to the postal authorities of damage to several packages of photographs during transit, I was informed that every possible care was taken of such parcels, but unless they were marked "fragile," no exceptional measures could be taken. Two or three of the packages in question consisted of, in some cases, six, and in others twelve cartes-de-visite, enclosed in cardboard postal wrapper, and marked on the outside "photographs only," yet these packages were not damaged in a slight degree, but broken right across the centre, every carte being completely spoiled. In other instances the prints have been so rubbed as to be worthless, and I am sorry to add that in a few cases, where twelve portraits have been forwarded, only eleven have been delivered. All parcels sent by book post are liable to be opened by the authorities in order to see that they contain no written matter of the nature of a letter, and although the package may have been securely and properly arranged before such opening, it is very rarely fastened up again in the same style; it is not to be supposed that the examiner understands the necessity of preventing photographs from rubbing against each other, and even if he does, he very rarely seems to take any steps with that end in view. It is usual for photographers to pack their clients' portraits face to face, which helps to prevent rubbing of the albumen surface; but after the examiner has done his work, he usually re-arranges all this. The only way out of the difficulty that presents itself to my mind is to send all carte and cabinet pictures by letter post, and all larger sizes by parcels. It may be urged that the difference in the rates of postage, between book and letter, would materially affect the petty cash account in the course of a year; but I should say any difference would be more than rectified by the additional satisfaction given to our clients, and by the fact that we should have less damaged prints to produce over again. If the margin of profit is too small to allow of the additional expenditure, then why not charge the postage to the sitter, as many firms do already? The portraits should then be packed in a perfectly fitting envelope, so as to allow no room for their rubbing together, face to face, with a slip of tissue paper between each pair, and a plain card at each side of the whole, as otherwise the outside pictures will bear a vivid impress of the sorter's zeal in the shape of a deeply indented postmark. A dozen cartes packed in this manner would cost three-halfpence or twopence for postage, as against one penny by book post.

The larger sizes should be first packed face to face and wrapped in thin paper, technically known as small hand, then placed between two pieces of thin wood (back boarding), one of which should be cut the reverse way of the grain to the other, and the whole packed in thick brown paper and securely tied. I recommend wood in preference to strawboard for two reasons: firstly, because it is cheaper; and secondly, because the contents are far less liable to damage. The reason for the wood being the two different

ways of the grain is not far to seek, as it increases the strength of the package at least four-fold. The address may be attached on a luggage label, which should also carry the stamps to defray postage.

Unmounted prints should be rolled, albumenized surface outwards, on a thin wooden roller, and enclosed in a strawboard music roll; so packed, they cannot be damaged, unless maliciously, and to prevent any intermeddling with the contents, letter post, or if the package is heavy, parcel post rates should be paid.

Negatives, opals, or opalines should be packed in a wooden box containing hay or bran—I personally prefer hay, as it keeps the contents more steadily in one position—and under no circumstances should the address be written or stamps stuck upon the box or its covering, the sudden jar of the stamping machine being often sufficient to break the negative inside, without damaging the box.

In conclusion, there is no necessity for marking the parcels as containing photographs, as the word seems to convey little or no meaning to the postal employés: in its place the word "fragile" should be substituted, it being of far greater necessity to impress upon the minds of those whom it may concern that the contents of the parcel are capable of receiving injury, than to inform them of the exact nature of those contents. While on the subject of packing, it may not perhaps be altogether out of place to mention the package of framed photographs, more especially as so many come to grief during transit. All photographs in frames should be first encased in a good covering of soft paper, and then again in thicker, and tied firmly between two boards; or, if the frame be a large one, it is sometimes advisable to pack it in a box. When such is the case, care should be taken to thoroughly fill up the interstices between the frame and the sides of the box with plenty of old waste paper, the softer the better, and, in the case of a very heavy frame, it will be found of advantage to put a couple of stout screws through the bottom of the box into the back of the frame itself, which will prevent it from moving and chipping.

PHOTOGRAPHING THE HANDS.—We owe a new and interesting application of photography to M. Bertillon, the well-known director of the Identification Department at the Paris Prefecture of Police. M. Bertillon has been devoting himself for some months to the study of the physical peculiarities engendered by the pursuit of different occupations. The police have frequently to deal with portions of bodies, and it would greatly aid their investigations to be able to determine the calling of the murdered person in each particular case. The hand is as a rule the part naturally most affected by the occupation, and M. Bertillon has taken a very large series of photographs, each one showing on a large scale the hands, on a smaller scale the whole figure of the workman at his work, so that one may see at a glance the position of the body, and which are the parts that undergo friction from the tools in use. From the hands of the navvy all the secondary lines disappear, and a peculiar callosity is developed where the spade handle rubs against the hand; the hands of tin-plate workers are covered with little crevasses produced by the acids employed; the hands of lace-makers are smooth, but they have blisters full of serum on the back and callosities on the front part of the shoulder, due to the friction of the straps of the loom; the thumb and the first joints of the index of metal-workers show very large blisters, whilst the left hand has scars made by the sharp fragments of metal. Experts in forensic medicine (Vernois among others) have before drawn attention to the subject, but this is the first time that an investigation has been carried out on a large scale, and in M. Bertillon's hands it should lead to the best results.—*Nature*.

VAPOUR DEVELOPMENT.

BY T. H. LUDERS.

THE use of vapours in picture making was one of the first methods. The polished silver plate being exposed to iodine vapour to make it sensitive, and after-exposure to that of mercury to develop the image, was the process of early days. Since then there does not seem to have been any use of vapour, except for fuming silvered albumen paper.

In the use of ammonia vapour, I have found by a few crude experiments that the modern dry plate may be developed by soaking for a minute or so in a plain solution of pyro in water, and then exposing to the fumes of ammonia, again returning it to the pyro bath, followed by the ammonia vapour, thus alternating until sufficient density is obtained. There does not seem to be much difference when the vapour is used before the bath—of course first wetting the plate—though more careful experiments may show an advantage. I find that a plain, strong pyro solution acts most rapidly, but too powerful a vapour acts too strongly, and is liable to produce red and green fog.

I think that a solution of pyro with any preservative that could be used with ammonia as the alkali, might also be used with ammonia vapour, and the alkali having kept separate from the pyro, it might be used repeatedly, as the action goes on mostly while under the influence of the vapour, and it seems to be necessary only to swab the plate with the pyro solution.

Perhaps the most valuable quality of this process is the ability it gives to localize and control development, as any part of a plate may be built up while other parts are left nearly or entirely undeveloped. By holding the plate film side down over an open bottle of ammonia, which may be warmed a little to increase the vapour, the image is slowly or rapidly developed, according to the distance above the mouth of the bottle. Four or five inches high diffuses the vapour sufficiently for uniform action over a five by seven plate, and for local action down to half-inch, according to the strength of the vapour. An open dish can be used, and probably a small hose from the mouth of the bottle would work for local development with film upwards. The above process is equally applicable to intensification with bichloride of mercury solution, and the action can be carefully watched, so that only those parts needing extra density need have full exposure to the fumes. It seems necessary that the plate should be evenly wet or damp all over to get uniform action, but I found no difficulty about that.

The advantages seem to be especially the local action without hard lines, and the pyro does not darken even in plain solution nearly so quickly as when the alkali is mixed with it, and probably by the use of a swab or brush, without immersing the plate in the solution, it could be preserved and used over and over again.—*American Journal of Photography*.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—An International Photographic Exhibition will be held in the Central Exchange Art Gallery, Newcastle-on-Tyne, from April 18th until May 3rd. A supplementary exhibition of photographic apparatus and appliances, and photo-mechanical printing processes, will be held at the same time and place, under the auspices of Messrs. Barkas and Son, Art Gallery, Newcastle-on-Tyne, to whom application for space in this section must be made. Further information may be had from the Hon. Secs. Photographic Exhibition, Art Gallery, Grainger Street, Newcastle-on-Tyne.

THE EXHIBITION OF THE WEST LONDON PHOTOGRAPHIC SOCIETY.

LAST Friday and Saturday the Exhibition of the West London Photographic Society was open at the Addison Hall, Addison Road, near Uxbridge Road railway station, and was of an interesting description. This Society of professionals and amateurs was founded in December, 1888, and principally by Messrs. G. F. Blackmore, T. B. March, L. Bennett, and J. A. Hodges. A preliminary meeting was held at Chiswick, and the subsequent meetings at Addison Hall. A new president is appointed for each year, and the retiring president is not eligible for re-election. The first president was Mr. William England, and the present president is Mr. Charles Bilton, B.A. The Society has about seventy members.

Last Saturday evening, Mr. Chang, of the Chinese Embassy, took four flash-light pictures of the assembled company. On the platform he had two small cameras, one on a stand, the other attached to the back of a chair by a camera clip. The top of a step ladder on the platform he covered with tufts of gun-cotton, and on this explosive area of nearly a foot square he distributed a considerable quantity of magnesium powder out of a bottle; the flash was necessarily of a magnificent description, and left behind some little residual bonfires of blazing magnesium.

THE JUDGES' REPORT.

We, the undersigned, beg to state that our awards in the 1890 Photographic Competition between members of the West London Photographic Society are as follows:—

Division I.—Class 1. Frame of six Dutch landscapes (first medal), W. L. Coolls; set of three, "Eventide," "Romney Lock," "Silver Lining" (second medal), G. F. Blackmore; set of three, "Conway Quay," "A Quiet Pool," "On the River Ogwen" (third medal), J. A. Hodges. This is a very well contested class, and we have had pleasure in awarding some of the medals withheld in the other classes. Amongst other pictures in this class, we would draw attention to "A Grey Morning, Dovedale," H. Selby; "Blowing up for Rain," J. Wilson; "A Coming Storm," C. Garner Richardson. Class 2. One photo of set of three, "Bridge and Stream," Walter L. Coolls, medal. Some discussion took place as to any award at all being given in this class. Class 3. Set of three, "Conway Castle," "Reception Room and Refectory," Plas Mawr (medal), J. A. Hodges. A very admirable series. Class 4. Exeter Cath. Choir (medal), Chas. Whiting. Class 5. Whilst withholding any award in this class, we would indicate that the "Sister and Brother," S. S. Chang, is considerably the best exhibit in the class. Class 6. No award. Class 7, 8, 9, 10. No award. Note.—In Class 8, "Greywell Tunnell" and "In Cassiobury Park," Dr. F. H. Low, show good technical work; "Kew Bridge," Dr. F. H. Low, being the best pictorially, though not held of sufficient merit. In Class 9, the only distinctive genre picture is "Spinning the Top," by J. A. Hodges; but it is rather a painting than a photograph. Of the rest, we would refer to "Watching the Amateur," by L. C. Bennett. *Lantern Slides.*—Class 12 (landscape), no award; the set marked "Bennett" is noted as the best. Class 13 (marine). Chas. Whiting, medal. Class 14 (architecture), Chas. Whiting, medal. Class 15 (instantaneous), withheld. Class 16. The judges prefer to leave this exhibit to a judge with the requisite technical attainments.

Signed, G. DAVISON, F. P. CEMBRANO, F. M. SKIPWORTH.

The annual *conversazione* of the Society was held at the Exhibition last Friday.

Mr. CHAS. BILTON congratulated the Society upon the Exhibition; he also congratulated those members who had been fortunate enough to gain medals, at the same time reminding those who had not been so successful that their failure on that occasion should stimulate them to greater efforts in the future. He then read the report of the judges, and informed the members that the names of the competitors were not disclosed to the judges until after the awards had been made.

The medals were then presented to the successful competitors by the president.

Dr. F. HARRISON LOW, in proposing a vote of thanks to the judges, remarked that curiously enough the awards upon the present occasion seemed to have met with universal approbation.

The motion having been seconded by Mr. Bennett, and adopted,

Mr. DAVISON, responding on behalf of the judges, said that although it was generally held that the task a judge had to perform was a thankless one, yet he was glad to find, from the manner in which the awards had been received, that such was not the case invariably. There was, however, a thought far back in the inner recesses of his own mind that there might be some dissatisfaction at the number of medals withheld. Although he did not then propose to justify the circumstance, he had not the slightest doubt but that the exhibitors would, on calm reflection, feel convinced that the action of the judges was justifiable. They went through their task with great care, going over some pictures again and again, and when a discussion arose as to whether a medal should be awarded or not, a decision was arrived at by a fair system of give and take. The Society was to be congratulated on the appearance of Class 1, landscape, half-plate, and under. Considering the size of the collection as a whole he did not think he had ever seen a better class. Although they had given two extra awards in that class, there were still three other exhibits well worthy of mention; they were photographs which would bear examination, and although, perhaps, defective in some respects compared with the winning pictures, yet still possessed considerable merit; not merely technical merit, but something approaching "the pictorial and complete." The architectural class, half-plate and under, was also an exceptionally good one on account of the excellence of some of the exhibits, among which he would refer specially to Conway Castle, Refectory and Reception Room, and Plas Mawr, a set of three platinotypes by Mr. Hodges charming in colour, well chosen and beautiful in subject, and technically of great perfection. Also in Class 1, he would specially refer to the three medalled pictures by Mr. Blackmore, which were of high artistic merit, and speaking for himself he would say he hoped to see much more work from Mr. Blackmore at future exhibitions.

The members and their friends then inspected the pictures and lantern slides exhibited. Light refreshments were provided by the president, and the tables were presided over by Mrs. Low and Mrs. Hodges. A musical programme, in which Messrs. M. Morgan, H. Selby, Syckelmore, and Pilgrim took part, contributed to the pleasure of the evening.

The next meeting takes place on Friday, 24th June, when an adjourned discussion on "Hand-Cameras" will be concluded. The competition slides will also be shown by means of the lantern.

A TENACIOUS SOLDER.—An account is given in the *Berliner* of a soft alloy which adheres so firmly to metallic, glass, and porcelain surfaces that it can be used as a solder, and which, in fact, is valuable when the articles to be soldered are of such nature that they cannot bear a very high degree of temperature, the composition consisting of finely pulverized copper dust, which is obtained by shaking a solution of sulphate of copper with granulated zinc. The temperature of the solution rises considerably, and the metallic copper is precipitated in the form of a brownish powder—twenty, thirty, or thirty-six parts of this copper dust, according to the hardness desired, being placed in a cast iron or porcelain-lined mortar, and well mixed with some sulphuric acid having a specific gravity of 1·85. To the paste thus formed are added seventy parts by weight of mercury, with constant stirring, and when thus thoroughly mixed, the amalgam is rinsed in warm water to remove the acid, and then set aside to cool; in ten or twelve hours it is hard enough to scratch tin. On being used, it is heated to a temperature of 375 degrees centigrade, and when kneaded in an iron mortar becomes as soft as wax. In this ductile state it can be spread upon any surface, to which, as it cools and hardens, it adheres with great tenacity.

Patent Intelligence.

Applications for Letters Patent.

239. W. S. ROGERS, 7, Addison Road, Bedford Park, London, "Cameras."—January 7th.

278. W. H. WALKER, 323, High Holborn, London, "Photographic Developing Trays."—January 7th.

292. G. E. KING, 57, The Grove, Hammersmith, "Illuminating Pictures."—January 7th.

304. FRANK BISHOP and A. COWAN, "Apparatus for Coating Photographic Plates."—January 7th.

317. T. N. ARMSTRONG, 154, St. Vincent Street, Glasgow, "Arrangements for Photographing by Artificial Light.—January 8th.

359. A. J. BOULT, 323, High Holborn, London, "Cameras."—January 8th.

384. A. FUHRMANN, New Bridge Street, Manchester, "Revolving Stereoscopic Panoramas." January 9th.

401. T. H. REDWOOD, 57, Chancery Lane, London, "Producing a Flash Light."—January 9th.

511. J. E. THORNTON and E. PICKARD, St. Mary's Street, Deansgate, Manchester, "Adapting Photographic Shutters to Lenses."—January 11th.

547. J. E. MAYALL, 1, Quality Court, Chancery Lane, London, "Colouring Photographic Impressions with Oil Colours."—January 11th.

Specifications Published.

494.—*January 10th*, 1889. "Photographic Apparatus." CHARLES WINTER, London, Manager to Messrs. Mawson and Swan, 33, Soho Square, London.

The principal object of this invention is to provide a photographic apparatus in which a number of plates or sensitized surfaces are placed in succession in position for receiving the photographic image, and are afterwards returned to a receptacle, in which they are retained without opening the camera or exposing the plates or surfaces to light otherwise than in taking the picture.

According to my invention, as applied to photographic purposes, I provide a suitable closed box or camera in which there is a lens provided with a shutter. Inside this camera, opposite the lens, is a rotary device, into which the sensitized plates or surfaces are introduced one after the other from a box, and from which rotary device they are liberated and received into another box after the picture has been taken thereon. This rotary device constitutes the "slide" of the camera, and is hereinafter referred to as the rotary slide.

The said rotary slide has one end of its axis projecting from the camera, and is provided with a milled head or other means for giving rotary movement to it. The box which contains the unexposed sensitized plates or surfaces, and the box into which the plates or surfaces are received after exposure, are situated inside the camera, preferably occupying the space above and below the lens.

The box from which the plates are supplied to the rotary slide is provided with means by which, when the rotary slide is operated, the undermost of the plates is moved from off a support and falls into a position before a slot in the box, through which the plate can fall or be moved into grooves or guides for receiving it in the rotary slide. These means may consist of a piece which is operated by a projection or recess on the rotary slide, which projection or recess, when movement is given to the slide, causes the said piece to move inwards a pusher bar or the like, which dislodges the undermost plate, and causes it to take up a position in which it can leave the box, and be received in the grooves or guides for it in the rotary slide. A rotary movement is then given to the slide, and thereby the sensitized side of the plate is presented in position to receive the photographic image, and when the shutter is opened the plate or sensitized surface receives the said image; and when, thereafter, the shutter is closed, the rotary slide has a further movement of rotation given to it, which brings the guides or grooves containing the plate into line with the box which is to receive the exposed plates. This preferably consists of a box with an opening in it to admit the plate, and provided with pushers, which are operated by the rotary slide, to press the plate into the box until it is received and retained under retainers, when the pushers return to thir normal position. It is preferred to make the rotary slide with two sets of grooves or guides, so that when one is in line with the box from which the unexposed plates are to be discharged, the other is in line with the box into which the exposed plates are to be received. The plates may be moved from and into the boxes respectively by being caused to fall by gravity, or there may be an endless band or carrier, or other device for the purpose, operated by the rotary slide. The shutter may be arranged to be set either by hand or by a movement derived from the rotary slide, the movement liberating the shutter for the exposure or uncovering of the lens being actuated by hand. Thus, in the arrangement wherein there are two receptacles for plates in the rotary slide, the said slide is brought into a position to receive a plate from the box containing the unexposed plates, and in this movement a plate is brought into position for passing from the box into the rotary slide as aforesaid. When the plate is received into the rotary slide, a quarter turn is given to the said slide, and the plate is then in position for exposure. After exposure a further quarter turn is given to the rotary slide, when the plate which has been exposed is brought into line with the box for receiving the exposed plates, the other guides in the slide then being in position for receiving a fresh unexposed plate, and so on. The axis of the rotary slide, or the head or handle by which it is operated, may be provided with a catch or spring bolt engaging with retainers, so that the slide is kept in proper position, the positions being suitably marked outside the camera, so that the position of the rotary slide can be readily ascertained. The portion of the said slide upon which the plates rest when in position for exposure are made movable, and are operated by a cam or other suitable device, so as to move free of the plate when it is to leave the rotary slide.

Although I have mentioned plates, the invention is of course not limited to the glass plates known as "plates" in photography, as other sensitized surfaces may be used.

504.—*January 10th*, 1889. "Apparatus for the Display of Illuminated Transparencies." CHARLES NORMAN MORRIS, of 36, Red Lion Street, Holborn, London, W.C., Designer and Draughtsman.

This invention has reference to an improved means for the display of illuminated transparencies, such, for instance, as theatrical notices, scenes from plays which are, at the time, being performed, trade notices, and the like, as also for recreational and other purposes.

The device or appliance, according to the invention, comprises an enclosing case of any suitable size and material to serve as a lantern, within which is arranged a gas burner, oil lamp, or other means of illumination, a suitable reflector being provided for the purpose of concentrating the light. In the roof of the lantern, immediately above the illuminating medium, is suspended a wheel formed of a number of vanes or wings disposed within a ring or hoop, which wheel is caused to rotate by an upward current of air set up by the heat of the illuminant. Upon two sides of the hoop above referred to are arranged segmental racks which engage with pinions formed upon two spindles carrying rollers for the purpose hereinafter to be described. During the rotation of the wheel above referred to, the spindles rotate therewith until the last tooth of the first segmental rack has passed beyond the pinion, when both pinions stop; the wheel, however, continues to rotate until the second segment becomes engaged with the pinion. During the interval when the first segment leaves the pinion, and the engagement therewith of the second pinion, the tendency of the revolving wheel would be to rotate with greater speed; this, however, is checked by a spring which comes into action at the proper moment, and, pressing upon the rotating wheel, regulates the speed thereof.

Upon the rollers, above referred to secured to the spindles, is mounted a web or band of paper or cloth, rendered transparent by any of the well-known methods, upon which is

printed, painted, or otherwise delineated, facsimiles of theatrical notices, scenes from plays or operas, trade announcements, posters, and the like ; or, if the improved apparatus is to be employed for recreational purposes, I may cause to be painted, lithographed, or otherwise produced upon said web or band, landscapes, seascapes, or other scenes of interest, such as illustrations of domestic, political, historic, and other episodes. In the representation of theatrical notices, I prefer to surround such notice with a border, illustrating some of the characters of the cast, as also scenes emblematic of the play ; or, if desired, said border may be simply ornamental, either mediæval, antique, modern, or in any other attractive style.

The web or band above mentioned being fixed to the rollers is, when the revolving wheel is in motion, rolled upon one roller and unrolled from the other, each scene dwelling a limited time determined by the distance between the two segmental racks upon the wheel aforesaid, and the speed at which the wheel revolves. Suitable guide-pulleys are employed to keep the web or band from sagging whilst the latter is moving.

When the winding of the web or band upon either of the rollers has been completed, the mechanism will cease to operate, but the current of air impinging against the wheel will cause the latter to move to the opposite side, where the segmental racks would engage with the pinion of the roller from which the web or band had been previously unrolled, setting it in motion and thus causing the web or band to be rewound upon the last-referred to roller. In the employment of lanterns for the display of large transparencies, wherein greater power would be required than in the case of small lanterns, is employed a hot air chamber, by means of which may be obtained any degree of pressure upon the wheel suited to the size and the special requirements of the lantern ; but the inventor does not confine himself to the automatic working of the mechanism by the pressure of a current of hot air, as under some circumstances, the same purpose can be effected by mechanical means or other source of power.

With a view to the protection of the transparency from injury from the heat of the illuminant, there may be interposed between a sheet of thick, clear glass, and in order to guard the web or band from becoming wet from rain when the appliance is employed in the open air, the whole is covered with a sheet of glass fitted into a suitable frame, ornamental or otherwise, as may be desired, the two sheets of glass forming a chamber between which the transparency is caused to move.

17,436.—*November 2nd*, 1889. "Discolouring Tannic Acid Solutions." HERBERT JOHN HADDAN, of the firm of Herbert and Co., Patent Agents, of 18, Buckingham Street, Strand, London, Civil Engineer. A communication from JULES LANDINI, of Grimm No. 6, Hamburg, in the empire of Germany, Manufacturer.

The object of this invention is to discolour solutions derived from wood, plants, and leaves used in tanneries, in order to be able to obtain transparent and clear liquids. The principal part of the invention consists in treating such solutions with nitrate of lead, and subsequently with the addition of alum and borax. The solutions, according to their respective strength, are mixed with suitable quantities of nitrate of lead, then heated or boiled until a complete discolouring has taken place. During this process samples are withdrawn from time to time, and the addition of nitrate of lead is increased until the discolouring is completed.

As an example of the practice of this process it may be mentioned that new decoctions of tannic acids are treated with about 2 kilogrammes of nitrate of lead for each thousand litres of liquid.

It is convenient to use a diffusion battery during treatment of the tannic acids into which the solution is introduced ; then make the above-named addition of nitrate of lead, and boil the mixture for some 25 minutes ; then decant the solution into a vessel or drum provided with some stirring device into which steam is admitted of about $\frac{1}{2}$ atmospheric pressure. After stirring for about 20 minutes a sample is withdrawn and a further supply of nitrate of lead is added should this be found necessary, and the stirring continued until the desired degree is attained. The solution is now withdrawn, cooled down, neutralized, and filtered.

17,708. *November 6th*, 1889. "Photographic Cameras." THOMAS RUDOLPH DALLMEYER, of 25, Newman Street, Oxford Street, London, Optician, and FRANCIS BEAUCHAMP, of Hope Cottage, Whalebone Lane, Chadwell, Romford, Essex, Engineer.

The inventors claim :—

1. A photographic camera, the extensible portion of which is built up upon a wire support.

2. The extensible portion of a camera built up upon a continuous wire support.

3. The support formed of a series of sections or frames.

4. The improvements relating to the manufacture of the extensible portions of cameras described and illustrated.

Correspondence.

REPRODUCTION AND COPYRIGHT.

SIR,—Mr. Ralph W. Robinson's letter has elicited replies which seem to establish two new facts hitherto, I fancy, unsuspected by the majority of photographers, yet of great value to them.

In the first place, your "Notes" show, what few seem to have known, that the right to reproduce a photograph by way of engraving for the use of illustrated papers is worth a certain sum of money, and that one firm, at least, demands and obtains ten shillings for the right to reproduce a portrait in *one* paper, and that they demand a further fee if other use is to be made of the block. Hitherto, the newspapers have patronisingly and doubtfully repaid the photographer by mentioning his name. This concession had to be forced from the papers.

The other fact is of still greater importance. It has been the opinion of the photographic authorities from the beginning, and stated nearly every week in answers to correspondents in one or other of the photographic journals, that if a print of a photograph was sold before it was registered, the copyright was lost. Nobody seems to have doubted the verdict until Mr. Robinson asked the question, which has drawn an authoritative legal reply from Mr. C. Fleetwood Pritchard, who, I believe, is not only a barrister, but also an excellent amateur photographer. He shows us that our trusted leaders have misled us for once, and that a photograph can be effectually registered at any time, with the drawback, however, that the registration is not retrospective, and cannot protect from piracies that have preceded the act of registration.

The photographic world is a gainer for this addition to our stock of knowledge, and it is to be hoped that now photographers know there is a money value in the right to reproduce, they will insist upon getting it, always remembering that they can protect their property *for the future* by registering at any time.

A. D. L.

SIR,—In my letter under the above heading I perhaps dwelt too exclusively on the case of photographs "which are intended to be pictures," as it is from that point of view the subject of right to reproduce has chiefly affected me. However, in the case of a great many, probably the majority of portraits used for reproduction in newspapers, the principle is the same.

You say that the cases you have in your mind are those in which the photographer has already been paid for making the negative. In that case the photographer has no copyright, and therefore no right himself to reproduce, or to give permission to others to do so. The necessary permission in this case, as I understand it, can only be obtained from the sitter. In the majority of cases the sitter has been invited to sit, and the portrait has been produced simply for publication purposes, and in this case it is only reasonable that the photographer should exact a fee from anyone who wishes to use the portrait for reproduction.

The principle is the same as charging two shillings or so for

a published cabinet portrait. It surely would not be contended that it would be for the good of the profession in the long run to publish cabinets at threepence each; yet a photographer cannot have any better advertisement than the spreading abroad of good work bearing his name. It appears to me that any of those means of advertising which tend to cheapen photography in the eyes of the public are detrimental to the best interests of the profession. RALPH W. ROBINSON.

FORMATION OF A LANTERN CLUB.

SIR,—Will you permit me to call the attention of your readers to a step which I trust now to see taken, viz., to bring together, either by means of a club or association, in a practical form, those who are interested in the work of photographic optical lanterns.

I will not here detail the advantages that may possibly accrue from such an association, except to suggest, (*a*) the development and improvement of the lantern itself, (*b*) to help in popularizing it generally, (*c*) to enable those who are fond of so delightful and scientific an amusement to become known to each other, and thus develop their common pursuit, (*d*) to hold in London and the country periodical exhibitions, (*e*) to facilitate the interchange of photographic slides, and (*f*) generally to promote lantern work.

The basis of such an association and its rules remain to be formulated. Meanwhile, I wish to put plainly through your columns a very pointed but respectful request, viz., will all those who are favourable to the idea forward to me at 46, Chesilton Road, Munster Park, S.W., or to the Hon. Slingsby Bethel, at Chelsea Lodge, Chelsea Embankment, their names and addresses, in order that they may be invited to a meeting, or informed of any proceedings that may be taken.

46, *Chesilton Road, Fulham, S.W.* T. H. HOLDING.

ISOCHROMATIC PHOTOGRAPHY AT THE PHOTOGRAPHIC SOCIETY OF FRANCE.

SIR,—Will you kindly allow us space for a few words in protest against M. Leon Vidal's unjust criticism of the prints from negatives on isochromatic and ordinary plates, which, by invitation of the president, M. Davanne, we recently presented to the French Photographic Society.

M. Vidal says in his report, which appears in the last number of the NEWS, that the photographs were "defective as examples," those on the ordinary plates being "taken in a bad light," while those on the isochromatic plates "were more directly lighted." As a matter of fact, both negatives in every case were taken under precisely the same conditions, as could easily be seen by the most cursory examination of those parts where the object was of a neutral tint, and which, not being affected by colour-sensitiveness, were rendered of equal value in both negatives.

We can quite understand that anyone not conversant with the subject would, at first sight, imagine that the great difference shown in some of the proofs could not be produced by colour-sensitiveness alone; but surely M. Vidal should know better. His insinuation that the negatives were dodged in the lighting does not do him credit, and would seem to show that he is ignorant of the progress which has been made in isochromatic photography.

We shall only be too pleased to afford M Vidal the means of testing the matter to his own satisfaction, should he desire further investigation. We are sending to the President of the French Society conclusive evidence that the specimens shown by us were not unfairly manipulated in any way, and we trust that M. Vidal will avail himself of the opportunity of making us the *amende honorable*.

It is unfortunate that as soon as any real improvement in photography is introduced, there are always to be found individuals who, failing to understand the matter by their own light and knowledge, are ready at once to say, "It is not true." These same persons a little later, or, as in this instance, almost in the same breath, rarely fail to raise the cry, "It is not new, we knew it all along."

We opine that M. Vidal will find few to agree with him that a process which has been worked out with infinite pains and at great cost by an individual should belong to the community as soon as it is found to be useful. If this principle were carried out, it would constitute the greatest barrier to progress which it is possible to conceive. It is precisely to prevent such a result, and to encourage research, that the patent laws have been adopted in all civilised countries. In the present instance it is extremely probable, except for the wisdom of the legislature in recognizing and protecting the commercial rights of inventors, which M. Vidal so coolly ignores, that isochromatic or colour-sensitive photography would now be numbered among the lost or forgotten processes of the art.

At the expiration of the existing patent, the process will be free to all the world; until that time arrives we are prepared to defend our rights in this country by all legal means, and at any cost. B. J. EDWARDS & Co.

The Grove, Hackney, London, January 13th.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the meeting of this Society, held on the 14th inst., the President, Mr. JAMES GLAISHER, F.R.S., occupied the chair.

A paper was read by Mr. Chapman Jones, F.I.C., F.C.S., "On Control in the Density of Negatives," in the course of which the author stated that in consideration of the difficulty of exactly deciding upon the density of a negative whilst developing, he considered it best to keep the intensity rather below than above what was finally required, and complete that part of the work in a good light after fixation. Then, as to the process to be used for giving intensity, it was better to take for the normal process one that increased the deposit in proportion to the silver already forming the image. There were processes that did not do this, and for special cases they might be preferable; but, starting with the normal requirements, he had found it most satisfactorily fulfilled by the method of using solution of bichloride of mercury, followed by one of ferrous oxalate. The solutions he used were:—First, a saturated solution of bichloride of mercury to which hydrochloric acid was added in the proportion of three minims to every two ounces of solution. After bleaching with this solution, the negative must be thoroughly washed—an operation for which an hour to an hour and a half with frequent changes of water was not too long. It was then treated with a ferrous oxalate developer composed of one part of saturated solution of sulphate of iron mixed with six parts of saturated solution of oxalate of potash. This developer was made slightly acid with oxalic acid—if considerably acid it was much slower in its action. A process that had been much recommended—that with mercury, followed by solution of sulphite of soda—he could not advise, except when only a very limited amount of intensity was required. It might, however, be used as a starting point, and the negative would be found to be in as good a condition for taking other methods afterwards as if it had not been used. The actual constitution of the image after the use of sulphite had, he believed, not hitherto been shown. He had found that the silver and mercury were both of them dissolved to the extent of one-half by the sulphite, but yet the resulting image was one which generally gave more density than at first. A claim that had been made for this method, that a plate might be treated repeatedly with the solutions, gaining intensity each time, was one that his experiments did not support. The process with mercury and oxalate he could recommend as being clean, having no tendency to frill, even with repeated operations; having freedom from choking up of the shadows, and preserving the gradation of the lights.

Mr. W. E. DEBENHAM considered it very useful to have the *rationale* of a process worked out, as had been done by Mr. Chapman Jones, with the mercury and sulphite process. He had never used that process, except experimentally, as the intensifying power was so limited, and there were others that he considered better. It had been stated that the sulphite pro-

ess might be used to start with, and, if found insufficient, other processes might be employed without the previous use of the sulphite being in any way injurious. As, however, it had been shown that half the original silver had been dissolved away in the sulphite, he put it as a question whether that did not leave the plate in a more unfavourable condition as a basis for intensifying on, than if the whole of the silver were present.

Capt. ABNEY confirmed what Mr. Debenham had said as to the inutility of the sulphite method of intensifying. Very foolish things had been written about intensifying processes, this with sulphite amongst others; and he thanked Mr. Chapman Jones for working out the *rationale* of it. His own predilection was for the cyanide of silver intensifying process, next to which he liked the one with mercury, followed by ferrous oxalate, as recommended in the paper.

Mr. ATKINSON asked Captain Abney whether he thought as perfect gradation was obtainable with the cyanide of silver process as with the ferrous oxalate following the mercury.

Capt. ABNEY replied that it was, and continued, that there was a great convenience in the process, in the facility with which too great intensity could be let down just to the desired point.

Mr. CHAPMAN JONES replied that what he meant by saying that there was no harm in beginning with the sulphite process, was that the image left was just as amenable to intensifying by other processes as the original plate had been. Half the silver was gone, certainly, but the mercury which had replaced it was in the condition to form a basis for intensifying by any known method.

Sir DAVID SALOMONS then read a paper on "The distance beyond which all objects will be in focus with any given lens." He had constructed a table, taking as a basis that any object was in focus when the circle of confusion did not exceed the $\frac{1}{150}$ of an inch. French photographers had adopted a different standard, and took about the $\frac{1}{250}$ of an inch as the standard of definition; but, he said, we cannot have detective cameras if the French measure is adopted.

Mr. DEBENHAM was afraid that the paper might tend to perpetuate a fallacy about lenses which some photographers appeared to entertain. He had even read in the photographic papers about the advantage of a lens with a fixed focus—an absurdity, as no lens could possibly have a fixed focus. The assumption on which the paper was based, that a lens was in focus when there was a circle of confusion of $\frac{1}{100}$ of an inch, was an assumption and not a fact. Taking the example worked out in the paper of a lens of 10-inch focus, it came out that an object which, to be in true focus, required racking in the instrument the $\frac{1}{4}$ of an inch, was still in focus without that adjustment—a proposition which he thought most practical photographers would recognize as not being true, even with the diaphragm of *f* 12 mentioned. As to the statement that if the French measure of permissible confusion was adopted, detective cameras could not be used, that would depend upon the question of the length of focus of the lens. A lens, say, of 3 or 4 inches focus might, while keeping to the French standard, work as rapidly and with as little proportionate confusion for equi-distant objects as the one of 10-inch focus supposed by the paper when giving confusion to the $\frac{1}{100}$ of an inch. Curvature of field such as generally, if not always, existed in detective lenses, was another element in connection with the amount of loss of definition in objects at varying and at equal distances—a loss of definition which might considerably exceed that due to the difference of distance referred to in the paper.

Mr. T. R. DALLMEYER said that the calculation made by Sir David Salomons formed a continuation of those made by his late father, and upon the same basis. If the $\frac{1}{100}$th of an inch was considered too much confusion to be tolerated, calculations might be made adapted to the French or any other standard.

A paper from Mr. W. K. Burton upon "Eikonogen as a Developer in Practice" was read in summary by Mr. Chapman Jones. The writer said that he had found the keeping quality of a plain eikonogen solution to be less than that of a plain pyro solution, but when mixed with sulphite of soda and an alkali the case was reversed. He found that an image developed with eikonogen came up more slowly than when pyro was used, but that eventually more detail was obtainable, probably 25 to 30 per cent., and that might be considered as so much gain in the exposure.

Mr. WARNERKE thought to get the best results, eikonogen and pyro must be treated differently. He found that he got the best effect with caustic alkali when using eikonogen, and that then it was better than pyro. He used:—

Water	100 parts
Sulphite of soda	10 ,,
Eikonogen	20 ,,
Caustic potash	20 ,,

He made up the solution with boiling water, not merely for ease in dissolving, but because the air was thereby removed. This strong solution he diluted with from three to ten parts of water, the former proportion when great vigour was required, and the latter for softer pictures.

Mr. WOLLASTON had not succeeded in getting such intensity with eikonogen as was wanted when copying line work, and enquired whether Mr. Warnerke had not found this to be the case.

Mr. WARNERKE had found the contrary.

Mr. LAWRENCE remarked upon the great strength of Mr. Warnerke's solution, and said that when he had made a solution of only sixteen grains to the ounce, some of the eikonogen had afterwards crystallised out.

Mr. DEBENHAM said that it was understood that eikonogen dissolved much more freely in alkaline solution, and that Mr. Warnerke's formula fulfilled this condition.

It was mentioned that nominations for the approaching election of members of council must be sent in by the 21st inst. The auditors for the year were appointed—Messrs. Seamell and Samuel; and scrutineers of voting papers, Messrs. Seamell, Freshwater, Chas. Sawyer, and Atkinson.

Messrs. H. G. Sheppard, E. E. Corke, and Rajmongee Chuer were elected members of the Society.

CAMERA CLUB.

January 9th.—Bedford Street, Strand, London; Sir GEORGE PRESCOTT, Bart., in the chair.

Mr. W. H. WALKER, who attended to read a paper about the new rollable celluloid film, said that his memoir was something like Artemus Ward's lecture on "Nineveh," which contained nothing about Nineveh in it. He then went into the history of film photography and roller slides, and when speaking of stripping films, said that 25,000 negatives per week were developed and stripped for those who had exposed them, by the Eastman Company, and that ninety per cent. of these were fairly good, if not superior, printing negatives. Those who failed with the stripping-films were persons who did not adhere closely to the instructions issued by the Company, or who, in some cases, used inferior materials, such as bad india-rubber solution. Sheets cut from the new rollable film are not recommended, since no known device will hold them perfectly flat in the focal plane; they should be used in a proper roller slide. The film will not endure great tension in the direction of its length, and when old Eastman roller slides give too great tension for use with them, that tension can readily be reduced by the possessor of the slide by simple means which the speaker described. The film should not curl in the developing solution, but to keep it quite flat, the Eastman Company had devised a new developing dish. The quantity of liquid required to develop a negative was then surprisingly small; still, he doubted whether those dishes would be necessary. To dry the negative, it should be pinned to a board by one or more corners; should it curl, it should, when dry, be wound in the opposite direction round a cylinder. He did not recommend the use of glycerine in this country to reduce curling, but in the dry atmosphere of some parts of the United States, where the furniture can be heard snapping and cracking like pistol shots, the conditions are different. The films are not yet upon the market in this country, but the Company is pushing forward its English factories with all speed. The speaker then exhibited specimens of the new film, coated and uncoated, also some film

negatives; he likewise exhibited various forms of old and new roller slides. He then stated that the new film had some peculiarities which, so far as he knew, were not understood. It sometimes presented markings like branches springing from a central point, and they seemed to be due to some electrical condition; such markings were rare. Also, users would occasionally find what appeared to be a lap or joint of two lengths of the film; it was not really a lap, but was due to the method of manufacture, and Mr. Eastman believed that this drawback would be corrected in the near future.

Mr. FRANCIS COBB wished that Mr. Walker had exhibited in its roller slide a film upon which 10 by 8 inch negatives could be taken; he had never seen a film of that size which, between the rollers, would keep perfectly flat in the focal plane.

Dr. LINDSAY JOHNSON had experienced the want of some very perfect transparent celluloid to mitigate the affliction known as conical cornea, a defect which prevents the sufferer from seeing anything clearly. A properly shaped piece of transparent celluloid laid upon the eye with a drop of oil between was of considerable advantage in such cases, and helped to throw a sharper image on the retina. With an English and French chemist he had been working at the improvement of celluloid, and had succeeded in producing specimens more perfect than that composing the films before them.

Mr. D. P. RODGERS had been taking photographs upon the new film, and found it fairly strong. Out of eleven negatives, he had found the branch-like markings in three. He was not a shareholder in the Company, but he thought that they all ought to be very grateful for what the Eastman Co. had done, and he would prefer to have three faulty negatives out of twelve, rather than to undertake the manipulation of stripping-films.

Mr. E. R. SHIPTON had found that the film, when of whole-plate size, did not lie quite flat in the slide; but the general results were very favourable as compared with the use of glass plates. Could not the Company mark where the laps would come? He also was not a shareholder in the Eastman Company, but was very grateful for what it had done.

Mr. H. STURMEY had been experimenting with a 10 by 8 roll, and had found no unevenness; his difficulty was to wind the film straightly off.

A member remarked that if the films were left to dry for twelve hours—that is to say, until they were far beyond the stage of being apparently dry—they did not curl. He thought that the branch-like markings did not seem to appear when the films were exposed upon wet days.

Dr. C. S. PATTERSON wished to know whether the films would preserve their flexibility when kept for a long time upon the rolls.

Mr. LYONEL CLARK said that the branch-like markings differ in appearance from what might be expected in stress-marks, and that they are distinctly in the film itself, and not in the celluloid. He thought that they were produced absolutely by an electrical discharge. When a celluloid comb is drawn rapidly through the hair, in dry weather, electrical sparks are sometimes produced. The electricity is not present at the outset either in the hair or in the comb, but is the result of friction; in fact, the mechanical energy put forth by the muscles is transformed into electrical energy. To avoid the production of electricity it is well, therefore, to exercise as little mechanical energy as possible, so before exposing the last half of the length of celluloid in his roller slide, he took care to unwind that portion with the greatest slowness; the result was, that the last negatives taken on his length of celluloid were almost entirely free from the branch-like markings. He thought that many photographers would like to expose the new film in double dark slides as usual, rather than to use a roller slide.

Mr. A. PRINGLE condemned the use of glycerine when developing negatives in this climate. Mr. Clark had the advantage of him in being able to perform the comb experiment. He thought that photographers did not want miniature thunderstorms inside their roll-holders.

Mr. S. BOURNE thought that the markings might be due to a kind of fungus in the film.

Mr. WALKER, in the course of his reply, said that Mr. Eastman did not at present intend to put larger films than 12 by 10 inches upon the rollers; he (Mr. Walker) did not know wherefore. Mr. Eastman and those working with him believed that they had so far surmounted all difficulties as to have reached a point where they see that they will be able to turn out a perfect film. Personally, he (Mr. Walker) had had nothing to do with the invention of the film; it was the outcome of the investigations of Mr. Eastman and Mr. Reisenbach. He believed that the films were permanently flexible, for otherwise Mr. Eastman—who had been working at them for a year—would not have put them on the market. He thought the branch-like markings to be electrical, and that they could be avoided by some changes in the mode of manufacture. He believed these films to mark the dawn of a new era in photography, the end whereof no man could see.

The CHAIRMAN thought that the invention would be of the greatest possible use to photographers in the future.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 2nd instant Mr. W. E. DEBENHAM occupied the chair.

Mr. A. COWAN showed a mixture of powdered eikonogen and sulphite of soda that had turned quite black in colour. The powder contained the following proportions: eikonogen 10 grains, sulphite of soda 40 grains. After mixing, the powder was put dry into a stoppered bottle. The next day it had turned quite black. Mr. Cowan said this tended to confirm the opinion of many photographers who questioned the preservative nature of the sulphite. On another occasion a mixture of eikonogen, sulphite, and an alkali and sugar in powder the next day turned to a pasty mass.

Mr. A. HADDON criticised the opinions expressed at the last meeting as to the cause of the cloudiness on the inside of the cover glass of a transparency, more especially the statement that it was due to the mercury left in film from toning attacking the lead in the glass. He said if such were the case it was a fact unknown to chemists and physicists. In his own experience he had never seen any erosion produced from mercury when in contact with glass. Mercury was in constant contact with the glass tubes of thermometers and barometers, and as far as he knew no case was known of its having caused any erosion of the glass. In his opinion the injury to the slide was caused by heat acting upon aqueous vapour imprisoned between the two glasses. He was cognisant of three instances where heat had caused a frostiness similar to that produced on the slide in question. In one case it appeared in a retort after heating over a spirit lamp (retort shown); in another a similar effect was produced in placing a chimney glass over a burner; and in the third instance a bottle, after washing, was placed in an oven to dry. The inner surface of the bottle became curled and wrinkled. He believed the cover glass referred to contained no lead at all. Glass makers would not employ expensive ingredients in cheap sheet or bottle glass. Mr. Haddon then read an extract from Watts Dictionary in support of his statements, and, as a farther proof, he held the neck of the retort already referred to over a spirit lamp, which at once caused a frosted appearance.

Mr. P. EVERETT asked how Mr. Haddon accounted for the cleanness of the cover-glass of the transparency in contact with the mask. Why was not the inside attacked equally all over?

Mr. HADDON said in all probability the paper mask had, by absorbing the aqueous vapour, prevented the heat to which the slide had been subjected in India having the same effect upon the glass.

A Member asked why the outside of the cover-glass had not equally been affected by heat and moisture.

Mr. HADDON said these conditions did not apply equally to the inside and outside of the slide. Heat and moisture were never going on simultaneously on the outside of the glass.

The HON. SEC. believed the binding of a great many slides was done before they ware thoroughly dry. In his own practice, he almost baked his slides before binding.

Mr. T. E. FRESHWATER had seen many field-glasses returned from India with the large lens attached inside, but not on the outside.

Mr. J. B. B WELLINGTON showed two sets of transparencies, the exposure of the plates in each set being 20, 40, 60, and 80 seconds respectively. In one case the plates were taken out of the dish immediately the development was complete, showing a range of tone from a warm colour to a black. The other set was left in the developer until the last one was developed; these developed all one colour.

The CHAIRMAN said this guide proved his contention, that a warm colour was due to an early stage of development.

Mr. WELLINGTON also exhibited a cover-glass of a slide that had been in contact for some time. It showed, when breathed upon, the opening of the mask very clearly. No amount of rubbing or polishing seemed to alter this condition of the glass

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At the meeting on the 9th inst. Mr. L. MEDLAND occupied the chair.

Mr. CONRAD BECK showed two lenses—one having brass mounts, the other aluminium; the latter being about half the weight of the brass-mounted lens. Mr. Beck said originally aluminium was expensive, but was now much reduced in price. Mr. Beck also exhibited a camera for general out-door work. Two advantages were claimed for this camera—very great rigidity, and simplicity in setting up, two motions only being necessary for this purpose. The front of the camera is fixed, the focussing being accomplished by a rack-and-pinion adjustment to the back.

The CHAIRMAN showed a negative having a curious geometric marking over the whole of the surface of the film. The plate after development was bleached with bichloride of mercury and intensified with ammonia, when the markings appeared. The plate had been thoroughly washed several times without producing any effect upon the markings.

Mr. T. E. FRESHWATER, referring to the discussions at the two previous meetings on the erosion of the inner surface of cover glasses of transparencies, had separated the glasses of some slides of the Paris Exhibition, 1878. They had only been through the lantern once, and had been shut up in a box for ten years. A clouding of the inside of the cover glass had taken place. This, however, unlike those exhibited at a previous meeting, yielded readily to rubbing with the finger. A coloured French slide, twenty-five years old, when separated, showed a distinct outline of the picture on the inner surface of the cover glass. Mr. Freshwater said in his experience French glass was much more susceptible of discolouration than English. He also passed round three prints taken by Mr. England's flash-light lamp.

Mr. A. COWAN showed a series of transparencies developed with a formula given in the current issue of the *Photographic Review*, copied from the *American Journal of Photography*:—

Water distilled	1 fluid ounce
Tartrate of sodium and potassium ...	25 grains
Sulphite of sodium	25 ,,
Carbonate of lithium	1 grain
Pyrogallol	2 grains

He had found it the most powerful developer in his experience. The solution remained perfectly colourless after several plates had been developed.

This being a lantern night, the remainder of the evening was devoted to the exhibition of members' slides; Messrs. H. D. Atkinson, F. C. Kellon, L. Medland, and T. E. Freshwater, each contributed a series of transparencies.

HACKNEY PHOTOGRAPHIC SOCIETY.

A MEETING was held on Thursday last, with Dr. GERARD SMITH in the chair.

Mr. FRED. H. EVANS read his promised paper on "Photo-Micrography" before the members on Thursday last; after which, over one hundred slides illustrative of the paper were shown through the lantern, the most interesting being a series of subjects taken with dark ground illumination, foraminifera, polycistina, wood sections, whole insects, corallines, and ectinus spine sections. The physiological slides were also regarded by medical members present as of special value. The usual specimens of insects and parts of insects were clear and sharp. A formula for development of which the lecturer spoke highly was a modification of one given by Mr. J. B. B. Wellington, and consisted of:—

A.—Quinol	462	grains
Meth. spirit	3½	ounces
Sulphurous acid	3½	,,
Brom. potass.	84	grains
Water to make	10½	ounces
B.—Sodium hydrate fused	261	grains
Potash ,, ,, ...	261	,,
Sodium sulphite pure	462	,,
Water to make	10½	ounces

30 minims of each to 8½ drachms of water.

Messrs. S. H. Barton and J. Reed were nominated members.

The SECRETARY announced that the album, first year's working, was ready for inspection, and that on the 23rd, Mr. F. W. Hart had promised to give a flash-light demonstration.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A MEETING was held on the 9th inst., at the Club Rooms, Grand Hotel, Birmingham, Mr. E. H. JAQUES in the chair.

It was announced that the council had given an order for the Society lantern, which is not to exceed thirty guineas; also that the annual exhibition would be open to the public on the 21st and 22nd inst., at the Temperance Hall, Temple Street, Birmingham.

Mr. C. J. FOWLER than gave his paper on "Notes on the Summer Excursions," illustrated by a large number of lantern slides made from the negatives taken by the lecturer and members.

Mr. W. J. HARRISON exhibited some slides made on the new celluloid film.

BATH PHOTOGRAPHIC SOCIETY.

January 8th.—Mr. W. PUMPHREY, president, in the chair.

Mr. Archibald C. Coke was elected a member of the Society.

The HON. SECRETARY drew attention to a parcel of photographic journals and books presented to the Society. Circulars relating to the forthcoming Exhibition at the Crystal Palace were also laid on the table.

The CHAIRMAN welcomed Mr. Sumner Gates, of the Cambridge (U.S.) Camera Club.

Mr. GATES, after thanking the Society for the kind way in which they had received him, spoke on the subject of flash-light photography. He had had some experience with magnesium flash-light exposures in America. As a rule, they worked with a larger flame than appeared customary here, and more magnesium was used; but the light so obtained was diffused through a screen. By this means the shadows were less heavy. The Scovill Co. also issue the powder in the form of a cartridge, which is very effective. Some pictures done in this way he had already sent to the States for, and the Society might see them at a future meeting. He hoped to return the hospitality to some members of the Bath Photographic Society.

The CHAIRMAN thought it desirable to say a few words in connection with flash light work before experiments were made. In the first place, the process is the complement, though somewhat reversed, to what is usually regarded as instantaneous photography. Instead of the work being controlled by the rapidity of closing the camera, it is the rapidity of the light one has to deal with, as it commences and ceases with an instantaneous flash. Such a light we find in the combustion of the metal magnesium. The ordinary form used to be exhibited as a thin ribbon of the metal, but there was this disadvantage—that the light came almost from a point; thus some portions must be badly lighted or be in deep shadow. The present plan is to spread the metal in the form of powder over a larger surface, and for a shorter time. The powder, which should be fine, is burnt in a spirit flame, and, instead of proceeding from a point, it has a broad and a powerful light.

About a dozen cameras were then brought into requisition, and successful negatives were made of the Chairman and others,

Mr. A. Spurge manipulated the flashing apparatus during the evening, and a convenient dark room was fitted up for those who desired to use it.

The SECRETARY exhibited several large photographs lent by Mr. Rosen, of the Autotype Co. These illustrated the various coloured tissues in use for carbon printing, and comprised sepia, ruby brown, terra cotta, blue, and engraving black. Examples of collotype, auto-carbon, and auto-crayon were also handed round for inspection.

LEWES PHOTOGRAPIC SOCIETY.

AN ordinary meeting was held on January 7th, with Mr. J. TUNKS in the chair.

The balance sheet of the Lewes and Sussex Photographic Exhibition was read, showing a balance in hand of £9 16s. 1d., and was adopted.

At the conclusion of the usual business, the remainder of the evening was devoted to the making of lantern slides by contact; slides were exposed and developed by Mr. A. H. Webling, and the Hon. Secretary.

It has been arranged to offer certificate for competition amongst the members, once a quarter, for various subjects: the first competition will be for lantern transparencies.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

January 9th.—Mr. J. MATHEWSON in the chair.

The slides of last month's lantern slide competition were exhibited by the lantern. The variety of tone and range of density of the sets of slides was interesting, each set having been made from the same negatives.

Various detective camera pictures were exhibited. Fallowfield's "Facile" and Talbot and Eamer's "Diamond" detective cameras were on exhibition, and their working was explained.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A MEETING was held in the Mayor's Parlour, Old Town Hall, on January 8th, Mr. S. S. PARTRIDGE in the chair.

One member was elected, and one proposed for ballot at next meeting. Letters of resignation were read from Messrs. Toller and Ellery, which were accepted with regret.

The election of officers was next proceeded with, the following being the result:—*President*—Mr. S. S. Partridge; *Vice-President*—Mr. J. T. Cook; *Treasurer*—Mr. W. Sculthorp; *Secretary*—Mr. H. Pickering, High Cross Street; *Committee*—Messrs. Sculthorp, Wilson, Pierpoint, Porrett, Leeder, F. Brown, Blackwell, and Bankart.

It was decided to offer the following medals for competition among the members for the ensuing session:—Silver and bronze medals, by the Society, for the two best sets of six lantern slides; silver and bronze medals, by the Society, for the best and second best six prints whole plate; silver and bronze medals, by the past President, for prints under whole plate; and silver and bronze medals, by the President, for quarter-plate prints. It was arranged that the competitions take place as follows:—Lantern-slide competition, at the February meeting; enlargement competition, at the March meeting; print competition, at the April meeting.

RECEIVED.—"Tylar's Practical Hints and Photographic Calendar for 1890" is a skilful combination of useful information, handy for reference, and a comprehensive trade catalogue; it contains as frontispiece a specimen of Bemrose's photo-tint, reproduced from a negative by the Rev. F. C. Lambert, of the Chapel of St. John's College, Cambridge.——"The Photographer's Diary and Desk Book for 1890" is issued by the proprietors of the *Camera*, and, like its predecessor, is a handy quarto diary, interleaved with blotting-paper, and intended specially for the use of photographers. The formulæ are printed in a size of type that can be read without much difficulty under red light.——Another diary is the little pocket monthly forwarded by Messrs. Mawson and Swan. Spaces for daily notes and memoranda are interspersed with pages of price lists; this diary is to be obtained gratuitously on application to the firm.

Answers to Correspondents.

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

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

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

T. C. SELWYN.—To sensitize your rough paper for gas-light enlargements, coat it with gelatino-bromide emulsion, or try one of the papers already in the market, such as Eastman's or the Ilford bromide paper. See advertisements at page lxvi, and at the end of the YEAR-BOOK.

J. A. C.—The sulphuric acid test for bromine. Your failure is attributable to the fact that you operated directly upon the bromide paper, instead of charring this first to destroy the organic matter and concentrate the material. It would be well also to add a grain or two of black oxide of manganese to the vitriol, and instead of starch paper use starch paste at the end of a glass rod. The paragraph from *Nature*, on page 487, describes the fluorescein test, which is not so easily put in practice. Fluorescein is a phthalic acid and resorcein compound (containing no fluorine), and this body gives a pink eosine when submitted to the vapours either of bromine or iodine; it will not therefore distinguish between them, but only enable you to prove that one or the other is present. Pure nitrite of potash and fluoresceein are procurable from Messrs. Hopkin and Williams. We accept your thanks; no expenses were incurred.

E. L.—Mr. W. T. Wilkinson's little manual of "Photo-engraving and Photo-lithography," which treats also of the collotype and heliotype, is published by Messrs. England Bros., 25, Charles Street, Notting Hill, W. A new edition or a reprint is just now in course of preparation.

V. W.—The instruments named (the tachyscope and leucoscope) are not used in photography, but we will endeavour to get you the information asked for.

A. READ.—1. The camera mentioned (No. 2 Kodak) is just the size for lantern negatives, and contains the adjustments you require. 2. There is no doubt about the new celluloid films bearing enlargement quite as well as glass.

J. C.—We fail to see what advantage, even in weight, the new mode of extension would possess over the ordinary leather bellows action in cameras. As a temporary adjunct for enlarging, your idea would, perhaps, be of most service. The sketches are returned by post.

A. M. M.—For removing silver stains from the hands, there is nothing better than painting with a solution of iodine in iodide of potassium, and following up with a fairly strong hypo solution. A second application may be necessary in some cases.

W. R.—1. It is unfortunate that their interests are opposed, but we do not think that you should supply B without consent of A. Fuller particulars by letter. 2. Husnik's new enamel transfer paper is not yet offered for sale here.

GRAIN.—Set up a square of wire-gauze, and photograph that to get the reticulated screen required.

BLUE PRINT.—For working formulæ and full particulars, see the NEWS of 20th September last, and if you want further information, get a copy of "Modern Heliographic Processes," a manual of instruction for engineers, architects, and draughtsmen, by Ernst Lietze (New York: Van Nostrand Company).

J. M.—Varnish for gelatine negatives. Dissolve in the cold an ounce of orange shellac in a pint of methylated spirit, and after a day or two shake up with a small quantity of kaolin or prepared chalk (crushed whiting) to help to clarify the varnish. Allow to settle, and filter. Some operators use more shellac, but a thin varnish is all that is required to protect the negative, if care be taken to dry the paper well before printing.

A. W.—If you wish to exercise your privilege of nominating officers and members of council to serve for the ensuing year, remember that Tuesday next, 21st inst., is the last day for accepting letters addressed to the secretary, at 5A, Pall Mall East, S.W. The notice appeared in the December issue of the Society's *Journal*, at the foot of page 38.

C. S.—There is much truth in the remarks about British Art and the Processes of Reproduction, in the current number of the *Nineteenth Century*; but some error when the author asserts that all the photo-mechanical work is being done abroad.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

PURPOSE IN PHOTOGRAPHIC WORK.

MANY photographers have purpose enough in their work, namely, those who are engaged in the art-science professionally, so have their well-defined daily duties to the public before them, and are sometimes limited in those duties more than is pleasant to themselves by the uneducated taste of a considerable portion of the populace.

The photographer without a purpose is usually the professional or the amateur who takes out-door views occasionally, say of an attractive building or picturesque landscape, with no more deeply rooted object in view than that of obtaining a pretty picture. An accumulation of his photographs soon grows large enough to tire both himself and his friends, however well they may be executed.

This class of worker will discover that he has a higher mission in life when he has a definite object in view in his photographic work. An example has been set by Warwickshire of a method of utilising these photographic loafers—a word here used in its respectful sense—by setting them to work to make systematic historical pictorial records of the county in which they live. There is no reason why every photographer should not carve out such a line of action for himself. Those who live in London and its suburbs would in most instances be surprised to discover the wealth of historical subjects ready for photographic delineation to be found at their very doors. In the British Museum Library the historical information in relation to all parts of London and its outlying districts is abundant, and extends over many centuries, so that the photographer who goes there to read up the history of the district within a radius of one mile of his own homestead—or rather the homestead in which he is a temporary lodger under a lease—will discover that his immediate surroundings possess an interest unknown to him before, and as he perseveres in his reading and in his photographic work relating thereto, he will find himself gradually becoming the oracle of the neighbourhood in all matters of local history. Such relics of the past as modern improvements have not yet removed, he will photograph ere it is too late, and feeling the absurdity of trying to render his pictorial records more permanent by means of albumenised paper prints than the original objects themselves, he will plunge into higher branches of photography, such as relate to ceramic, platinotype, and carbon pictures, thereby doing service to the public, and building for himself a lasting reputation.

The tourist photographer can also go to work with a purpose. Instead of traversing a country and merely taking prominent architectural and other views which others have taken before him, he may devote a portion of his time to historical reading, and afterwards set to work to illustrate a particular subject, about which he will be able to tell a tale whenever he exhibits the pictures. For example, instead of bringing home a miscellaneous collection of scenes bearing no relation to each other, and the history which he does or does not pick up from guide-books, and soon forgets, he might resolve to follow in the footsteps of Joan of Arc, and photograph the scenes devoted to her history. First would come her birthplace, the little village in the Vosges, of Domremy sur Meuse, with its quiet woods and the ugly little church so different to the church imagined by the artists who paint theatrical scenes relating to her adventures; but many a tale could be told about the interesting interior of the ugly building and its time-honoured contents. He could visit Chinon and its magnificent ruined castle, in which she first met the king, and could photograph the portion of the ancient town which is rotting with age below the cliff on which the castle stands, the ancient buildings being preserved as much as possible by the French Government as national monuments. Then there is Orleans, baking under a summer's sun, with the broad and shallow Loire babbling over its stony bed. The city contains a museum all relating to Joan of Arc, but the objects in it, though ancient, are all ideal and of later date than her time. Then there is the Cathedral of Rheims, the most magnificent specimen of Gothic architecture north of the Alps, in which she crowned the king; and lastly, there is the picturesque city of Rouen, in which she was burnt, as popularly believed, though historical criticism has thrown some doubt upon this point. A series of photographs like these would be of abiding interest to the photographer and his friends, for children of older and younger growth always prick up their ears and brighten in the eyes, when he who shows them beautiful pictures has also a tale to tell.

THE ROYAL INSTITUTION.

IV.

BEFORE quitting the subject of the photographs brought under the notice of the Royal Institution by Thomas Wedgwood in 1802, it may be well to give some biographical particulars about that photographer himself.

He was the third son of Josiah Wedgwood, the world-renowned improver of English pottery manufacture. Josiah was born in July, 1730, and after he commenced business as a potter, by experimental research was enabled to produce new descriptions of earthernwares and porcelains, of studied forms and chaste style of decoration, so that after a time, England, instead of importing the finest goods of this class, began to export them largely. In 1786 he was the founder of an early Chamber of Commerce, which bore the name of "The General Chamber of the Manufacturers of Great Britain." His useful life closed January 3rd, 1795, in his sixty-fourth year. He had been for many years a Fellow of the Royal and Antiquarian Societies.

Nearly all that has hitherto been published about the life of Thomas Wedgwood will be found in Miss Julia Wedgwood's article published in these pages on the 20th of December last, in the second volume of Miss Eliza Meteyard's "Life of Josiah Wedgwood," London, 1866, and in another book mentioned farther on by the same authoress.

Miss Meteyard says, in the 1866 book, that Thomas Wedgwood was born in April, 1771, and named after his paternal grandfather, uncle, and cousins; he was the fifth Thomas Wedgwood in direct line. She had no particulars of his infancy. From the first he seems to have been in delicate health, derived probably from both his parents, who prior to his birth had been in impaired health. These seeds of organic disease subsequently rendered the life of Thomas Wedgwood an indescribably weary burden. At first he was a merry little fellow, full of fun, and the life of the household. Later on he became the hardest of students, and with his father's chemist (Alexander Chisholm) rendered the laboratory at Etruria a place at which, for scientific reasons, the *savants* of our day cast back their gaze to penetrate, if possible, some of the mysteries of the photographic art carried on there. His passion for abstract studies was unbounded, even at the age of sixteen. He studied mathematics under John Leslie, afterwards Professor in the University of Edinburgh, and he often worked far into the night, causing his father on several occasions to deplore that "Tom is hurting himself." Whilst health lasted he joined in athletic pursuits, and he formed one of a body of young men known as "The Staffordshire Bowmen," who met for regular drill and exercise with the bow, and wore a handsome uniform. By instruction under Webber, he became a skilful draughtsman.

Miss Meteyard continues that from love of art he paid brief visits to Germany, Florence, and Venice, and at home for a time he seems to have been skilful as a potter. He designed new patterns, and his scientific researches led to the invention of what is known as "silvered ware," namely, a pattern of dead or burnished silver upon a black earthenware body. The earliest record of this ware is dated February, 1791. Nitrate of silver was sent down to him from the Apothecaries' Hall at the time of these experiments, and its properties led to the discovery of the method of taking photographs nearly forty years before the announcement of the discoveries of Nicephore Niepce and Daguerre.

The most detailed biographical particulars extant of Thomas Wedgwood are in Miss Meteyard's "A Group of Englishmen" (Longmans: London, 1871). In it she sets forth that Thomas Wedgwood was born in May, 1771; he was considered "the humourist" of the three sons. In 1779 he went as a boarder to the school of the Rev. Phillip Holland, Unitarian minister, Bolton. In 1788 a project to send him to Rome was abandoned, and throughout 1789 Thomas Wedgwood appears to have pursued his studies at home at Etruria. In 1790 Leslie, the mathematician, resided in the house for some time as his tutor. In his sixteenth year Thomas Wedgwood sent to London for a copy of "Newton's Optics," for he began to be interested in the subjects of light and heat, and Priestley encouraged him in his researches by letters written in 1791-2. The results were the two papers about light and heat, by Thomas Wedgwood, which were read before the Royal Society, and appeared in "The Philosophical Transactions" for 1792. Miss Meteyard says: "It is curious to observe how much the experiments narrated in the earlier paper were made with substances used in his father's manufactory, or arranged in his collection of fossils." About this time he was in correspondence with Richard Lovell Edgeworth about the improvement of prisons in the matter of sanitary arrangements. Thomas Wedgwood passed some portion of 1796 or 1797 at the Pneumatic Institute at Clifton, for he was nearly always in bad health, and in 1797 he resided occasionally with his brother John, at Cote House, Westbury, Wiltshire; in fact, he sought relief from his ailments by change of scene and of society, and in this year he made the acquaintance of Humphry Davy at Penzance. In 1798 he was, for a time, at Stowey, in companionship with Coleridge and other poets, and in the same year he and his brother Josiah offered Coleridge an annuity of £150 a year, to relieve him from the necessity of employing himself as Unitarian minister; this offer was accepted. In 1799 he bought an estate near Bridgewater, one portion of which, upon which he resided, was known as Castle Fleury, where he gave a little attention to agriculture; he also this year bought more landed property at Gunville, near Blandford, in Dorsetshire. In 1800 he appears to have travelled a little in France, and the same year, in search of health, he went to the West Indies and back; it was probably thought that he would never return, for before leaving England he made his will. He then bought another estate, Eastbury, near Gunville, and about the same time wrote to Mr. Howship, in York Street,

London, to buy for him a book translated from the German, "The art of preserving feeble life under incurable diseases." In 1801 he visited Paris. In the beginning of 1802 he was at Gunville, and in March the same year, about the time when his photographic discoveries were made known at the Royal Institution, he was in London for the purpose of consulting Dr. Baillie and arranging a fresh trip to the Continent, for both the hypochondriacism and *tedium vitæ* from which he suffered had increased, and alarming symptoms had begun to show themselves. Writing at the close of March to his brother, he says:—"God knows what will become of me at present, but I suppose I shall be driven to travel. I have had many painful conflicts of mind from imagining that I had only to forget that I was an invalid to be like other people, and get well. I now know that my body is seriously damaged; my feelings and views are undergoing a change in consequence." During this visit to London he spent his time occasionally at his club, which met at the "Crown and Anchor" in the Strand. He seems to have taken little interest in those photographic discoveries which will for ever render his name famous; in fact, we do not know of a single utterance of his own about them, unless he took part in the writing of the paper on the subject which was read at the Royal Institution, but the probability is that all the writing and speaking on this subject were done by Davy. Wedgwood left London May 7, 1802, for the Continent, and was four hours in crossing to Calais; thence he went *via* Bruges and Ghent to Brussels. On May 17th, 1802, he wrote a long letter about his experiences there, and a few days later he wrote, in much better spirits, from Mons. Afterwards he seems to have been in Paris and Switzerland, and to have returned to England in the autumn of the same year. He travelled much on horseback; indeed, constant motion, whether on the sea or on horseback, seems to have given him more relief from his ailments than anything else.

James Watt visited Etruria in 1790, and afterwards, in the course of a letter to Mr. Josiah Wedgwood, said:—"Thank you for your directions for the silver pictures." This may either be the first written record relating to Thomas Wedgwood's early photographs, or may bear reference to pictures upon pottery, produced by the aid of silver salts.

There is no record that Davy and Thomas Wedgwood met in 1802, but as Wedgwood was in London when Davy made known his photographic discoveries in that year, the assumption is that they saw each other on the subject, especially as Wedgwood was then well enough to be frequently riding or driving about town.

At the end of 1802, Wedgwood was travelling in South Wales, and buying more landed property; the latter habit seemed to be a kind of mania with him when his malady was at the worst. This malady was more of a mental than a bodily nature, and in 1803 he wrote to Humphry Davy to try to obtain for him some Indian hemp, fortunately without success. Davy, in the course of his reply, dated Royal Institution, February 12th, 1803, said:—"I have always looked forward with hope towards a time when your health would permit you to act upon the public by truths which cannot fail to enlighten and to be useful to all classes of men. I trust that time will yet arrive. Believe me, I always look back to the few hours that I have spent with you with feelings of pleasure, of gratitude, and of regret. Your opinions have been to me as a secret treasure, and they have often enabled me to think rightly, when perhaps, otherwise, I should have thought wrongly."

In 1803 Wedgwood was again on the Continent for a short time, and may have reached Italy, but was soon back in London, and at the end of the year was exceedingly ill at Cote, near Bristol. In the following April he sought relief by taking opium.

He died at Eastbury July 10th, 1805, at the age of thirty-four. Miss Meteyard says that by his death "all the anxieties of many friends and many men on his behalf were at an end for ever. Dr. Darwin, of Shrewsbury, had long anticipated that his life would close in frenzy or paralysis. The last was the merciful ordination. In an instant the brain was stricken. He ceased to all outer volition and consciousness, and calmly died no long while after."

He is described as having been tall, thin, pale, and sickly, moving feebly by the aid of a stick about the grounds at Eastbury; staying occasionally to watch with interest his brother's children at play, and remarking as he did so that he would give half his fortune if he could possibly partake of their health and buoyancy of spirits.

There is no evidence that Thomas Wedgwood did anything in photography before producing the pictures to which he drew Davy's attention in 1802, but he and his father made use of the camera obscura, as others had done, before that time. Miss Meteyard, whose utterances are of no scientific value, says in a letter read at a meeting of the Photographic Society, November 3rd, 1863, "You may with safety refer the first experiments in photography to as early a date as 1790 or 1791. In the latter year I find Thomas Wedgwood (third surviving son of Josiah Wedgwood) sending his camera to Birmingham to be mended." She does not give her authority for this statement, and it would have had no bearing on the subject had she done so.

At the meeting, the two photographs said to be by Wedgwood were passed round, and the official report of the Society says that one was "about 8 by 6, a view of a breakfast table, having much the appearance of a faded silver print; and another similar in appearance, a small reproduction of a drawing." In the discussion, "Mr. Foster asked by whom the date 1791 had been written on the frame of the Wedgwood pictures. It was somewhat singular, if these were produced in 1791, that Wedgwood should write in 1802 that no means of fixing sun pictures had then been discovered." Mr. Malone remarked at the meeting, "These pictures certainly, or at least one of them, appeared to be a photograph, and reminded

him of some of Mr. Talbot's early pictures; indeed he had seen some of them with just the same objects. So far as he could see, there was nothing to connect the pictures with the early date assigned to them. . . . Iodine was not discovered until after the alleged date of these pictures."

At another meeting of the Photographic Society, held January 5th, 1864, the secretary exhibited a print which he had found at home, and executed by Mr. Fox Talbot, which was very similar to that exhibited at a former meeting as "The Breakast Table at Etruria Hall," by Thomas Wedgwood, photographed in 1791. He had written to Mr. Fox Talbot on the subject, who, in the course of a reply dated Milburn Town, Edinburgh, November 10th, 1863, said:—"I beg to inform you that I *did* make a photograph of china, knives and forks, &c., disposed upon a round table, which is seen very obliquely in the photograph. It was an early attempt, about 1841 or 1842. The view was taken out of doors, on the grass-plot in the centre of the cloisters of Lacock Abbey. I have no doubt I have copies of it still left in my collection at Lacock. Wedgwood, in his memoir of 1802 (Journal of the Royal Institution), says that he had thought of the possibility of making the photographic views with a camera, but that, on trying the experiment, he had found that no length of time sufficed to make any visible impression. Therefore, if any ancient photographs should be discovered, they will not be his production." In a later letter from the same place, he expressed the belief that he had the negative of this picture at Lacock Abbey. At the same meeting of the Photographic Society, Mr. Malone "produced a collection of photographs done twenty years ago by Mr. Talbot, amongst which was a print which appeared to him to be identical with that picture shown before as having been produced by Thomas Wedgwood. That was the only one of the paper pictures he before believed to be a photograph; and he was now able to settle the matter of its production as belonging to Mr. Talbot."

Altogether, there is no doubt that the two pictures described in Miss Meteyard's books as early photographs by Wedgwood were not such. They condemned themselves, for they were positives and not negatives; moreover, any photographs taken by his method and unfixed, could not last long. The breakfast table picture was published in her "Life of Josiah Wedgwood," and the man with the bagpipes picture as a frontispiece to her "Group of Englishmen." The latter was a positive copy of an engraving, and probably not a photograph at all.

Thomas Wedgwood wrote but little for publication. His first paper, read before the Royal Society, relates to phenomena of light, phosphorescence, and fluorescence, so is appended hereunto in full.

*Experiments and Observations on the Production of Light from Different Bodies, by Heat and by Attrition.**

BEFORE I begin to state the experiments which are the subject of this paper, it may not, perhaps, be improper to give a very compendious history of the discoveries which have already been made relative to phosphoric bodies; omitting, however, the electrical phosphori, and such as are evidently consumed or decomposed in the emission of their light, as these are well known, and are too numerous and important to be slightly noticed.

Pliny was well acquainted with the luminous appearance of rotten wood and of the eyes of dead fish. From this time I find nothing relative to the phosphorism of bodies till the beginning of the sixteenth century, when Benvenuto Cellini, in his Art of Jewellery, mentions his having seen a carbuncle shine in the dark like coals nearly burnt out, and relates a story of a coloured carbuncle having been found in a vineyard, near Rome, by its shining in the night.

About the year 1639, Vincenzo Cascariolo, of Bologna, discovered, by accident, that when a certain stone, found in that neighbourhood, was calcined in a particular manner, it acquired the remarkable property of absorbing the light of the sun, of retaining it for some time, and of emitting it in the dark; subsequent experimenters found it to do the same with the light of a candle.

In 1663 Mr. Boyle observed a particular diamond to give out a light almost equal to that of a glow-worm, when heated, rubbed, or pressed, and investigated very fully the nature of the light of dead fish, flesh-meat, and rotten wood.

In 1677 Baldwin, of Misnia, discovered in the residuum of a distillation of chalk and nitrous acid, a phosphorus similar in its properties to the Bolognian, but not possessing the phosphoric virtue in so eminent a degree.

In 1705, Mr. Francis Hawkesbee found that glass rubbed on glass, in common air, in the vacuum of an air-pum, or under water, "exhibited a considerable light."

In 1724, M. Du Fay discovered that almost all substances which could be reduced to a calx by fire, or after solution in the nitrous acid, absorbed and emitted light like the phosphorus of Cascariolo and of Baldwin; and that some diamonds, emeralds, and many other precious stones emitted light in the dark after being exposed to the rays of the sun.

About the same time Bucaria, of Turin, found almost every body in nature to be luminous after a similar exposure; he added, too, this very important discovery, that an artificial phosphorus exposed to the light in a coloured glass vial emits, in the dark, rays of the identical colour of the vial. Mr. Margraaf, by an analysis of the Bolognian stone, shows that it contains vitriolic acid united to calcarious earth, and that al gypseous stones treated like the Bolognian, provided they are pure from iron, become phosphorescent. About the year 1764, Mr. Canton made a phosphorus of sulphur and oyster-shells calcined together, and distinguished himself by many curious experiments made with it. He found that his phosphorus might be made to shine by heating it after it had ceased to be luminous of itself, but that the same heat would have this effect for a certain time only. Heat has been observed by several of these philosophers to promote the emission, and to shorten the duration, of the light of phosphori. Fluor has been long known to give a fine, bright light when heated. D. Hoffman discovered that red blende and feldspat were luminous when pieces of either were rubbed together. Pott extended this discovery to all pure flints and crystals, and to porcelain. Keysler found glacier mariæ to be luminous when heated. M. de la Mitherie has observed some neutral salts and calcareous earths to be luminous in the same way. The Count de Razoumowski, in a memoir of the Physical Society of Lausanne, shows that quartz and glass give out light when struck by almost any hard body, and that some few other bodies are luminous when pieces of the same kind are rubbed upon one another. He finds quartz to give out its light under water.

This brief account includes, as far as I am able to collect, the chief discoveries which have been made concerning luminous bodies. I was led to make the following experiments from observing the light which proceeds from two quartz pebbles rubbed against each other. I searched for this property in many other bodies with success, but met with two soft stones, which did not afford any light upon the most violent attrition, conceiving the

* By Mr. Thomas Wedgwood. Communicated by Sir Joseph Banks, Bart., P.R.S. Read December 22nd, 1791.

heat might probably be the cause of the light emitted by quartz from attrition. I attributed this failure to a want of sufficient hardness in these friable stones for producing the necessary heat. Accordingly, sprinkling some of their powder on a plate of iron nearly red hot, I had the satisfaction to observe it emitting a considerable light. Extending this mode of trial, I found that the phosphorism of almost all bodies might be made apparent either by heat or attrition. I shall therefore divide the subject of this paper into two parts :—1. On the light produced by heat. 2. On the light produced by attrition.

I.

The best general method of producing the light by heat is, to reduce the body to a moderately fine powder, and to sprinkle it, by small portions at a time, on a thick plate of iron, or mass of burnt luting made of sand and clay, heated just below visible redness, and removed into a perfectly dark place.

The following is a list of such bodies as I have found to be luminous by this treatment, arranged according to the apparent intensity of their light.

1. Blue fluor from Derbyshire, giving out a fetid smell on attrition.

2. Black and grey marbles, and fetid white marbles, from Derbyshire. Common blue fluor, from Derbyshire. Red feldspat from Saxony.

3. Diamond, oriental ruby, aerated barytes, from Chorley, in Lancashire, common whiting, Iceland spar, sea shells, moorstone, from Cornwall, white fluor from Derbyshire.

4. Pure calcareous earth, precipitated from an acid solution —argillaceous earth (of alum), siliceous earth,—new earth, from Sydney Cove, common magnesia, vitriolated barytes, from Scotland. Steatites, from Cornwall, alabaster, porcelain of Cornwall. Mother of pearl, black flint, hard white marble, rock crystal from the East Indies. White quartz, porcelain, common earthenware, whinstone, emery, coal ashes, sea sand.

5. Gold, platina, copper, iron, lead, tin, bismuth, cobalt, zinc. Precipitates by an alkali from acid solutions of gold, silver, copper, iron, zinc, bismuth, tin, lead, cobalt, mercury, antimony, manganese. Vitriolated tartar, crystals of tartar, borax, alum (previously exsiccated), sea-coal. White paper, white linen, white woollen (in small pieces), white hair powder, deal sawdust, rotten wood (not otherwise luminous), white asbestos, red irony mica, deep red porcelain.

6. Antimony, nickel, oils, lamp, linseed, and olive, white wax, spermaceti, butter (luminous at and below boiling).

The duration of the light thus produced from different bodies is very unequal ; in some the light is almost momentary, in others it lasts for some minutes, and may be prolonged by stirring the powder on the heater. It soon attains its greatest brightness, and dies away gradually from that point, never appearing in a sudden flash, like the light of quartz pebbles rubbed together. If blown upon, it is suddenly extinguished, but immediately re-appears on discontinuing the blast.

The light of bodies is, in general, uncoloured ; there are, however, some exceptions. Blue fluor, of that kind which gives out a fetid smell when rubbed, first emits a bright green light resembling that of the glow-worm so exactly that when placed by the insect, just as it has attained its greatest brightness, there is no sensible difference in the two lights, either of colour or intensity. This bright green changes into a beautiful lilac, which gradually fades away. Fetid marbles, and some kinds of chalk, give a bright reddish or orange light ; pure calcareous earth, a bluish white light ; Cornish moorstone emits a fine blue light ; powder of ruby gives a beautiful red light of short continuance.

The most phosphorescent marble is soft and friable, of a coarse crystallized grain, and a fetid odour when rubbed ; black and grey marbles are generally more luminous than the white.

Most of the common white marbles are hard, and of a fine grain, and they are not very luminous, nor is their light of an orange colour. Different chalks vary as much as different marbles in the intensity and colour of their light when no difference of external structure is perceptible. The most phosphorescent chalk loses the brilliancy and redness of its light by being dissolved in an acid, and precipitated by caustic fixed vegetable alkali—by being confined with vitriolic or fluor acid—by calcination by heat, or being combined with the aerial acid in the pellicle formed on the surface of lime-water. Marble would probably be affected in the same manner. The most phosphorescent blue fluor gives the same light after being united to the vitriolic acid, though gypsum is far less luminous than fluor, and its light is colourless. Argil precipitated from alum by an alkali, and magnesia, when combined with fluor acid, give out the same light as before.

Bodies emit their light when immersed in boiling acid of vitriol, or in boiling oils. Small lumps of fluor or of marble make a singular appearance in the acid, as they are moved up and down by its action, and rendered brightly luminous by the heat. They seem equally luminous in pure, fixed inflammable or atmospheric air.

Feldspat, the fetid fluor, and probably all phosphorescent bodies, dropt in moderately fine powder, into a flask containing a small quantity of boiling oil at the bottom, emit a copious flash of light as soon as the powder touches the surface of the oil. When the particles of the body have lain at the bottom of the heated fluid for about a minute, they become but faintly luminous ; if the flask be then agitated so as to raise some of these particles out of the oil, and lodge them on its sides, they suddenly rekindle into the same brightness as at first, and preserve this reassumed lustre for some time ; and even after being washed down again into the oil, they may be readily distinguished from the particles which have remained at the bottom. This experiment is extremely beautiful, and is not at all obstructed by the faint light of the oil ; it succeeds best with the stinking blue of Darbyshire.

Powdered marble, and probably every other body, when spread upon the heater in the receiver of an air-pump, is equally luminous during the exhaustion and readmission of the air.

Bodies are by far the most luminous the first time they are treated, but cannot, perhaps, be entirely deprived of this property by any number of heatings, nor by any degree of heat. Chalk, fluor, and feldspat, give out a very faint light on the heater, after having been exposed to a smart red heat in an open crucible, in small quantities, and kept frequently stirred for several hours ; the feldspat was equally luminous when laid hot upon the heater, or first cooled, and then laid on. Chalk and fluor were not tried in this particular. A bit of glass, melted in a heat of 120° of my father's thermometer, and as soon as it is cold reduced to powder, gives out light on being thrown upon the heater below redness. Quartz, from the same original piece, is equally luminous when the *powder* is directly thrown upon the heater—when it is previously made red hot, and then cooled and thrown on—or when a *fragment of some size* has been made red hot, then pounded and thrown on.

For the most part, the softest bodies require the least heat to become luminous ; marble, chalk, fluor, &c., give a faint light when sprinkled on melted tin just becoming solid. As the temperature of the heater is raised, they continue to give out more and more light.

Vitriols of iron, copper, and zink previously exsiccated, when thrown on earthenware or metal made nearly red hot, give minute flashes of light of momentary duration, such as appear from some of the metallic precipitates, particularly zink, on a similar treatment ; with this difference, however, that the light of most of the precipitates is of a reddish hue.

The light of the metals is white, and exactly similar to that of some earths.

White paper, when dipped in a solution of sal-ammoniac, and slowly dried, becomes black upon the heater, and then gives out much less light than common paper.

If a lump, of the size of a small bean, of fluor, marble, feldspat, or any other of the most phosphorescent bodies, be laid upon the heater, the light proceeds gradually upwards from the part in contact with the heater, till the whole mass is thoroughly illuminated. If the same piece be heated a second time it is much less luminous ; nor if it be broken are the

fragments at all more luminous, either then, or after having been exposed for a month to the light and sunshine.

A little boiling oil at the bottom of a glass flask, when agitated in the dark, illuminates the whole of the flask. The light of boiling oils proceeds, probably, from some kind of inflammation, as it is scarcely discernible unless the vessel be agitated; and, if a little oil be thinly spread on the heater, a subtle lambent flame of a bluish hue instantly arises. The same thing takes place if horn, hair, saliva, or any animal matter be laid upon the heater.

II.

The experiments on the lights produced from different bodies by attrition were chiefly made by rubbing in the dark two pieces of the same kind against each other. All that I tried, with very few exceptions, were luminous by this treatment. The following is a list of them, arranged in the order of the apparent intensity of their light, and as the lights are either white or some shade of red, I have affixed figures to denote these differences. (0) Denoting a pure white light; (1) the faintest tinge of red or flame colour; (2) a deeper shade of red; (3) and (4) still deeper shades.

1. Colourless, transparent, oriental rock crystal; and siliceous crystals (0).
2. Diamond (0).
3. White quartz, white transparent agate (1).
4. White agate, more opake (2); semi-transparent feldspat from Scotland (2).

Brown opake feldspat from Saxony (4)

Chert, of a dusky white, from North Wales (3).

5. Oriental ruby (4).
6. Topaz, oriental sapphire (0).
7. Agate, deep-coloured, brown and opake (4).
8. Clear, blackish gun-flint (2).
9. Tawney, semi-transparent flint (3).
10. Unglazed white biscuit earthenware (4).
11. Fine, white porcelain (2).
12. Clear, blackish gun-flint made opake by heat (3).
13. Flint glass (0).
14. Plate-glass, green bottle glass (0).
15. Fine, hard loaf sugar (0).
16. Moorstone from Cornwall (1); Corune, semi-transparent, from the East Indies (1).
17. Iceland spar (0).
18. White enamel (2); tobacco pipe (3).

White mica (0).

19. Unglazed biscuit earthenware, blackened by exposing it, buried in charcoal, in a close crucible to white heat (4).
20. *Black vitreous mass, made by melting together 5 of fluor, 1 of lime, and some charcoal powder (4).
21. Fluor, aerated and vitriolated barytes, white and black Derbyshire marble, calcareous spar, crystals of borax, deep blue glass, mother-of-pearl.

Rock crystal, quartz, flint glass, and many other hard bodies, during attrition, emit now and then reddish sparks of a vivid light, which retain their brightness in a passage of one, two, and even three inches through the air.

A piece of agate applied to the circumference of a wheel of fine grit revolving at a moderate rate, becomes brightly red, even in daylight, at the touching part; if the wheel revolve at a quicker rate, the touching part emits a pure white light. In both cases glowing sparks are continually emitted, some of which are not extinguished before they have passed twelve or fourteen inches through the air; they explode gunpowder and inflammable air, and burn the skin; their brightness is not sensibly increased by passing into pure air. The corner of an angular piece of window-glass being applied to the wheel in motion, a full eighth of an inch of the glass above the point of contact becomes, apparently, red hot, and retains the redness for a second or two of time after its removal from the wheel. During the attrition, large red sparks are continually emitted, and a mixture of softened glass and the sand of the stone wheel is collected about the touching point.

Quartz, transparent agate, rock crystal, and window glass, give nearly the same flashing light when rubbed against the stone wheel, or in the ordinary manner. Excepting the tinge of red in the former, which it receives from the light of the grit, the transparent agate becomes red hot for a little way about the part in contact with the wheel, and is thus deprived of its transparency as it would be if made red hot in a common fire; porcelain is heated to redness by the same treatment. The red sparks which are emitted by all these bodies during their attrition are heated particles about the magnitude of grains of fine sand, broken off by the friction.

Bodies give out their light the instant they are rubbed against each other, and cease to be luminous when the attrition is discontinued. Colourless, transparent, and semi-transparent bodies emit a flashing light, their whole masses being for a moment illuminated. Opake bodies give little more than a defined speck of red light, and are not luminous below the part struck. The greatest apparent quantity of light is produced by hard, uncoloured, transparent, and semi-transparent bodies, whose surfaces soon acquire an asperity by rubbing together, as quartz, agate, &c. From an examination of the table it appears that white lights are emitted from colourless transparent bodies; faint red or flame-coloured from white, semi-transparent bodies; deeper red from more opaque and coloured bodies: and the deepest red from opaque and from deep-coloured bodies. Extremely faint lights, such as those given by fluor, marble, &c., are of a bluish white: quartz, very lightly rubbed, gives a very faint light of a bluish hue; when rubbed a little harder, it emits a flame-coloured light; when rubbed with violence, its light approaches to whiteness. Opaque red feldspat gives a deep red light by attrition: exposed to a strong heat in the furnace, it becomes white, and somewhat transparent; and when cool, gives out, on attrition, as white a light as quartz. Clear, blackish flint, made opaque by heat, gives a redder light than before; deep-coloured glass gives out a red defined light without any flash, whilst clear, uncoloured glasses emit a white flashing light of some brightness.

Bodies are not luminous by simple pressure; the fragments rubbing on each other produce some light. Mr. Boyle, indeed, found a particular diamond to emit light when pressed by a steel bodkin, but the diamond is phosphorescent in so many ways, and is so curious and singular a body, both in properties and constitution, that it can scarcely be expected to exhibit the same appearances as the common class of earthly bodies.

Alum, indurated by having been kept long in a state of fusion, and being then much harder than loaf sugar or borax, both which are luminous from moderate attrition, gives no light, though rubbed with much violence.*

If two pieces of glass or quartz be strongly rubbed against each other, and then applied to the fine down of a feather, the down is not sensibly affected; if the same glass be rubbed on woollen cloth, and placed near the feather, the down is immediately attracted.

Rock crystal, quartz feldspat, white, unglazed earthenware, Derbyshire black marble, and probably all phosphorescent bodies insoluble in water, give out their light on rubbing them under water, as copiously as in air. Hard, white sugar from the outside of the loaf gives out its light when rubbed in oil. Bodies seem equally luminous in atmospheric, pure, fixed, and inflammable air.

All hard, earthy bodies emit a peculiar smell on attrition. The most remarkable for this property are chert, quartz, feldspat, biscuit earthenware, and rock crystal; this smell does not differ much in kind, though it does considerably in inten-

* Some of this mixture, taken out of the crucible before it was perfectly fused, gave out when rubbed, a strong smell like phosphorus of urine, and on throwing some of it pulverised on a plate of iron, heated just below redness, it was very luminous, and presented every appearance of burning phosphorus.

* The Count de Razoumowski has investigated the luminous property of bodies in a way which appears to me very unfavourable for the discovery of their true lights. He rubbed, not one piece against another of the same body, but all of them against quartz or glass. He finds several metals luminous from this treatment, and attempts to draw some curious conclusions from the colour of their lights. I tried these metals in his own way, and found that no light was emitted, except when the violence of the blow shattered the quartz or glass. A piece of the indurated alum will excite light from rock crystal, but this is the light of the fragments of the crystal rubbing on each other, and not of the alum.

sity. Many of the softer bodies yield the same smell, but in a less degree, and probably none are entirely without it. It appears to be strongest where the friction is greatest; it has no dependence on the light produced by attrition, as it is often very strong when no light is emitted.

Rock crystal, quartz, feldspat, white biscuit earthenware, and probably all such hard bodies, produce this smell under water.

Quartz stones, violently rubbed upon one another for a few minutes in a cup of water, communicate this smell and a peculiar taste to the water. The taste is probably derived from an impalpable powder, which floats in the water for many days.

Derbyshire black marble, and the stinking blue fluor, give out, on attrition, a strong smell peculiar to themselves, both in air and water; they lose this property by being once made red hot.

Quartz produces the smell equally strong in fixed, pure, and common air.

Having now stated all the facts relative to phosphorescent bodies which I have as yet been able to discover, I shall beg leave to offer a few reflections, tending to show that heat is the probable cause of the light produced from bodies by attrition.

The powders of all earthly bodies emit light when heated a little under redness. Now, when two bodies are rubbed upon each other it is probable that heat is always generated on their surfaces; may not then the light which they yield upon attrition be attributed to a sudden heating of particles in their surfaces? For these particles will be affected in the same way as if they had been equally heated by any other means; they will, therefore, give the same light as if they had been laid upon the heater of an equal temperature.

The shining sparks which hard bodies send out during attrition prove that particles in their surfaces are heated at least to more than 600° of Fahrenheit, for the powders of hard bodies are not luminous on a heater much below redness. The heat generated by soft, friable bodies is probably but little, as the minute particles in their surfaces are not much crushed by each other, but merely disjointed from the masses; nor can this little be easily appreciated, for, as the surfaces continually crumble away, the heated parts are carried off before they can warm the masses, and are themselves very quickly cooled by the surrounding air. But as many soft bodies emit a faint light on the heater at the low temperature of about 400° of Fahrenheit, and as it is not a stronger light which they yield on attrition, little heat is required to render the particles in their surfaces luminous. It must be observed, too, that though the absolute quantity of heat generated by one rub be but inconsiderable, the effects of it may be very striking; for just on the instant of attrition its action is confined to the minute colliding points of the surfaces, and will, consequently, operate upon them as much as a greater quantity would on larger points.

The light emitted by bodies in attrition is of momentary duration, wheras a powder on the heater continues to emit light for some minutes; this difference is easily explained. In the latter case the particles are constantly heated; in the former they are instantly cooled by the subjacent mass to a temperature in which bodies are not luminous, *i.e.*, a little under 400° of Fahrenheit.

When the uneven surfaces of bodies are rubbed upon each other, a flashing light is produced at frequent intervals by the collision of the more prominent parts; this, in colourless, transparent, and semi-transparent bodies is copiously reflected from the whole of the masses, and forms an appearance very different from what is ever exhibited by bodies on the heater. It may be well illustrated in the upper part of a candle, by repeatedly nearly closing and quickly opening the snuffers about the burning wick, or by sprinkling some powder of fluor, or marble, on a mass of glass heated just under redness.

Powder of crystal, quartz, agate, &c., is but faintly luminous on the heater under redness; accordingly, if the stones themselves be gently rubbed a faint light is emitted, resembling that which their powders give on the heater. Marble and fluor give about the same light on the heater of the temperature of 100° as they do when rubbed; and, probably, attrition heats some particles in their surfaces to that degree.

It may, at first, seem an objection to the opinion of heat being the cause of the light produced from bodies by attrition, that they yield their light when rubbed under water; but the water acts differently to the air only as being a stronger conductor of heat, and can nowise impede the actual generation of the heat. Now, as bodies emit their light on the very instant of their being heated, the water cannot cool the hot particles before they have given their light.

It is easy to see why bodies emit light *instantly* when rubbed, for they often send out sparks as soon as the attrition commences, which proves that particles in their surfaces are instantly heated to redness by attrition.

Since hard bodies may be heated to redness by attrition, we have an excellent method of discovering the lights they give out at that temperature, which could not be effected by sprinkling their powders on a red hot heater, as the light of the powder would be mixed with that of the heater. In some cases of attrition bodies are raised to a temperature beyond visible heat. The corner of an angular piece of window glass being applied to the circumference of a revolving wheel of fine grit, part of its mass is worn away; but a larger portion, lying just above the abraded part, is heated to redness. Now, as all the heat which is there collected, and a great deal more which is carried away in the abraded part, and conducted off by the air and by the glass lying up to the red hot portion, has once occupied a smaller space in the part worn away, it follows that the abraded portion, or aggregate of heated surfaces, has been heated to a degree exceeding redness by all the heat remaining in the red-hot part, and by the quantity of heat conducted off by the air and adjacent glass; and, consequently, that each surface has been heated by the attrition to a degree as much exceeding redness.

I am aware that this reasoning is founded, in part, on the supposition that the heat is generated on the surface or outermost coat of the body; some of it may undoubtedly proceed from an agitation of the parts under the surface, but the emission of red hot sparks at the *instant* of attrition proves that a great heat is generated on the surface; and as the friction, or apparent heating cause, is so much greater there that the parts are forcibly broken and disjointed, whilst just beneath there is no perceptible alteration in the body, we may venture to conclude that the heat generated beneath the surface is but inconsiderable.

After all, it remains entirely problematical, in what manner heat operates to produce light from bodies; the air does not seem to have any concern in its production, as bodies are equally luminous in almost all kinds of air, and when immersed in liquids. The phosphorism of sugar is probably of a different kind from that of the earthy class; for, although so soft and friable a substance, it produces its light very copiously upon gentle attrition.

In speaking of the attrition of bodies upon the stone wheel, I have said that they became *red hot* about the touching part; I should not have made use of this expression if the luminous sparks which issued from them had not kindled gunpowder and inflammable air, and thus proved that the part from which they came was raised to a temperature at least equal to what is usually termed a red heat; for, till the temperature of the part touching the wheel had been thus ascertained, I attributed the whole of the light emitted to the common phosphorism of bodies. If the velocity of the wheel be much increased the touching part of the body applied emits a bright, white light, much more vivid than any which powders ever give out on the heater, and, probably, the temperature of the luminous part is equal to what is usually called a *white heat*.

Having thus made incombustible bodies red-hot without the aid of fire, I once conceived that all the light which they emit when heated to redness in the fire, proceeded from their great phosphorism, for I could not suppose that they absorbed light from the burning fuel and emitted it again at the same time, and during a continuance of the same circumstances. It appeared, however, equally inexplicable why a stone put into the fire should continue to shine from its own light with

undiminished lustre as long as the fire is kept up; for it has been shown that if a phosphorescent body remain long upon the heater, of any temperature between 400° of Fahrenheit and a red heat, its light diminishes more and more till at last it is scarcely perceptible; and then an increase of heat is necessary to render it more luminous.

APPENDIX.

After a considerable part of the above paper was printed, I repeated the experiment with boiling oil, as previously related, with every possible precaution; I poured the powder into the flask through a funnel which reached to the bottom, so that none of it might be lodged on the sides; for, not having attended to this circumstance before, I was apprehensive that the experiment was delusive, and that the agitation of the hot oil might have washed down some fresh particles which had not been before heated; then slowly pouring in a little oil, I boiled it for a few minutes and removed it into a dark place. When the powder had become but faintly luminous upon agitation, the experiment succeeded exactly. I then boiled and agitated the oil for six or seven times successively with the same result, except that the light of the powder grew something fainter each time. If anyone has the curiosity to repeat this singular experiment, he may attend to the following directions:—Upon each removal from the fire, stop the neck of the flask with a cork having a small hole pierced through it; wrap the neck round with tow, agitate the liquor by quickly raising and lowering the flask.

The spark which leaves the surfaces of hard bodies during attrition may be exactly imitated by burning a bit of dusty paper; the particles of dust are carried by the current of air through the blaze, and are made red hot in their passage.

THE BEST PHOTOGRAPHER.

BY FRED. HART WILSON.

THAT to a great many people the photograph gallery is a place "hedged about with terrors" is unfortunately indisputable. Over its door might be written, "All hope (of looking natural) abandon, ye who enter here." The reception room may hold gorgeous carpets, and red velvet and black walnut galore, but is filled and covered with photographs, photographs, nothing but photographs. There may be waiting-rooms, full of frames and albums, and neat little dressing-rooms, "replete with every convenience," as a new hotel; but the spirit sinks and sinks till, when the gallery, dreadfully bare and business like, in cold blue and white, is reached, it touches bottom with a bump. I remember one reception room, very full one busy day, which was far more abominably desolate than any funeral I ever saw. The victims sat solemnly around the walls, every woman, of course, accompanied by two others nobly standing by their suffering sister in this crisis, occasionally giving her a little pat or pull till her turn came to appear. It was a sad hour.

It is unreasonable, and in a way a severe exposure of poor humanity's vanity and self-consciousness, this photographing state of mind. But it is undoubtedly vastly helped by the mechanical and strictly professional appointments of many galleries, and the semi-surgical manner of the operators.

Of course, a man, especially when a busy and nervous photographer, cannot always be the pink of smiling courtesy. It is well to bear in mind, nevertheless, that people expect to be idealized to a certain extent in the operations of photography, and a little of it before the lens does its work may save a great deal of it afterwards. Easy, unhurried motion, and a calm confidence that everything is going to come out all right, will impart themselves to the sitter, and a natural expression will replace the nervous flutter or the defiant glare, whichever his constitution may have led him to assume. If, in addition, there is a stock of good temper and untiring patience, we have the ideal photographer. Such a one studies the face in its different aspects in various lights, gets an idea of the best effects, and sure, then, of the material part of the picture, turns to the spiritual. Quietly talking, or simply waiting, he persuades the mind of the subject away from himself, until self-consciousness gradually disappears, the happy moment comes, a couple of seconds' pause, and it is done.

Not everyone can do this; but if one cannot change the furniture of his mind, he can that of his reception room. Galleries like those of Rose or Sarony may not be within his reach, but he can sink the shop a little, and make his rooms a pleasant place to be in. A well-chosen few of the innumerable fine reproductions, artistically framed and hung; a few jars, and screens, and mirrors, if he can go so far; anything to make the place less like a shop, and more like an abode of the arts. Let him suppress the photograph just a little, and endeavour to make the place artistic.

For the photographer, especially in the smaller towns, has a very considerable responsibility in that respect resting on him. He can do a great deal, if he will, in quietly educating the people in art. Let him get simply examples of the best photography, and of the reproductions that are now so inexpensive, and hang them, changing them when he can, in his rooms and windows. Let him take a few art journals, and try to read a few art books. It will advantage him, for he will be at the same time educating himself, and the results will be certain to show in his work; and let him coax his patrons on to the appreciation and demand for this—a demand he will be sure to find in time, for it is the peculiarity of the really good thing in art, as elsewhere, to stand wear, to endure and grow upon us. He will find himself forging ahead, and will learn that to be the artistic photographer of his community means not only to be the most skilful and intelligent but also the most appreciated and the best paid.—*Wilson's Photographic Magazine*.

PHOTOGRAPHIC CLUB.—Wednesday, Jan. 29th, annual lantern and musical entertainment. Subject for discussion Feb. 5th, "The Intensification and Reduction of Negatives."

DAGUERRE AND TALBOT.—At the Boston convention it was resolved to organise a one dollar subscription for the purpose of erecting somewhere in Washington a monument or memorial to Daguerre. We could have wished that in this matter the name of Talbot could have been associated with that of Daguerre; as, although each wrought independently of the other, their discoveries were given to the world almost simultaneously; and although for a time the beautiful Daguerreotype carried all before it, in something like a dozen of years it became little more than a memory, while the process of Talbot, in many modifications, no doubt, remains with us.—*The Beacon*.

SOAKING BEFORE DEVELOPING.—Photographers are sometimes advised to soak their plates in water before developing. Speaking from experience we certainly counsel them to do no such thing. This preliminary soaking has a tendency with most plates to make the high-lights flat and dull-looking, whilst it veils the shadows and half-tones in a most exasperating way. It is a great mistake also to imagine, as some photographers do, that a large quantity of developing solution in any way helps to produce a good negative. The finest negatives we have yet seen were developed with the smallest amount of solution that could be used; and we were assured by the artist by whom they were made that to this "kink" he attributed their best qualities. Try it.—*Wilson's Magazine*.

TABLE OF SIZES OF PRINTING AND WRITING PAPERS.

THE following useful tables of papers have been drawn up, with others, under the direction of Col. H. R. Thuillier, R.E., by Col. J. Waterhouse, assisted by Mr. W. H. Cole, M.A., and Mr. T. Archdale Pope, for the Survey of India Department:—

DESCRIPTION.	Broad-side.	Long Folio.	Long Thirds.	Long Fourths.	Broad Folio.	Broad Thirds.	Long Quarto.	Broad Quarto.	Long Octavo.	Common Octavo.	Long 12mo.	Common 12mo.	16mo.	32mo.
PRINTING PAPERS.														
Double Super Royal ...	41 ×27½	41 ×13¾	41 ×9⅙	41 ×6⅞	27½×20½	27½×13⅜	27½×10¼	20½×13¾	20½×6⅞	13¾×10¼	13¾×6⅜	13⅜ ×6⅞	10¼ ×6⅞	6⅞ × 5⅛
Do. Royal ...	40 ×25	40 ×12½	40 ×8⅓	40 ×6¼	25 ×20	25 ×13⅓	25 ×10	20 ×12½	20 ×6¼	12½×10	12½×6⅔	13⅓ ×6¼	10 ×6¼	6¼ × 5
Do. Demy ...	35 ×22½	35 ×11¼	35 ×7½	35 ×5⅝	22½×17½	22½×11⅔	22½× 8¾	17½×11¼	17½×5⅝	11¼× 8¾	11¼×5⅝	11⅔ ×5⅝	8¾ ×5⅝	5⅝ × 4⅜
Imperial	30 ×22	30 ×11	30 ×7⅓	30 ×5½	22 ×15	22 ×10	22 × 7½	15 ×11	15 ×5½	11 × 7½	11 ×5	10 ×5½	7½ ×5½	5½ × 3¾
Double Crown ...	30 ×20	30 ×10	30 ×6⅔	30 ×5	20 ×15	20 ×10	20 × 7½	15 ×10	15 ×5	10 × 7½	10 ×5	10 ×5	7½ ×5	5 × 3¾
Super Royal ...	28½×21½	28½×10¾	28½×7⅙	28½×5⅜	21½×14¼	21½× 9½	21½× 7⅛	14¼×10¾	14¼×5⅜	10¾× 7⅛	10¾×4¾	9½ ×5⅜	7⅛ ×5⅜	5⅜ × 3⅗
Double Foolscap ...	27 ×17	27 × 8½	27 ×5⅔	27 ×4¼	17 ×13½	17 × 9	17 × 6¾	13½× 8½	13½×4¼	8½× 6¾	8½×4½	9 ×4¼	6¾ ×4¼	4¼ × 3⅜
Royal	25 ×20	25 ×10	25 ×6⅔	25 ×5	20 ×12½	20 × 8⅓	20 × 6¼	12½×10	12½×5	10 × 6¼	10 ×4⅞	8⅓ ×5	6¼ ×5	5 × 3⅛
Medium	24 ×19	24 × 9½	24 ×6⅓	24 ×4¾	19 ×12	19 × 8	19 × 6	12 × 9½	12 ×4¾	9½× 6	9½×4	8 ×4¾	6 ×4¾	4¾ × 3
Demy	22¼×18	22¼× 9	22¼×6	22¼×4½	18 ×11⅛	18 × 7⅕	18 × 5⅗	11⅛× 9	11⅛×4½	9 × 5⅗	9 ×3⅔	7⅕×4½	5⅗×4½	4½ × 2⅘
Crown	20 ×15	20 × 7½	20 ×5	20 ×3¾	15 ×10	15 × 6⅔	15 × 5	10 × 7½	10 ×3¾	7½× 5	7½×3⅓	6⅔ ×3¾	5 ×3¾	3¾ × 2½
Foolscap	17 ×13½	17 × 6¾	17 ×4½	17 ×3⅜	13½×8½	13½× 5⅔	13½× 4¼	8½× 6¾	8½×3⅜	6¾× 4¼	6¾×2⅝	5⅔ ×3⅜	4¼ ×3⅜	3⅜ × 2⅛
WRITING PAPERS.														
Imperial	30 ×22	30 ×11	30 ×7⅓	30 ×5½	22 ×15	22 ×10	22 × 7½	15 ×11	15 ×5½	11 × 7½	11 ×5	10 ×5½	7½ ×5½	5½ × 3¾
Super Royal H. M. B. L...	27 ×19¼	27 × 9⅝	27 ×6⅘	27 ×4⅛	19¼×13½	19¼× 9	19¼× 6¾	13½× 9⅝	13½×4⅛	9⅝× 6¾	9⅝×4½	9 ×4⅛	6⅜ ×4⅛	4⅛× 3⅜
Royal H. M. B. L. ...	24¼×19½	24¼× 9¾	24¼×6½	24¼×4⅞	19½×12⅛	19½× 8⅛	19½× 6⅛	12⅛× 9¾	12⅛×4⅞	9¾× 6⅛	9¾×4¼	8⅛ ×4⅞	6⅛×4⅖	4⅞ × 3⅓
Do. H. M.	24 ×19½	24 × 9¾	24 ×6½	24 ×4⅞	19½×12	19½× 8	19½× 6	12 × 9¾	12 ×4⅞	9¾× 6	9¾×4	8 ×4⅞	6 ×4⅞	4⅞ × 3
Medium H. M. B. L. ...	22 ×17¼	22 × 8⅝	22 ×5¾	22 ×4⅜	17¼×11	17¼× 7⅛	17¼× 5½	11 × 8⅝	11 ×4⅜	8⅝× 5½	8⅝×3⅔	7⅛ ×4⅜	5½ ×4⅜	4⅜× 2¾
Do. M. M. B. L. ...	22½×17¾	22½× 8⅞	22½×5⅛	22½×4⅜	17¾×11¼	17¾× 7½	17¾× 5⅝	11¼× 8⅞	11¼×4⅜	8⅞× 5⅝	8⅞×3¾	7½ ×4⅜	5⅝ ×4⅜	4⅜× 2⅛
Demy H. M. B. L. ...	20 ×15¾	20 × 7⅞	20 ×5¼	20 ×3⅛	15¾×10	15¾× 6⅔	15¾× 5	10 × 7⅞	10 ×3⅛	7⅞× 5	7⅞×3⅓	6⅔ ×3⅛	5 ×3⅛	3⅛× 2½
Do. M. M. B. L. ...	20¼×15½	20¼× 7¾	20¼×5⅛	20¼×3⅛	15½×10⅛	15½× 6¾	15½× 5⅛	10⅛× 7¾	10⅛×3⅞	7¾× 5⅛	7¾×3⅜	6¾ ×3⅞	5⅛×3⅞	3⅞ × 2⅛
Double Foolscap M. M. ...	27 ×17	27 × 8½	27 ×5⅔	27 ×4¼	17 ×13½	17 × 9	17 × 6¾	13½× 8½	13½×4¼	8½× 6¾	8½×4½	9 ×4¼	6¾ ×4¼	4¼ × 3⅜
Foolscap H. M. B. L. ...	17 ×13½	17 × 6¾	17 ×4½	17 ×3⅜	13½× 8½	13½× 5⅔	13½× 4¼	8½× 6¾	8½×3⅜	6¾× 4¼	6¾×2⅝	5⅔ ×3⅜	4¼ ×3⅜	3⅜ × 2⅛
Do. M.M.	16½×13¼	16½× 6⅝	16½×4⅕	16½×3⅛	13¼× 8¼	13¼× 5½	13¼× 4⅛	8¼× 6⅝	8¼×3⅛	6⅝× 4⅛	6⅝×2⅜	5½ ×3⅛	4⅛ ×3⅛	3⅛× 2⅛

Notes.

Congresses, whether photographic or otherwise, have a disagreeable knack of not letting well alone. Some faddist has a pet idea which he trots out, and if no vital principle is involved, sometimes carries, very often to his own intense surprise. Something of this kind seems to have happened at the International Photographic Congress at Paris, where, at the discussion on "terminology," resolutions were carried which strike at the very basis of photography, as the public understand the term. Thus the first impression, whether on glass or any other material, whether negative or positive, is to be called the "phototype." The proofs from the "phototype" are to be designated the "photo-copies." The simple and familiar word "photograph" appears to have been extinguished.

The *Moniteur de la Photographie*, discussing the question, expresses dissent from the conclusions arrived at, and points out that in England the word "phototype" is already utilized for a particular process of reproduction. The word "photo-copy" pleases our contemporary even less, and it pertinently inquires if the want of the word has ever been felt. Have we ever desired to say, "Give me a photo-copy of your portrait?" or to exclaim, "Here is a beautiful photo-copy!" In speaking of a "photograph," everybody knows what is meant, and "photo-copy" is a confusing and an unnecessary innovation. Besides, to be consistent, other words would have to be revised. Why not "litho-copy" instead of lithograph, or "tele-copy" in the place of telegram? But we in England need not disturb ourselves over the matter. Congresses may come, and Congresses may go, but the word photograph is likely to go on for ever.

One of the oddest characteristics of photography is the facility with which men of equal ability and of equal manipulative skill, in trying the same process, arrive at totally opposite opinions. For the thousandth time, more or less, this was exemplified at the last meeting of the Photographic Society, when Mr. L. Warnerke was loud in his praises of the eikonogen developer, while Mr. S. G. B. Wollaston had not been able to succeed so far as obtaining density was concerned. It is puzzling why there should be these differences, but they bring with them their consolation, for if every photographer had exactly the same experience, where would be the necessity for photographic societies, and what would photographers find to talk about? This latter contingency, we are inclined to think, would be worse than the former.

The Russian authorities have placed a new tax upon travellers. New passport regulations came into force last week, and travellers will now be bound to carry their photographs annexed to their passes. It has been sarcastically suggested that ladies must be careful not to exhibit photographs taken ten years previously, while gentlemen must not be eccentric as to sudden changes in the hair on their faces. To save inconvenience, the *bureau* where the passport is granted should be provided with a photographic studio. This would prevent no end of trouble, as to be obliged to have your portrait taken (supposing you have not a photograph—no unlikely thing) just before starting on a journey would add a new terror to life.

But this is just what the authorities have not done; and the only consolation is, that the photographic profession in Russia will reap the benefit. But even here, what the Government have given with one hand they have taken away with the other; for after having created a trade by forcing people to be photographed, they proceed to lay a stamp duty of about 2d. on every carte-de-visite. Such at least is the expressed intention, and if so, photographers will not gain much, for though they may make more negatives, they will probably print less copies.

Illustrated journalism—if we may use the phase—is full of pitfalls. The journalistic artist is but mortal, and liable to err; but if he does make a mistake, and draws the wrong man, the consequences are far more awful than when a reporter puts words into the wrong man's mouth. The *Daily Graphic* last week had to apologise for a blunder of this kind at an illustrated report of a concert; but this was not so bad as a possible catastrophe in connection with another illustrated, averted only because the editor happened to know the originals. It happened over the blackmailing case, which has excited so much interest in the city. The case, though a criminal one, was heard at the Court of Queen's Bench, and the three defendants were not placed in a dock, but sat beside their solicitors. An artist who was sent to sketch the scene could, owing to the crush, only get admission to the public gallery, and therein made his notes. He was correct in spotting two of the defendants, but for the third drew the face of a highly respectable solicitor instead! Fortunately the editor, knowing the man, was able to put matters straight by cutting out the wrong one; but what would have happened had the block gone in? Surely a gross libel would have been committed!

One would almost think that Major Wissmann, the pioneer of German "colonization" in East Africa, had been to see Mr. Burnand's "Tra la la Tosca," and had taken a hint from the execution scene, which, as we described last week, consists of the prisoner being photographed. Major Wissmann—who, by the way, appears to be a military martinet of the school dear to the heart of Frederick the Great—subjected Bushiri to much the same torture as that gone through nightly at the New Royalty. After catching him, we read, Wissmann dressed him in rags and chains, and then in holiday clothes, and photographed him in each costume. He was to have been shot, but he behaved so treacherously that shooting was considered too good for him. The inference is clearly that by being photo-

graphed he was subjected to a punishment more ignominious than that which bullets would have inflicted! We hardly know whether photographers will feel pleased or annoyed at this.

Knowledge last week gave a full-page reproduction of a print from a pinhole negative taken by Professor Pickering. It represents the rear of the observatory of Harvard College, and though the sun was setting when the photograph was taken, the exposure was only six minutes. The photograph was taken from the roof of a cottage to the north-west of the observatory, and it is noticeable that the slates of the roof, the wires, and other objects in the immediate foreground, with the exception of the fir trees, which probably moved with the wind during the exposure, are equally as sharp as objects at a distance.

Mr. Bignell, the artist who has been selected to make the latest portrait of Mr. Gladstone, will not have a very easy task. Mr. Gladstone has sat so many times to painters and photographers that he is heartily sick of the operation, and has "struck." He flatly refuses to accommodate himself to a formal sitting, but has given Mr. Bignell permission to make himself at home in his library and catch the likeness the best he may, while Mr. Gladstone writes, or reads, or performs his many duties. After all, this is the best way of catching the true expression, but it makes great demands on the ability and quickness of the artist.

Gradually a photographic outfit is being recognised as a part of any traveller's outfit, whether he intends to write books or make pictures. Mr. W. H. Mallock, who has been rambling among Hungarian castles, will write an article on the subject in next month's *Scribner*, illustrated by photographs taken by himself. Mr. Herkomer is off to Cairo, where he will make sketches and take photographs for future use; while Sir John Millais has recently been on a journey, when his daughter acted as the photographer. The one man who, it would be thought, should have been among the earliest to practise the art, has not touched it—we mean the descriptive reporter. If the *Daily Graphic* succeeds—of which, by the way, we have doubts so long as it is conducted on its present lines—he may see the necessity.

Photography is the barometer of popularity. When anybody attains the rank of celebrity, the photographic print dealers are soon made aware of the fact. Major Serpa Pinto is the latest lion, not in England, but in Portugal, and the Lisbon dealers are worried to death because negatives of the intrepid and patriotic explorer, or marauding fillibuster, according whether you are Portugese or English, are scarce. Photographs are, indeed, at so high a price that an old trick, which used to be practised at Berlin in regard to the present Emperor's grandfather, has been imitated in Lisbon, and it is said that a person resembling Major Pinto has been hired to sit, in order to supply the needed negatives.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

FORMIC ALDEHYDE AND ITS COMPOUNDS—A NEW FLASH-LIGHT—THE PHOTONOM—QUINOL INTENSIFIER—COMBINED TONING AND FIXING BATH—HARDENING GELATINE PRINTS.

The Use of the Formic Aldehyde and its Compounds in Photography.—An invention has of late been patented by Mr. York Schwartz and Dr. Mercklin, of Hanover, consisting of the use of formic aldehyde and its compounds for photographic purposes. The sodium oxymethyl-sulphonate or formic aldehyde sodium bisulphite works well, especially with carbonated alkali; if added to the gelatino-bromide emulsion it accelerates the ripening, and imparts vigour and clearness to the negatives; also if added to the ferrous oxalate as well as to the pyrogallic and hydryquinone developers, it has a preservative action, accelerates development, and prevents fog. The keeping qualities of these developers are materially improved by the addition, and only about a quarter the usual quantity of iron is necessary to obtain equally good results. The sensitising action of the formic aldehyde and its compounds depends without doubt upon the energy with which they absorb bromine or iodine.

A New Flash-Light.—Professor Max Müller, in his excellent manual on the use of the magnesium light for photographic purposes, published a few weeks ago by Mr. K. Schwier, of Weimar, gives the formula of the flash-light composition with which he has obtained the beautiful cave pictures which were so much admired at the last Berlin exhibition. The original formula of Gaedicke and Miethe, who at first introduced the flash-light in its present form, contained, it will be remembered, crystallised trisulphide of antimony: 1 part of trisulphide of antimony, 3 parts of magnesium powder, 6 parts of potassium chlorate. The trisulphide of antimony, which has the function of accelerating the combustion of the composition, is a very dangerous mixture. For this reason Professor Müller replaces it by *perchlorate of potash*, which contains a larger quantity of oxygen than the potassium chlorate, and causes more rapid combustion without, he asserts, the production of a similarly dangerous explosive composition. His formula is the following: potassium chlorate 3 parts, perchlorate of potash 3 parts, magnesium powder 4 parts.

The Photonom.—This is the name of an ingenious new instrument constructed by one of our most eminent amateur photographers, Ritter von Staudenheim, of Fild-Kirchen, which was exhibited at the last meeting of the Photographic Society of Vienna. This instrument, forming part of the objective, has the function during the exposure of distributing automatically the light coming from the object into the lens, so that, in the case of landscapes, the sky receives a much shorter exposure than the foreground. The whole arrangement is fixed upon the lens tube, directly before the diaphragm slit, and it consists substantially of a shutter, which is moved by clockwork, and which can be regulated in its rapidity by means of retarding winged screws. The shutter moves downwards before the aperture of the lens, covering at first the sky, then the middle of the scene, and lastly the foreground. If, for instance, a plate is to be exposed in all for five seconds, then, by use of the "photonom," the sky, the air, and distant mountains may be exposed for only one second, the centre of the landscape for two seconds, and the foreground, in addition to the three seconds it has already re-

ecived, two seconds extra. The landscape photographs taken by means of this instrument are of excellent clearness, and show plenty of detail.

Quinol Intensifier for Collodion Negatives.—Prof. Eder publishes in the *Correspondenz* a formula for a hydroquinone intensifier which has been communicated to him by Captain Baron Hübl. This experimentalist endeavoured to find a trustworthy physical intensifying method for collodion negatives to replace the mercurial intensifier, and he succeeded by the use of quinol-silver intensification, which acts in the same manner as the well-known pyro-silver intensifier, possessing, however, the advantage that it not only intensifies the wet plate before being fixed, but that it perfects any imperfect details in the negative by continued development. Captain Hübl dissolves 10 grammes of hydroquinone in 1,000 c.c. of water, and adds so much of an acid that the solution, with one-third of silver nitrate solution, 1 : 30, remains clear for five minutes. The intensifier has been tried by Prof. Eder, and the results obtained were excellent. The formula used was the following :—

Solution No. 1.

Hydroquinone	10	grammes
Water	1,000	c.c.
Citric acid	6	grammes

Solution No. 2.

Silver nitrate	1	gramme
Water...	30	c.c.

Before use, 3 parts of solution No. 1 are mixed with 1 part of solution No. 2. The intensifier gives as excellent results in the reproduction of line drawings for photolithography as in the case of half-tone pictures for collotype. The wet collodion plates, after being developed with sulphate of iron, are rinsed and covered with the hydroquinone intensifier. When fixed, the negatives are, for the most part, vigorous enough, but, if necessary, they can afterwards be intensified also with mercury. If the negative has been nearly correctly exposed and well developed, the hydroquinone intensifier is employed after fixing ; the clear lines are thereby perfectly preserved.

Combined Toning and Fixing Bath.—Many toning baths have been recommended of late for prints on gelatino-chloride paper, but the following one, given by Herr Jos. Rud. Shauer in the *Phot. Nachrichten*, seems to be of special value, as it contains no alum, but instead thereof acetate of soda, which compensates for the decompositions otherwise taking place in the toning baths. The bath gives excellent tones of great variety. The following solution is made up at first :—

Solution No 1.

Distilled water...	1,000	c.c.
Hyposulphite of soda	250	grammes
Sulphocyanide of ammonium	30	,,
Acetate of soda (crystallised)	25	,,

To this is added a mixture of :—

Nitrate of silver	5	grammes
Chloride of sodium	8	,,
Water	20	c.c.

After this solution has stood for twenty-four hours, milky flakes of insoluble sodium compounds are produced in it, which are removed by filtering the liquid twice. Then the following solution is made up :—

Solution No. 2.

Distilled water...	100	c.c.
Chloride of gold (yellow crystals) ...	1	gramme
Chloride of ammonium	5	grammes

Solution No. 2 is poured into solution No. 1, not *vice versa*, otherwise the bath would be destroyed by the formation of dark brown sulphocyanide of gold. After a thorough shaking and settling, the bath is ready for use. If it is preferred to tone the prints, more Vandyke brown or umbra, also five grammes of pure carbonate of ammonium, should be added to the bath. A bath made up in the described manner, which has been in use for ten months, works still as if entirely unaltered. The procedure is as follows :—Of the above 1,000 volumes, 100 volumes are poured off into a bottle for daily use. The small quantity which is eliminated by toning is always replaced from the stock solution. Should the bath, by toning one hundred cabinets or more, become dark brown, it does not matter ; the precipitate is removed from the prints by means of a soft brush in the washing water, and the bath is filtered several times. Care should be taken that the temperature of the bath is not below 68 to 71° F.

Hardening Gelatine Prints.—The same experimentalist gives a good formula for hardening or tanning gelatine prints. The following solution is made up :—

Distilled water...	1,000	c.c.
Tannin...	1	gramme
Chloride of sodium	10	grammes
Saturated solution of potassium aluminium sulphate	100	c.c.

The prints, if pressed between blotting paper, never stick together, and if squeegeed on to glass plates rubbed with talc, and dried at a temperature of 77° to 86° F., come off after half an hour with an indestructible high gloss. If they have been touched with wet or greasy fingers, it is only necessary to rub them with a dry rag to remove every trace of uncleanness. The whites remain absolutely pure, and prints treated in this manner can easily be retouched without the retouching being perceptible.

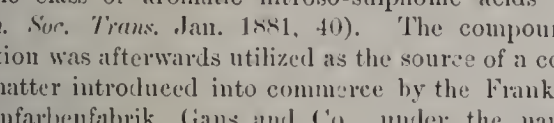
MR. W. DARNELL, writing to the *English Mechanic* about aerial photography, says :—"Being an aeronaut and photographer, I have had the opportunity of exposing a few plates, but have not got them as sharp as I should like. To get good results it requires one to look after the camera, and one to bring the balloon down to the altitude required. In the PHOTOGRAPHIC NEWS there were two plates published on April 2nd, 1886, views of Paris taken from a balloon, which I have by me."

MIRAGES.—The article in *Nature* of November 21st, 1889 (p. 69), recalls to me mirages I saw in March, 1888, while travelling in the East on the steam yacht *Ceylon*. On the 29th we were crossing the Black Sea from Sebastopol. It was a fine, cool day, and quite calm. In the afternoon a false or mirage horizon about 3° above the true one was visible for a few hours. No objects were within range of vision. The mirage disappeared as the sun declined. The next day was very much warmer, and we saw a more marked and interesting mirage in the afternoon as we were steaming across the Sea of Marmora away from Constantinople. In this case it appeared only in the west, and objects were seen reflected in an inverted position. A small conical-shaped island was seen with its inverted image at times distinct from and at times blending with the original. The image was distinctly seen of some land, which was actually below the horizon. The mirage of the reflection of the sun in the sea was, when seen through a glass, especially beautiful. It resembled a glorious cataract of golden water. This mirage lasted till quite the dusk of the evening, and then gradually thinned down and died away. I do not know whether mirages at sea are uncommon ; but as the officers on board did not remember seeing one before, I thought these instances might be worth recording.—ARTHUR E. BROWN, *Thought Cot, Brentwood, December 31st*, 1889.

EIKONOGEN.*

BY RAPHAEL MELDOLA, F.R.S.

IN 1880, when studying the action of nitroso-compounds on phenols, I discovered a nitroso-sulphonic acid of β-naphthol, which at that time was the first known representative of the class of aromatic nitroso-sulphonic acids (*Jour. Chem. Soc. Trans.* Jan. 1881, 40). The compound in question was afterwards utilized as the source of a colouring matter introduced into commerce by the Frankfurter Anilinfarbenfabrik, Gans and Co., under the name of "Naphthol green B." (Ger. Pat. 28,065. January 19th, 1884.) This compound, which was briefly described by Otto Hoffmann (Ber. 1885, 46) is the sodium ferrous salt of the β-naphthol-nitroso-sulphonic acid referred to, and may have the formula—



$$\left(fe = \frac{Fe}{2}\right)$$

according to the view taken with respect to the presence of a nitroso-group or an isonitroso-group in the compound. The colouring matter is of considerable technical value at the present time, and is of interest as being the only known artificial colouring matter which contains iron as an essential constituent, excepting, of course, the well-known iron-cyanogen compounds.

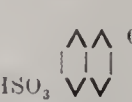
Theory indicates the existence of seven isomeric monosulphonic acids of β-naphthol, of which only four are known at the present time. Only one of these is concerned in the present communication—viz., that modification first discovered in 1869 by Schaeffer, and which is best prepared by heating β-naphthol with twice its weight of strong sulphuric acid to the temperature of boiling water till the naphthol is completely sulphonated. One, if not two other, monosulphonic acids are produced at the same time, together with a certain quantity of isomeric disulphonic acids, but the chief product under the conditions specified is Schaeffer's monosulphonic acid. It is the latter acid, which on a small scale can best be isolated in the form of its ammonium salt, which gives the nitroso-acid under consideration. In order to prepare the latter it is only necessary to dissolve a given weight of the ammonium or other salt of Schaeffer's acid in cold water together with the necessary quantity of sodium nitrite, and then, keeping the solution well cooled, gradually add hydrochloric acid to acid reaction. The nitrosulphonic acid is at once formed and remains in the solution, imparting to the latter an orange colour. The acid can, if necessary, be isolated in a state of purity as a barium or calcium salt (*Jour. Chem. Soc. Trans.* 1881, 44).

By the reduction of the nitrososulphonic acid an amido-sulphonic acid was prepared, which was isolated and analysed and described in the paper referred to (*loc. cit.*, 47). This acid was the first amidosulphonic acid of naphthol ever obtained, and it is the sodium salt of the said acid which has recently been introduced as a photographic developer under the name of "Eikonogen." As the discoverer of the acid I have been urged to give this note upon its chemical history for the use of English chemists, and in doing so, I think it only fair to add that although the easily oxidisable character of the acid and its salts naturally suggested trying it as a photographic developer, I was not at the time engaged in photographic work, and the idea was never carried out till the substance was actually introduced into commerce for this purpose.

Of the advantages of eikonogen as a developer I do not propose to say anything on the present occasion, since its qualities have been thoroughly tested by photographers, and it is becoming very popular for many reasons, which will be found in the papers dealing with its application. (See, for instance, papers by Professor G. D. Liveing, PHOTOGRAPHIC NEWS, September 20th, 1889; John Spiller, in the recently-published YEAR-BOOK OF PHOTOGRAPHY (1890, 124); also Lyonel Clark and H. M. Elder in the PHOTOGRAPHIC NEWS of December 13th, 1889). Some months after the publication of my paper Griess obtained an amido-β-naphtholmonosulphonic acid, which was no doubt identical with the one described by me (Ber. 1881, 2041). He obtained it by reducing the azo-compound formed by the action of metadiazobenzoic acid on Shaeffer's acid. The whole subject has since been thoroughly investigated by O. N. Witt (Ber. 1888, 3468 and 3489), who has not only confirmed and extended my original observations, but has also obtained the three other amidosulphonic acids corresponding to the three β-naphtholmonosulphonic acids made known since the time of my investigations. Witt's amido-sulphonic acids were all prepared by the reduction of azo-derivatives of the respective β-naphthol-monosulphonic acids by means of stannous chloride. There are thus known at the present time:—

1. Amido-β-naphthol-β-sulphonic acid, from Schaeffer's acid.
2. Amido-β-naphthol-α-sulphonic acid, from Bayer's (Crocic) acid.
3. Amido-β-naphthol-δ-sulphonic-sulphonic acid, from Casella's F-sulpho acid.
4. Amido-β-naphthol-γ-sulphonic acid, from Dahl's acid.

Of these four acids the first appears to be the most readily oxidisable, and therefore the most suitable for photographic development. It is possible that some specimens of eikonogen may contain the acids (2), (3) or (4), but I have not yet met with a preparation in which these isomerides could be detected. With respect to the constitution of eikonogen, I am glad of the present opportunity of being able to correct my earlier statement, because more exact information has been obtained by numerous workers during the nine years which have elapsed since my own investigation. The constitution of the amido-sulphonic acid is, in the first place, dependent upon the constitution of Schaeffer's acid, which was practically unknown in 1881. It was not even known with certainty whether the hydroxyl and sulpho-groups were in the same or in different rings. It has now been shown that this acid is a heteronucleal derivative, and the most probable formula is—

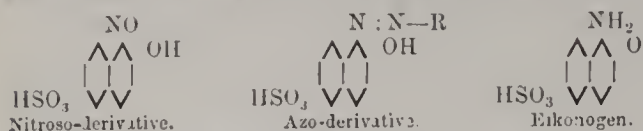


It is true that by the oxidation of my amido-β-naphthol-sulphonic acid I obtained phthalic acid, and this led me to the conclusion that Schaeffer's acid was a homonucleal compound. There is now no doubt, however, that the product of oxidation is β-sulphophthalic acid (Remsen and Comstock, *Amer. Chem. Journ.* V., p. 106; Rée, Inaug. Diss. Bern, 1886), and that the phthalic acid obtained by me from the amido-sulphonic acid was the result of the hydrolysis of this sulphophthalic acid.

It is well known that in compounds which furnish both

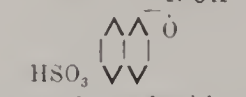
* From the *Journal of the Society of Chemical Industry*, December 31st, 1889. No. 12, vol. viii.

azo-and nitroso (isonitroso) derivatives the azo-group and the nitroso (isonitroso) group occupy the same position in the aromatic ring. In Schaeffer's acid the most readily replaceable hydrogen atom is undoubtedly the α-(ortho)-atom with reference to the hydroxyl, so that the constitution of these derivatives and of eikonogen is as follows :—



Nitroso-derivative. Azo-derivative. Eikonogen.

If the first of these compounds be regarded as an isonitroso-compound its formula will be :—



Eikonogen may thus be made either by the reduction of the nitrososulphonic acid or of an azo-derivative of Schaeffer's acid. By the action of diazobenzene chloride upon this last acid an orange colouring matter is obtained, which is met with in the market under the names of "Crocein Orange," "Brilliant Orange," "Ponceau 4 G.B." &c. It is one of the oldest known azo-colours, having been described by Griess in 1878 (Ber. 1878, 2197.) This compound may be used as a source of eikonogen, using stannous chloride as a reducing agent:—

$$C_6H_5.N_2.C_{10}H_5.HSO_3.OH + 2\,SnCl_2 + 4\,HCl = C_6H_5.NH_2 + 2\,SnCl_4 + C_{10}H_5.HSO_3.OH.NH_2$$

It would seem more economical, however, for manufacturing purposes to revert to the original method and reduce the nitroso-β-naphtholsulphonic acid, which need not even be isolated for this purpose, but can be formed by the action of nitrous acid in the manner previously described, and reduced in the same solution. The use of aniline can thus be dispensed with, and tin replaced by a cheaper reducing agent, such as zinc dust. The raw material is, moreover, practically a waste product, since the azo-colours obtained from Schaeffer's acid are of but little value compared with those obtained from the other monosulphonic acids of β-naphthol, and it is the manufacture of some of the latter that Schaeffer's acid is obtained as a by-product. Owing to the readily oxidisable character of the salts of eikonogen, it is necessary, after the free acid has been obtained, to convert the latter into the sodium or potassium salt in the presence of excess of sulphite.

To the numerous coal tar products which have given to chemical industry such a wealth of technically valuable compounds, we can now add this new photographic developer, which threatens to drive the older and related compounds—pyrogallol and hydroquinone—altogether out of the field.

FOR restoring old papier machè trays a German photographer recommends a double coating of asphaltum, followed by a coat of a solution of 1 part of shellac in 5 parts of alcohol.

TEMPERATURE IN DEVELOPMENT.—Alfred Stuglitz notes in the *Photo. Rundschau* the extreme influence of temperature on developers. He states that a developer used too cold is certain to give hard negatives, while one too warm will give them quick and weak. He recommends a standard temperature at which the developer is to be kept all the year round, about 60° F.; and considers that 10° either way make considerable difference in the action. More especially is this so in the leisurely development which is always advisable when finely graduated soft half-tones are desired in the plate; with very rapidly-working development the effects of temperature are not so noticeable.

Notices of Books.

OUR HOME IN AVEYRON. By C. Christopher Davies and Mrs. Bronghall. (*Blackwood & Sons, London:* 1890.)

THIS book consists of studies of peasant life and customs in Aveyron and The Lot, far down in the south of France, and is illustrated with copies of photographs taken by Mr. Davies. He says that in giving lectures and exhibiting lantern pictures to rural audiences in England, he found that much more interest was exhibited in the simple details of home life, which might easily be compared with one's own modest experiences, than in more ambitious tales of travel. This is true, and were more lantern-slide pictures devoted to illustrating the manners and customs of other nations than ours, and fewer devoted to mountain scenery and large public buildings, their interest to the general public would be increased. The book before us does not exactly carry out its programme so far as the illustrations are concerned; they number but a dozen altogether, and several of these are not pictures representing the manners and customs of the people. What, in this respect, is lacking in the pictures—which, however, are interesting so far as they go—is made up in the letter-press, wherein will be found minute details about life and manners in a French mining village, furnished by permanent English residents, who consequently were well acquainted with the subject in hand. One of the best illustrations in the book represents a religious procession, with the villagers ambling along, and throwing out their legs, with their hands in their pockets, all resulting in a realistic effect such as photography alone would be likely to give, for few painters could or would have grouped their models in such natural and ungainly attitudes.

The out-of-the-way district described by the authors is known as the "Lost Country," the difficulty of access to and egress from it having given it, say the authors, the name of the "Pays Perdu" among distraction-loving Frenchmen. "What will you?" they say; "There is nothing, literally nothing, wherewith to amuse one's self. It is a lost country." On a remark being made to a peasant woman, "This is a beautiful country of yours," she replied, "Oui, mademoiselle, mais il est un peu perdu."

In the schoolroom of the village schoolmaster, who was the mayor's secretary, Mr. Davies one night gave a lantern entertainment to a crowded house. "Never," he says, "was such a thing heard of in that out-of-the-way village before. One woman asked another if a *lantern magique* was like a Chinese lantern. The younger people, like most young people at a half-dark entertainment, indulged in a little flirtation, thus giving the pictures an added charm; while as for the children, they gazed with open-mouthed wonder upon the enchanted sheet where the views and figures appeared and disappeared. When the news got abroad that Monsieur le Directeur (of the local mines) had come, and the entertainment was about to commence, in came the people, like the rats in the castle on the Rhine; they came in at the windows and in at the doors, till the place was literally crammed. The front row knelt, the second stood, the third climbed on the desks, and the rest stood on the window-sills or on the shoulders of those willing to bear the weight.

"The long man of the village bore a friend on his shoulders, and this friend bore another friend. Then these three got unsteady and toppled, in their descent upsetting the belle of the village, who gave the long man a

box on the ear by way of recompense. The audience were delighted with the views shown them of Paris and Switzerland; but when a transparency of their village street, showing a group of familiar figures, was thrown upon the screen, they were uproarious. We finished up with a photograph of the director, under which was written *Bonne nuit*, after which the schoolmaster thanked us for the entertainment, and the people dispersed, thoroughly pleased with their evening's amusement. One poor old woman asked if there would be a collection, and when told No, expressed her astonishment that any one should take so much trouble simply to give pleasure to others. Poor people! they are so money-grubbing themselves, and so used to see those above them money-grubbing also, that they cannot understand that we should wish to give them pleasure and charge nothing for it."

The farmers in France are for the most part proprietors of the land they cultivate, and they turn out vast quantities of dairy produce for sale in England, to the great financial benefit of our Gallic neighbours. Mr. Davies and some of his English friends were one day invited to lunch by a wealthy peasant proprietor, M. Pantillac, an unshaven little man, in a blue blouse and a shabby felt hat. As in those parts flower-pots with a big hole in are fixed in front of the houses, and the birds of the air confidingly build their nests therein, and the young birds are collected and cooked by villagers, an invited guest fresh from England expected stewed nestlings and dandelions on the occasion. "On the contrary," said a friend, "you will get a meal of twenty courses, and most excellent wines. . . . He wants me to buy a bit of his land, so he will give us a grand feast." "That isn't very flattering to us; I would rather think he means to be hospitable." "Ah! that is not the virtue of a French peasant."

France is a great country, and what is true of one portion may not be true of another, just as a description of Yorkshire peasantry would not be applicable to those of Scotland. The description the authors give of the main streets of some of the villages being also the main sewers, all open to sun and air, is not applicable to all parts of France. In the rural districts of that nation will be found many homely, hospitable, genuine people.

The authors of the book are Protestants, as they often inform the readers, and they have much to say about Protestants and Catholics. Some years ago a Government Inspector asked the children at the convent school at Bouillac, "What are Protestants?" and was told that they were black people with tails, and, being little better than the devil, were all damned. At his last visit the children were indignant; they said that they had discovered that the English Protestants then living in the village had no tails, were not black, but were very nice people indeed.

Altogether, the book is an interesting one to photographers and to the general reader. It gives information about the inner life, and customs, and thoughts of villagers in some of the provinces of France, such as could only be given fully by permanent residents in their midst, and not by casual visitors. Hence the photographic tourist, who reads it before starting on his travels in France, can gain a store of useful information, remembering always that portions of it are true only in relation to the particular provinces described by the authors.

RUST spots on lenses may be readily removed by placing the spots in contact with chlorhydric acid diluted with a little water.—*La Nature.*

THE LATE CUTHBERT BEDE AND HIS BOOK "PHOTOGRAPHIC PLEASURES."*

BY W. LANG, JNR., F.C.S.

I THINK we may safely take it for granted that all of us have read "The Adventures of Verdant Green, Freshman at Oxford." Published more than thirty years ago, it still enjoys a world-wide popularity. It is not, however, so generally known that the same author has a work which appeals more especially to us who are interested in photographic matters. The title of this work is "Photographic Pleasures," popularly portrayed with pen and pencil, and I purpose showing you, through the medium of the lantern, some of the more interesting sketches which are to be found in the volume. Before proceeding to do so, however, a few details regarding the author may perhaps be appropriately given. In the first place, we will have thrown on the screen the portrait of Cuthbert Bede, which appears as frontispiece to the volume of "Verdant Green" which I have in my possession, and then we will have the picture which appeared in the *Illustrated London News* of December 28th, 1889. The original is a Meisenbach photo-block from a photograph taken by Messrs. Hill and Saunders, of Cambridge. It is almost superfluous to state the fact that Cuthbert Bede is only a *nom de plume*, our author's real name being Edward Bradley, or, rather, the Rev. Edward Bradley. At the time of his death, which took place on the 12th of December last, he was vicar of Lenton, a village near Grantham. Although his famous work depicts student life at Oxford, he was not himself an Oxford graduate. He received his education at Durham University, where he took his degree. He was ordained in 1850, and was successively incumbent of Bobbington, in Staffordshire (1857), rector of Denton, Hunts (1859), rector of Stretton, near Oakham (1871), and finally he was presented in 1883 to the vicarage of Lenton. "Verdant Green" was published in 1854, and "Photographic Pleasures" in 1855. The following are his other works, with year of publication:—"Nearer and Dearer" (1857); "Fairy Fables and Happy Hours" (1858); "Glenereggan" (1860), this being a record of a visit paid to Kintyre; "Curate of Cranston" (1862); "Tour in Tartan Land" (1863); "The White Wife" (1864); "The Rook's Garden" (1865); "Matins and Muttons" (1866); "Fortheringay and Mary Queen of Scots" (1866); "Little Mr. Bouncer," a sequel to "Verdant Green" (1878). He contributed, also, articles to *Punch* and to the *Graphic*. The above list will show that he was a prolific author, and he not only could write with his pen, but he could draw with his pencil. The illustrations accompanying the letterpress were invariably his own. You will be better able to judge of his success in this direction when you see some of the pictures from his "Photographic Pleasures." Here is the title-page. He dedicates the book, "To all the light-hearted friends of light painting these pages of light literature are with no light regard dedicated."

The book is divided into twelve chapters:—

CHAP.

I. "Photography regarded as a Light Subject."
II. "Photography in a Legendary Light."
III. "Photography in a High Art Light."
IV. "Photography in an Artistic Light."
V. "Photography in a Portrait Painting Light."
VI. "Photography in a Love Light."
VII. "Photography in an Amateur Light."

* A Communication to the Glasgow Photographic Society.

CHAP.
VIII. "Photography in an Aristocratic Light."
IX. "Photography in a Negative Light."
X. "Photography in a Positive Light."
XI. "Photography in a Detective Light."
XII. "Photography in All Manner of Lights."

The illustrations are twenty-four in number, all of them full-page. The picture which forms the frontispiece has for its title, "Portrait of a distinguished photographer who has just succeeded in focussing a view to his entire satisfaction." The first illustration in the body of the book shows a possible contingency which might happen to the unhappy possessor of a photographic tent: the letter-press underneath is as follows:—"An enthusiastic photographer tries a tent of his own invention. He is disagreeeably interrupted in the pursuit of science by the entry of a wild Irishman, who forthwith is carried back in imagination to the pleasures of Donnybrook Fair, and is unable to resist the temptation that the tented head presents." The next illustration represents "A mediæval photographer, from an illumination in the (Gun) Cotton MSS.," and "Monsieur Daguerre introducing his pet to Mr. Bull, with the remark, 'My Sun, sir.'" Both pictures are intensely funny. The toy camera on wheels which the son draws after him is a fine touch of humour.

I may just refer to one or two of the more outrageous jokes in the chapter, "Photography in a Legendary Light." You have had from myself lately a little of the history regarded seriously: we will see what Cuthbert Bede has to say on the matter from his point of view, which we may safely call the comic side of the question:—"Porta was the gate that indirectly led to photography. It was in the sunny land of Italy that a philosopher, Baptista Porta by name—a Porta who thought no small beer of himself—invented the camera. He inhabited an apartment to which (owing, probably, to the oppressive nature of the window tax) the light was admitted through a small aperture. The whole of the discovery was owing to the hole, for, as it was of a lenticular shape, the ray of light that passed through it painted upon the wall, in cheapest of frescoes, pictures of all that was going on on the outside. The philosopher saw the ray, cried 'Hurrah!' and constructed the camera, that Pandora's box in which photography lay concealed." Speaking of Sir Humphry Davy's attempts, he says, "His plates were like the hearts of flirts, the images impressed on them were but faint, and could not be fixed." Our author is a little mixed when he says, "Daguerre's pictures were fixed on paper impregnated with nitrate of silver; those of M. Niépcè were upon glass, silver-plated copper, and polished tin." But let that pass. He gives Daguerre a side thrust when he says the Frenchman delayed the execution of the official document, viz., the giving over the process to the French nation, until a patent had been secured for an agent in England, "thus being guilty of a deception patent to all." The dispute between Talbot and the Rev. J. B. Reade, as to the use of gallic acid as a developer is thus disposed of:—"The Rev. J. B. Reade addressed to the London Institution an account of a method for obtaining light pictures by a process in which infusion of galls was employed. This led to the infusion of no small amount of gall in a correspondence which took place on the subject between Mr. Reade and Mr. Talbot, the latter having, in an affidavit, denied Mr. Reade's title to the invention he claimed; the moral of all this being that Mr. Talbot had leant upon a reed until it pierced him." Referring to Scott Archer, we are told he "shot himself into the temple of fame by the use of guncotton."

The next illustration in order, entitled "Photographic Tableaux," embodies two pictures. "The Infant Photography Strangling the Serpents," these being Daguerre's and Talbot's patents, and "Photography between Love and Vanity." This is followed by a full-page picture, a simple mode of "levelling" a camera. The picture speaks for itself. The seventh illustration comprises three subjects, and are as follows:—"The Fixing Process," where a bull is seen chasing a somewhat obese individual who has arrived at the wicket gate of the field only to find that he cannot get through; "An Exciting Process" is represented by a man being pushed overboard from a ship only to fall among the sharks who are expectantly waiting for him; "The Sensitive Process" depicts a pair of lovers in the conventional attitude, with the motto, "He to lips that fondly falter presses his without reproof."

(*To be continued*).

THE DAGUERRE MONUMENT AT WASHINGTON.

MR. H. MCMICHAEL writes, on behalf of the Daguerre Memorial Committee:—The memorial will be placed in the Smithsonian Institution at Washington, at the opening of the next convention, which will be held in that city some time next summer. A report will be made at the next convention of the amount raised by each house, and the name of each person who subscribes one dollar will be deposited within the monument.

The Committee, composed of the Executive Board of the Photographic Association of America for 1889, have spent six or eight weeks in correspondence with different artists, with reference to style and price of such a memorial, and have come to the conclusion that the sketches submitted by the celebrated sculptor, J. Scott Hartley, of New York, are the most satisfactory. Mr. Hartley sends four sketches, ranging in price from twenty-five hundred to six thousand dollars.

Nos. 1 and 2 will cost twenty-five hundred dollars each. These designs contemplate pedestals three feet six inches high; No. 1 to be of richly carved oak, and No. 2 of granite with bronze bas-relief; a design of oak or laurel framing the relief on a wood pedestal, shows Daguerre experimenting with the camera. Both pedestals are to be surmounted by a bust of Daguerre in bronze or marble.

No. 3 can be executed for three thousand dollars, and consists of a globe and rough unhewn base in granite; globe polished and map incised and encircled with laurel wreath in bronze and mounted with a cast-bronze bust of Daguerre, the whole to stand five feet high.

No. 4 contemplates something more elaborate, and consists of a pedestal or base in unpolished granite, the name of Daguerre in polished letters. This base is mounted by a globe of polished granite, map incised, with wreath of laurel, medallion portrait of Daguerre and life-size figure of Fame in standard bronze.

The design represents Fame taking the laurel, which encircles the earth, and placing it about Daguerre as a framework. The whole is to stand nine feet high, and would certainly present many unusual art possibilities. There would be little profit to the artist at six thousand dollars, for which he agrees to erect it.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical meeting, Tuesday, January 28th, at 8 p.m., at the Gallery, 5A, Pall Mall East.

Patent Intelligence.

Applications for Letters Patent.

602. E. JUSTICE, 157, High Holborn, London, "Stretchers and Frames for Pictures."—January 13th.

611. W. C. HUGHES, 4, Little Moorfields, London, "Magic Lanterns."—January 13th.

669. E. G. BALLARD, 6, Lord Street, Liverpool, "Ascertaining the requisite Time of Exposure in Photography."—Jan. 14th.

742. A. CLARK, 5, Richmond Road, Basingstoke. "Bindings for Photographs."—January 15th.

763. WILLIAM FRIESE GREENE, 321, High Holborn, London, "Obtaining Photographic Representations."—January 15th.

782. C. CLARK, 18, Buckingham Street, Strand, London. "Lifting Thimble for Photographic Use."—January 15th.

Specifications Published.

1365.—*January 25th*, 1889. "Lamp for Photographic Work." WILLIAM JAMES LANCASTER, trading as J. Lancaster and Son, of Colmore Row, Birmingham, Manufacturing Optician.

This invention relates to an improved construction and arrangement of lamps, principally for photographic work, although the same may be employed for other purposes.

The said invention consists 1st, in a double reflector, viz., a primary inside reflector, and a secondary outside one. 2nd, In a means of retaining or holding the said secondary reflector in an adjusted position. 3rd. In double folding panes of ruby light, which open outwardly, and fold inwardly upon each other.

In making a lamp according to my invention, I mount a pyramidal shaped body part upon a base or pierced support, and with the said body part surmounted by a perforated lantern or cowl, through the piercings of which the products of combustion of the lamp outwardly pass.

The open front of the lantern is enclosed by two ruby panes or lights, respectively of about the area of the said open front, and are so arranged that when in use they fold and lie flat light-tight, one upon another.

Thus, the No. 1 ruby light is hinged close to one side of the open front, and folds flat to its boundary edging, whilst the other or secondary ruby light is hinged crank like to the other side of the said open front, and is arranged to fold over upon, and flat to the No. 1 light aforesaid.

To near the top of the open front, the combined reflector and lid is jointed, and moves vertically and flap like over the ruby lights as aforesaid; so that light radiating from the lamp falls upon the reflector, which depends at an angle, and is from thence reflected downwards upon an object as may be required. This overhanging reflector is provided with a stiff joint, so that it may rest when adjusted at any angle.

The affixing after adjustment of the secondary reflector may be accomplished by a forked or slotted arm, directed from the top of it, and embracing the stem of a headed screw which, when turned home, clamps the arm in the said reflector's adjusted position.

The secondary reflector also prevents the rays of light from passing upwards into the operator's eyes in developing or manipulating a photographic negative.

The purpose of the double ruby panes is that an operator can decrease or intensify the ruby light at pleasure.

The primary reflector is mounted upon and at the back of the oil tank or reservoir, which is preferably placed in position by a sliding movement; that the removal of the tank and burner, carried by it, takes away with them the said reflector.

The wick winder axis is connected to the outside by a detachable clutch arrangement, consisting of an outside milled head, whose neck passes inwardly to a clutch or fork, wherein a crutch end of the said winder axis passes when the tank is in position.

Thus, when the tank is removed, the crutch end of the winder axis is taken from the fork or clutch of the turn, and when the tank is placed in position the winder axis and turn are as one, and rotate together.

The back of the lamp is preferably made to slope pyramidally more than the sides, and upon which said back a handles or handles is or are secured.

It may be further observed that the lid encloses the front when closed upon it, and that the primary reflector may be made detachable from the lamp or from the tank, so as to admit of being readily cleaned.

The inventor claims—

1.—Providing or enclosing the open fronts of lamps for photographic work, with two or more ruby and orange coloured panes or lights, which admit of being used independently or collectively for the purpose.

2.—Making the hinged sides of the carrying frames of ruby or orange lights, referred to in the preceding claim, stand away flange or crank like from the sides of lamp, to which they are hinged, so as to admit of the said lights folding upon each other when closed, and opening out, free of the open front of the lamp, or of the frame or frames of the inner light or lights.

3.—Providing lamps employed in photographic work, as described, with a screen reflector, jointed to the top of the lamp, and adapted to be employed as a reflector and screen when open, and as a lid for enclosing the front of the lamp and cognate parts of it when closed.

4.—Affixing the combined screen reflector and lid in a screening and reflecting position, by means of a jointed and slotted arm and clamping screw.

5.—Providing the interior or back inside of the lamp with an upright parabolic reflector, or an upright reflector of the figure of a parabola, in cross section.

6.—Providing lamps as described, with open bottoms, or bottoms partially enclosed by the oil tank, and a platform partition, whereby air for promoting combustion is admitted, and light from the lamp intercepted.

7.—Operating the wick winder spindle from without by a clutch or connection.

8.—The construction and arrangement of the parts of lamps for photographic and other work.

18,444.—*19th November*, 1889. "Appliances for Ascertaining Distances." HENRY SAMUEL SPILLER WATKIN, of the Wilderness, Woolwich, Kent, Major Royal Artillery.

The instrument and appliance consist of three parts:—

a. An optical square fitted with a telescope and hinged flap.

b. A telemeter by which the distances are read off on a drum.

c. A peculiarly constructed cord which forms a base, at the ends of which the instruments are worked.

After describing the apparatus, with engravings, the inventor says: "To obtain ranges of moving objects, all that is required is for the observer with the optical square to constantly obtain coincidence by swaying his body and shifting his position. In this manner the ranges of artillery, cavalry, and infantry in motion have been taken; five or six ranges per minute being obtained, to an accuracy of one per cent."

The inventor claims:—

1. The peculiar arrangement of screw and drum.

2. The arrangement whereby the said screw is applied to form a telemeter.

3. The construction of cord for use with the telemeter.

QUICK WORK.—An unprecedented experiment in photography was tried at the entertainment of the Lynn Camera Club, whereby the audience was shown to itself. During the first part of the meeting, Mr. G. D. Milburn, of Rochester, took a flash-light picture of the audience from the platform. During the entertainment he developed the negative, made a lantern slide, and, while the speaker, Mr. Walter G. Chase, was describing some instantaneous pictures the view of the audience was suddenly thrown on the screen without previous notification. The effect upon the individual members of the audience, as each one recognized himself or herself—for every face was distinct—was somewhat startling. The flash-light exposure, development of negative, and the exposure and development of the lantern slide, including washing of both negative and slide, consumed less than one hour."—*Wilson's Magazine*.

Correspondence.

ORTHOCHROMATIC PHOTOGRAPHY.

SIR,—Mr. B. J. Edwards's proposition that but for the patent law, "colour-sensitive photography would now be numbered among the lost or forgotten processes of the art," appears to me to be not only so baseless, but in such direct opposition to the facts, that I think it should not be allowed to pass unchallenged.

Mr. Edwards complains of M. Vidal for ignoring Tailfer, whilst his own proposition ignores the labours of Waterhouse, Vogel, Ives, Obernetter, Abney, and others; labours which have established colour-sensitive photography. Not only is this so, but it is the work of one of these inventors that has put it within the possibility of a patentee, M. Tailfer, to endeavour to monopolise one of the principal processes.

In another letter, Mr. Edwards has spoken of the "eosinated silver bromide process patented by Tailfer," an expression that might lead to the inference that eosinated silver bromide itself is claimed in the patent, which, however, is strictly limited to the use of ammonia with eosine, eosine as a colour-sensitiser having been some time before discovered by Waterhouse.

Any who may desire to practise orthochromatic photography, and do not wish in their own persons to defend public rights at the risk of threats, at all events, of legal proceedings, may remember that, according to several experimentalists, eosine and erythrosine may be used with effect without ammonia, whilst chlorophyll, cyanine, chinoline, and azaline, and other sensitisers, are substances that not even the most partisan scientific witness can be found to class as eosines.

W. E. DEBENHAM.

SIR,—Mr. B. J. Edwards has, perhaps, not exactly caught the sense of my observations relative to his presentation to the French Photographic Society. I by no means intended to criticise the nature of the results obtained upon his orthochromatic plates; I merely said that amongst the proofs submitted there were some which had been reproduced *a jour frisont* (those on ordinary plates), whilst the compared image on an orthochromatic plate had been obtained with another lighting. That is a simple statement of fact which does not relate to the results, well recognised and appreciated by me, obtained on orthochromatic plates.

If Mr. Edwards maintains that he has not operated with different conditions of lighting, I am constrained to avow that I do not understand it at all; but I do not the less persist in finding it astonishing that upon ordinary plates there should be effects of reflections that do not exist on the orthochromatic plates.

I recognize that my ignorance is great upon such matters, for up to the present I believed that orthochromatism only modified the tonalities obtained, without having anything to do with the reflections. To my judgment, as to that of all who saw the proofs, it appeared evident that they were the result of different lightings. I intended to say nothing more than that, and I am not of those who would place a barrier in the path of progress, from wheresoever it may come, and whatever may be the means employed to realize it.

Paris, 18th January, 1890. LEON VIDAL.

THE "ROLL CALL."

SIR,—One of your "Notes" in yesterday's issue treats of Mr. Muybridge's approval of the manner in which Meissonnier draws horses in motion, and you remark, "it would be interesting to have his (Mr. Muybridge's) opinion of Mrs. Butler's 'Roll Call,' which at the time of its exhibition excited so much discussion in regard to the position of the horse's legs."

It was my pleasure to listen to Mr. Muybridge at the Associated Soirée held in Liverpool on the 8th inst. The subject of his lecture was "The Science of Animal Locomotion in its Relation to Design in Art." During the course of the lecture, reproductions of a picture by Meissonier representing Napoleon and his staff on horseback, the "Horse Fair," and "Ploughing," by Rosa Bonheur; and "The Roll Call," by Lady Butler, were projected on the screen. Whilst severely criticising the manner in which Rosa Bonheur expresses motion in the animals she paints, Mr. Muybridge had nothing but words of commendation for Lady Butler and Meissonnier, both of whom, he said, had, in the face of adverse criticism, portrayed the walk of a horse with absolute fidelity to nature. It must be pleasing to all photographers to know that their "art-science" has been the means of vindicating the artistic perception of a great English woman.

J. H. SPENCER.

36, *Bridge Street, Chester, January 18th*, 1890.

BASKET-WORK IN PHOTOGRAPHY.

SIR,—I am pleased to see that you are taking up the question of basket cases for photographic baggage, and I feel assured that it will be to the benefit of tourists to adopt this means of packing their apparatus in place of the usual leather cases.

I must, however, disagree with your opinion that palm leaf baskets will be generally adopted by photographers as those best suited to their requirements. Lightness is the chief reason of the photographer for using a basket at all. Now, strength for strength, the weight of a basket properly made of willow will be only one-half that of a palm leaf basket. As to appearance, my ideal photographic basket is covered outside with waterproof cloth, is lined inside with baize, the wicker-work is not visible, and is merely a skeleton frame-work giving the needful strength and rigidity. A handle of bamboo would do excellently, and need *not* be covered with leather, bamboo being smooth, and affording a good grip. If it be thought desirable for the wicker-work to be visible, a basket of willow can be made so closely worked as to be practically waterproof. This would add slightly to the weight and cost.

Palm-leaf baskets could never be made so closely as to be waterproof or weatherproof of themselves. I am sending for your inspection a half-plate case made with a skeleton of wicker-work, and respectfully invite your criticism. Your wide experience will doubtless suggest improvements in an article as yet imperfect.

Referring to the concluding paragraph of your article, photographers may possibly not concern themselves as to who makes their apparatus and accessories, but quality and price being equal, I venture to think English photographers will employ English workmen.

W. SCALING.

Bushford, Nottingham, January 18th, 1890.

CAMERA CLUB EXHIBITIONS.

SIR,—Will you kindly allow me to announce that the exhibition of Rejlander's photographs at the Camera Club will close on Thursday, January 30th. Until that date the Exhibition will be open to visitors, on presentation of card, from 10 a.m. to 5 p.m.

On and from Tuesday, February 4th, there will be an exhition of photographs by members of the Amateur Photographic Field Club.

This Society is known as one of the earliest devoted to landscape work. A part of the exhibition will be given up to showing results of the older processes. The collection will be open to inspection for about six weeks, under the usual conditions.

G. DAVISON, Hon. Sec.

HACKNEY PHOTOGRAPHIC SOCIETY.

Sir,—Below is our programme for February, 1890:—

Thursday, 13th—"Retrospective Photography." Mr. G. H. SLIGHT.

Thursday, 27th—"Exhibition of Members' Work and Apparatus."

Each member is expected to send on apparatus and work, to reach Morley Hall by 6 p.m. on the 27th.

W. FENTON JONES, Hon. Sec.

12, *King Edward Road, Hackney, N.E.*

Proceedings of Societies.

THE CAMERA CLUB.

ON Thursday, January 16th, Mr. R. TINDALL gave an address upon the "Plane Polarization of Light." Mr. H. M. ELDER occupied the chair.

Previous to the lecture the Secretary handed round some interesting silver prints sent to him by Mr. W. K. Burton, and he announced that Mr. Burton had contributed a paper, which would be read hereafter at the Club.

An apparatus called the "Hibbard Flash Lamp," sent by Messrs. Fry & Co., was also exhibited, and later in the evening experimental flashes were made by it. The light afforded by it appeared to be unusually brilliant, and two or three flashes of about equal intensity were obtained with one charge.

Mr. Tindall's lecture was illustrated throughout by the aid of a lantern polariscope.

At the conclusion of his paper Mr. Tindall handed round two cloud negatives—subject, blue sky and white clouds—one taken in the ordinary manner, and the other with a Nicol prism before the lens; an orthochromatic effect was alleged to be thus obtained.

On Thursday, January 30th, Mr. T. R. Dallmeyer will read a paper "On some Practical Deductions from the Law of Conjugate Foci."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 16th inst., Mr. J. L. BRIGINSHAW occupied the chair.

Mr. T. E. FRESHWATER passed round two lenses that had been sent from India to be repolished, being useless from atmospheric action on the surface of the glass.

Mr. A. COWAN had continued his experiments of the previous week with the developer published in the *American Journal of Photography*, using alternately acetate, citrate, oxalate, borate, phosphate, and tartrate of soda; twenty-five grains to the ounce were used in each case; pyro, hydrokinone, and eikonogen were severally used also in conjunction. With the exception of borate, all gave excellent results; with this developer he was unable to obtain the least trace of an image. Ordinary commercial plates were used, registering about 19 on the sensitometer, with an exposure of five seconds, three feet from a gas burner.

Mr. COWAN said the degree of density in each case was entirely at the will of the operator. The results of the experiments—in all, twenty-three half-plates—were exhibited; among them was a plate developed with pyro and sulphite of soda only. This, Mr. Cowan said, tended to disprove the accepted theory that sulphite of soda was a restrainer. All the plates were fixed in hyposulphite, to which bisulphite of soda had been added. Of the various developers used, the oxalate in connection with pyro was found the most energetic. Mr. Cowan said it was his intention to repeat the set of experiments with variations of the several developers, promising to lay the results before the members as soon as complete.

Mr. A. HADDON spoke about the importance of the various salts used in the developer being as nearly neutral as possible, and the desirability, in experimenting, of testing each salt separately. He believed in the set of experiments before them free alkali in the sulphite of soda to be the developing agent, and he questioned whether the other salts played any part at all in the development of the image.

Mr. E. B. LAWFORD showed two bromide prints of a sepia tone. After washing and fixing, he had placed them in water to which a few drops of an intensifier sent out by the Platinotype Company had been added, which changed the black into a sepia tint. (It was remarked that the whites had also become discoloured.) Mr. Lawford believed the paper used was not a pure white previous to placing the prints in the back referred to. He intended to repeat the process with pure white paper.

A question from the box was read:—"Does reversal of image take place when collodio-bromide is over-exposed in the same manner as it does in the case of gelatino-bromide?"

None of the members present had experienced any reversal of image in using collodio-bromide.

EAST DULWICH AND PECKHAM PHOTOGRAPHIC SOCIETY.

ON Friday, Jan. 17th, the President, Mr. F. W. EDWARDS was in the chair, and the following new members were elected:—Messrs. B. Lyon, E. Cann, and Robert Burch.

The subject was "Cameras, Stands, and Shutters"; among the shutters on view were Watson's snap, Kershaw's, Guerry's, Mayfield's, and Newman's. Mr. Cadett sent three specimens of his shutters, in one of which all chance of vibration was exeluded by the use of a velvet sleeve for attaching the lens to the shutter. Specimens of the optimus three-fold and four-fold stand were also shown by the members using them. One of Pumphrey's metal stands was also on view.

The discussion on shutters and stands occupied the eveniug, so the subject of cameras was postponed.

Mr. W. RICE drew the members' attention to a specimen of Messrs. Perken, Son, and Rayment's new wide angle euryscope saying that it worked at F. 9·50.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of this Association met on the 17th inst.

Mr. Lambert and Mr. Bird, of Bath, and Mr. R. Keene, of Derby, were elected members.

The Committee considered two applications for assistance; in both cases grants were made.

Messrs. W. T. Coventon, F. Haes, H. Newson, and T. Samuels were appointed arbitrators.

Friday, February 14th, was fixed for the annual general meeting.

Mr. H. J. Beasley was elected honorary secretary, and will take up his duties on the above date.

A special committee meeting was then held, and the proposed new rules formally passed; they will be submitted to the general meeting for confirmation.

ABNEY CAMERA CLUB.

AT the weekly meeting of the above, held Jan. 17th, after the discussion of the questions in the box, the Sec., M. F. H. LEEDS, A.I.C., read a paper entitled "The Chemistry of Photography," in which he discussed, from the theoretical point of view, most of the ordinary processes of photography. The chemical symbols and equations employed were illustrated by means of a blackboard.

The discussion was postponed until Jan. 24th.

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the Manchester Amateur Photographic Society was held in the Athenæum on Tuesday eveniug, last week; Mr. FLOWER presided. Six new members were elected. The President stated that the annual exhibition of the Society would be held in the Manchester Athenæum in the middle of February

Mr. M'KELLEN exhibited his latest detective camera and a plate magazine. The magazine is an ingenious piece of mechanism, fitted inside the camera without increasing the size of it. A dozen plates can be stored in the camera, and by moving a small lever each plate is dropped into a receptacle after having been exposed, and the next put in position. The movement of the plate is caused by a small spring, which makes it impossible for more than one plate to be displaced at a time. There is no fear of there being two exposures on the same plate. The whole twelve could be changed in less than a minute. Each plate is put into a thin shield which is lined with non-actinic paper, thus saving the trouble of backing the

plate. The camera when closed is focused for anything beyond twenty feet, and can be fixed at will to any distance within that. There are three speeds to it, and the shutter, working by a reversible motion, obviates all danger of exposing the plate while being adjusted. Time exposures could also be made by means of a small lever in front, which draws another shutter (inside the camera) across the lens, and thus does away with the cap. Mr. M'Kellen stated that now he never thought of using a tripod for outdoor work. Several of his friends had sent him specimens of some excellent work done with this camera. By means of a "finder" he could take a picture as well carrying the camera under his arm, or holding it in front of him.

Three lime-light lantern exhibitions followed. Messrs. Davenport and Seed showed a large number of familiar views taken in Manxland. Mr. J. W. Wade illustrated his "Scamper in Holland," starting with sea views and a picture of the busy river Maas at Rotterdam, following with pictures of the quaint streets of that town, scenes from the canals, the large arcades, and quaint bits of Dutch life about the quays. He took his audience through the parks, along the railroad to Dort, paying special attention to the old city of Delft, with its cathedral, a heterogeneous pile of conflicting architecture, and showed various phases of Dutch scenery. Mr. Wade strongly recommended photographers to pay a visit to Holland. The country afforded more subjects for a quarter-plate than even Switzerland and Norway. It was void of mountainous scenery, but it was full of picturesque views enriched by river and canal and ancient buildings. Following the "Scamper in Holland," he exhibited his "Loiterings in Lakeland."

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE third general meeting of the session was held on the evening of Thursday, 16th January, in the rooms of the Philosophical Society, 207, Bath Street, Mr. Wm. LANG, junr., F.C.S., President, in the chair.

Four new members—Messrs. James Gardner, Alf. H. Cade, Andrew Gibson, and Andrew Boag—were elected.

MR. JOHN ANNAN then showed two volumes of Calotypes printed in 1844-45, and several of the original negatives from which the prints had been made.

Mr. FRED. MACKENZIE gave a demonstration of timing the speed of a drop shutter by means of a tuning fork.

Mr. W. LANG, junr., read a communication about the late Cuthbert Bede and his book on "Photographic Pleasures." The whole of the various sketches in the volume by the author were shown by means of the Society's lantern.

Mr. T. N. ARMSTRONG afterwards exhibited his new illuminating chamber for photographs at night by means of coal gas.

Copies of Mr. Lang's paper, "Fifty Years' Photography, 1839-89," communicated last session, and printed at the request of the Association, were afterwards distributed to the members present; also tickets for forthcoming popular evening "Paris and its Exhibition," by ex-Provost Clark, of Paisley.

DERBY PHOTOGRAPHIC SOCIETY.

THE annual meeting was held at the Rooms in Derwent Street, on the 14th inst.; Mr. A. B. HAMILTON presided.

Mr. T. SCOTTON read a paper on the "Early History of Photography," concluding with a few practical hints to beginners on the more modern photographic processes.

A discussion followed, in which Messrs. F. Cooper, Cope, Hamilton, B. Cooper, and Hart took part.

THE 13th annual exhibition of bicycles, tricycles, and accessories, which this year takes place at the Crystal Palace, opens to-day. Not only is the entire floor of the Palace and courts covered by exhibits, but this year the large Concert Hall has had to be thrown open to this use.

A LAHORE paper mentions as an instance of the advance of civilisation that Abar Khan, chief of Lalpoora, who recently sent for a photographer from Peshawar, has signified his intention to learn phosography, and has detained the photographer for the purpose.

Answers to Correspondents.

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

J. A. R.—Slow toning of ready sensitized paper. This is a common experience attributable, as you say, to the use of citric acid in the final stage of preparation. Add a trace of ammonia to the last washing water before removing the prints into the toning bath. 1. The ultimate effect of the gold solution would be the same, whether the reduced silver was derived from darkened albuminate or chloride, but the first usually takes longer to work the change because of the surrounding organic matter. 2. The complete interchange of gold for silver is possible, but not desirable, for then we get the blue-black or greenish tints of overtoned prints, and the cost would be much greater without any compensating advantage.

W. B. (Reigate).—We shall be glad to hear the result of your comparative trials, and particularly would like to know how it suits your special style of work.

G. SHAW.—Your welcome letter to hand. We thank you for giving the desired permission to publish.

T. W. (Blackburn).—The card mounts are very good, and the printed address at foot quite unobjectionable. The edges are done with pure gold.

C. T. C.—The altered time of meeting will be less convenient to us, but we hope to be present.

OLD PHOTO.—Zerr's Reliefs in Gelatine. Specification No. 16,677, A.D. 1888. These are moulded in plaster of Paris, very much in the same way that Mr W. B. Woodbury did them in 1867, for his process of uniero-photo-sculpture described at the Dundee meeting of the British Association in that year, at which specimens were shown.

LIGROINE LAMP.—We have not yet seen any announcement offering for sale the new incandescent lamp described at page 170 of the YEAR-BOOK, but we are enquiring about it of our friends in Vienna, asking whether there is an agent prepared to deliver them in this country, and will let you know later on.

J. & B. DODSWORTH.—Received a sample of your new unbleached blotting-paper, which certainly bears out all you say regarding it, perfectly free from sulphates and chlorides, very absorbent, and yet immensely strong in the fibre, giving off no fluff to adhere to the prints.

T. E.—Old sulphate of iron crystals. It is doubtful whether they would be worth the trouble of re-crystallizing, but very often the ochrey incrustation is only superficial, in which case they could be rapidly washed with ice-cold water on a sieve or cullender, well drained, and once more dried.

L. A. M.—There is no fund for the purchase of historical specimens and apparatus, but an effort is being made to form such a collection, and provide for their safe custody. The Photographic Society of Great Britain put out a circular with this intention on the 24th of August last.

ART-PHOTO.—The exhibition of Rejlander's works is still on view at the Camera Club, Bedford Street, Covent Garden, and will well repay a visit. Admission is granted on presentation of your address card.

A. LANGWORTHY.—We never heard of any such process. Be so good as to repeat the leading details, some of which are not fully intelligible.

PRINTER.—The addresses of *all* photographers in the United Kingdom are not yet got together in any single directory, but you would be able to start with the Post Office London Directory, and those for the larger provincial towns, in order to get the names of professional photographers, and then work from the published lists of members of the Photographic Society, Camera Club, &c., to pick up some of the amateurs. Or, finally, make friendly arrangements with the principal dealers and publishers.

E. J. WALL.—Consult Reimann's "Hand-book of Anilines," *Chemical News* Office, Boy Court, Ludgate Hill; Watts's "Dictionary of Chemistry," vol. iv. pp. 465-473, "Aniline Dyes;" also Slater's "Manual of Colours and Dye Wares," Crosby Lockwood and Co.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1639.—*January* 31, 1890.

CONTENTS.

MAGNESIUM LAMPS.

MESSRS. SAMUEL FRY & Co. have sent us for review a little magnesium lamp, which, with its store of powdered metal, is not much larger than half an average cigar box, when all the parts are packed in their card-board case. A peculiarity of it is, that it will give from one to three or more flashes at will of nearly equal intensity; this is due to the magnesium required for immediate use being held in a small test-tube, out of which it cannot be blown all at once by a single compression of the pneumatic ball. The lamp, which is said to be highly popular in America, requires no stand, but is held in the hand, and fired off near the ceiling when it is used in an ordinary room. It gives a horizontal flash of large area, because it is so constructed as to throw the powder out in a fan-shaped blast, and the metal is then ignited by means of a large flame. In some experiments tried with it, it was found that with suitable management it is tolerably easy to obtain full length portraits without hard shadows.

Magnesium lamps require more scientific study than they have yet received. Nearly all of them allow some powder to escape unburnt; especially, of course, is this the case when the powder is blown through the flame at right angles to the longitudinal axis of the latter. Even when the powder is blown upwards through the flame, complete combustion of the magnesium is not necessarily secured—a fact which has been experimentally proved in public. When the powder is blown out by a short, violent puff of air, there is a reduction of the amount of ejected metal burnt, because it then passes more rapidly through the flame, and with most of the present lamps it may be wise to incur this loss sometimes to shorten the time of exposure. Schirm's lamp attracted some attention in Germany, because of its alleged economy in the use of magnesium; in this lamp, which was pictured last year in these pages, the magnesium was first made intensely hot, and then blown upwards through a long flame. While Schirm's lamp was in the hands of our Photographic Society, it would have been well had its action been submitted to a series of thoroughly scientific tests. The bringing together in one instrument of the best features of the Schirm and Fry lamps, particularly the abolishing of the stand used with the former, might possibly result in the advent of an advanced type of useful magnesium light.

When magnesium first mentally and physically dazzled the world, by being produced otherwise than as an extremely costly chemical curiosity, gelatino-bromide plates were unknown, and in those revered good old wet-plate days we tried some of the earliest experiments in photographic portraiture by the magnesium light. The lamp invented by Mr. Henry Larkin answered best, in which sand was mixed with magnesium powder, to carry the latter downwards rapidly from a kind of funnel into a flame below; it was then found best to do away with the neck of the brass funnel and to enlarge the orifice thereof, to obtain a flame of shorter duration, and to reduce it, if necessary, to a rapid flash. Another objection to the neck of the funnel was, that the vapour of water produced by the combustion of the flame employed to set fire to magnesium, had a tendency to condense inside the metallic neck, and by wetting the mixed powder to choke the tube, thereby stopping the action of the lamp. Mr. Larkin, when obliged to keep up a continuous light, as on the occasion when he lit up Guildhall Yard by means of gigantic magnesium lamps, overcame this defect by means of a "pricker" driven by clockwork. This pricker was a needle which vibrated longitudinally in the tube of the funnel. The modification above described of this lamp, to make it give a light of brief duration, might be useful at the present time, because the large size of the flame tends to prevent sharp shadows; indeed, it is easy to produce a flame two feet long. The greater the proportion of magnesium powder to the sand, the larger is the flame. The duration of the flame is governed by the size of the orifice through which the powder falls. The sand gets intensely hot during its descent, and will char or set fire to wood if allowed to fall thereupon if much magnesium be used.

In those early days a lamp was invented and publicly described for burning magnesium ribbon continuously, yet carrying the smoke away from the face of the flame by an air-draught from the front. This principle, with mechanical improvements in addition, has been

used in a lamp which Mr. Warnerke purchased somewhere on the Continent, and which will go on burning for a long time nearly as steadily as a candle. With proper appliances for carrying off the smoke, this instrument might prove a formidable rival to the electric lamp in commercial work in the photographic studio, the electric light being so costly.

When magnesium riband was first made it was rotten, and broke easily when handled; this defect was overcome by alloying it with a trifling proportion of zinc. As zinc gives a bluish-white light when burnt, it might be worth while to try experiments for the production of a large and brief flame of burning zinc at will, to find out what can and what cannot be done with it in photography. The photographic value of the combustion of excessively rare and costly metals yielding the more refrangible rays of the spectrum might also be tried, for it might be possible to turn out those metals cheaply now that the electric furnace and other modern inventions have placed such great powers in the hands of metallurgists, and now that more about the chemistry of high temperatures is beginning to be understood.

OBTAINING THE CRITICAL FOCUS UPON FINELY-GROUND GLASS SCREENS.

BY F. H. VARLEY, M.I.E.E., F.R.A.S.

In my article upon grinding glass focusing screens, published in your issue of November 8th, 1889, I pointed out the desirability of a finely-ground surface being obtained. The purpose of the present communication is to further develop that idea, and to show a method by which the exact or critical focus can be obtained with facility and precision.

The present method of employing a dark cloth to exclude extraneous light from the focussing screen is at its best but a fairly efficient expedient. To me it is one far from being satisfactory. First, as my eyesight is getting weaker, I require a reading lens to see the image distinctly or otherwise: secondly, to view the image at a distance of 16 inches from the screen, when I find it difficult to clearly discern special minutiæ of detail with any degree of confidence that it is in correct focus.

The employment of a lens between the eye and the surface of the ground glass is also fraught with dangers, unless the ground surface of the glass be kept distinctly focussed during the whole time of racking in or out the camera lens. When the reading lens has to be employed, it is quite possible to obtain a sharp image which is not coincident with the ground surface; it may be formed either behind or in front of the screen, according to the relative distances between the lens and the screen and the eye from the lens.

In a landscape there is always one part of the picture which it is desirable should be in critical or precise focus, and from which the foreground and distances may be more or less perfectly focussed, but not absolutely sharply defined. To obtain this critical focus I have devised a special form of the Ramsden or positive eye-piece, which insures perfectly precise focussing. This is shown in fig. 1. A is the field lens, B eye-lens, C centre of ball and socket movement, D face of the socket to be held close to the polished side of the glass screen, E clamping screw to fix the eye-lens when it is correctly in focus with the surface of the ground-glass screen, F the eye-cup for excluding extraneous light. The two lenses are plano-convex, with their convex sides turned towards each other.

The field lens should be of about 2 inches focal length, and about 1 inch to 1¼ inch in aperture.

The eye-lens three times the focal length of that of the field—viz., 6 inches. The distance between these lenses is somewhat less than two-thirds of their combined foci, say 5¼ inches. The final adjustment of the eye-lens depends upon the distance that the ground surface of the glass is from the field-lens. This arrangement forms a

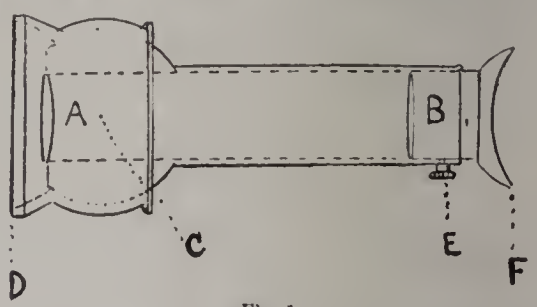


Fig. 1.

low-power aplanatic microscope on the one hand, by which the critical focus of the ground glass is obtained, and becomes at the same time a positive eye-piece for viewing the image formed by the camera lens; by this the exact coincidence of the critical image with surface of the ground glass is readily determined.

Fig. 2 illustrates its application.

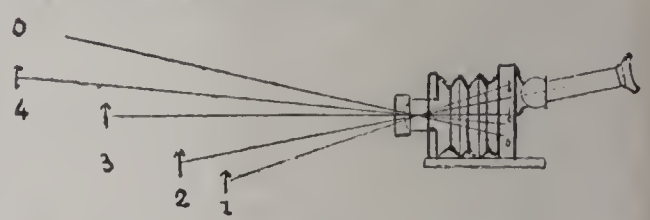


Fig. 2.

The arrows 1 to 3 represent the landscape, whilst all above may be distant mountains or sky.

The arrow fig. 2 is intended to represent that portion of the landscape which it is desirable to have in critical focus.

The use of the ball-and-socket movement is then apparent, as it enables the eye-piece to be inclined at such an angle to the ground glass as to render its optical axis coincident with the ray of light reflected from the arrow 2; this insures a greater brilliancy of illumination, and although by so tilting the eye-piece the distance of the field-lens from the surface of the ground glass is increased, this is readily corrected by sliding in the eye-tube until the ground-glass surface is in focus at the centre of the field.

The advantage gained by securing the critical focus at any desired part of the picture, I think, will be more fully appreciated as small cameras and enlarging processes come more extensively into favour; whilst the facility of focussing afforded by the positive eye-piece, I think, is worthy of the best attention of camera makers and opticians.

THE JOURNAL OF THE PHOTOGRAPHIC SOCIETY.—The last number of this journal exhibits a great improvement, which will probably render it more attractive to the public, in the shape of a great number of small paragraphs giving practically useful novel information, culled from recent photographic and other periodicals all the world over.

EIKONOGEN AS A DEVELOPER IN PRACTICE.*

BY W. K. BURTON.

IT may seem presumptuous in me to write from the other end of the world on a subject that the members of the Photographic Society of Great Britain have a much better opportunity of forming an opinion on than I have, and on a subject that will perhaps have been thoroughly threshed out before this paper can be read; but when I consider for how long new developers have often been in use before any actual comparative experiments with them and old developers have been made, or at least before the results of such experiments have been made public, I am encouraged to think that what I have to tell may not be so very much behind time after all. Moreover, the changes that may be rung on a developer by varying the proportions of the ingredients are so endless, that every experimenter working on lines laid down by himself is likely to cover some new ground, however much may have been covered already.

There have been numerous expressions of opinion as to the value of the new developer. It has been declared "as good as" and "better than" pyro. and so on. Now I quite appreciate the value of such opinions when they come from men of experience; but, after all, they are of less value than an actual detailed account of experiments undertaken for the sake of making a comparison.

There fell into my hands what I believe to have been the very first box of eikonogen that came to Japan, and I set about to compare its working with that of pyro at once, and with the most practical object that I could have—namely, to determine whether or not I should adopt it instead of my old friend in actual practice. It may take a little time to detail the principle of the experiments that I have made, but I think that if this paper is to have any value, it will be by detailing what I have done before I give the conclusions that I have drawn.

The eikonogen came into my hands carefully done up in one of the original tin boxes, on the outside of which were instructions not to open it in the presence of ammonia fumes, but in a dry, pure atmosphere. These instructions were duly attended to. There were no instructions as to the method of using it, but I had read enough in the English photographic press to know at least pretty fairly what to do with it. Briefly, this is what I understood to be claimed for it. It was intended to be used as a substitute for pyro, and was said to be quicker and more energetic in its action. The alkali recommended was carbonate of soda, and some had stated that either only very little of this should be used, or that some restraining bromide should accompany it, otherwise there was a danger of fog on account of the excessive energy of the developing action. The eikonogen was found to be a somewhat heavy, coarse powder, of a rather dirtyish pinkish colour, readily soluble in about thirty times its weight of cold water, and giving a yellow or light brown solution, which rapidly darkened in the air from the absorption of oxygen. It was neutral to test papers.

Here, at the very beginning, a series of experiments was made to test, as well as it could be done without waiting a long time, the keeping qualities of the solution. The following were the results:—In aqueous solution without any preservative eikonogen darkens much more quickly than pyro. If the eikonogen be dissolved in a solution of sulphite of sodium instead of water, the colour is light green instead of yellow. If sulphite of soda be added to an aqueous solution before it has darkened much, the colour will be changed immediately from yellow to green. This "sulpho-eikonogen" solution seems to be very permanent, and does not stain the hands. It is not necessary to neutralize the sulphite of soda with acid to get a permanent solution. The sulphite of soda that I used was a fairly good commercial sample, and was distinctly alkaline to test papers. The addition of alkali to the aqueous solution accelerates the discolouration, but not to nearly so marked a degree as in the case of pyro solution. Even when made strongly alkaline the "sulpho-eikonogen" solution discolours very slowly. A solution that had been used for development, and that was put on one side in a measuring glass, was of a very light brown colour only at the end of several days. Even the alkaline solution does not stain the hands. If an aqueous solution has turned deep brown by exposure to the atmosphere, it will change to a comparatively light brown by the addition of sulphite of soda.

The first set of experiments with pyro and eikonogen were intended merely as "feelers," so that I might get some idea of the action of the substance I was working with. I made up a one per cent. aqueous solution of eikonogen in water, and a ten per cent. solution of each of sulphite of soda and common carbonate of soda in crystals. The first developer that I tried was made up as follows:—

Pyro	...	...	...	...	2 grains
Sulphite of soda	...	...	...	10	,,
Carbonate of soda	...	...	...	10	,,

to each ounce of water. Another developer was made up with exactly the same proportions, but replacing the pyro with eikonogen.

Exposures were made two at a time in the camera, the subject being chosen to show great contrast and full gradation. A table covered with ornaments was selected, and over two vases standing side by side was thrown a black velvet cloth and a white table-napkin. The first two plates were purposely much under-exposed, the second two received a little shorter than the first exposure, the third pair a full exposure. A pair of plates was placed in dishes side by side, and at the same moment the two developers were poured over the two plates. The results were as follows:—In each case the image under pyro began to show considerably before the other, and development was complete, or had gone as far as it would go, when the plate under eikonogen was not half developed. The development under eikonogen went on steadily, however, and eventually there came out, in the first case, apparently the same amount of detail as with pyro; in the second, little more; in the third case, the eikonogen plate had the appearance of being somewhat over-exposed, the other of being just rightly exposed.

Experiments were tried with the carbonate increased by twice, and eventually by three times, but the results were exactly the same as in the first cases, except that, both with pyro and with eikonogen, the development was a little quicker. In every case the eikonogen proved much the slower developer, but on the whole there was in the finished eikonogen-developed plates a very little more detail than in the case of the others. There was no appearance of fogging with eikonogen (or with the pyro either), even when the largest amount of carbonate was used, and the colour of the image was excellent, whether the alum bath was used or not.

Further experiments were tried to see the effect of developing several plates in succession with the eikonogen

* Read before the Photographic Society of Great Britain.

—in all the experiments already described a fresh solution had been mixed up for each plate. The development became slower and slower, but on the whole the eikonogen compared favourably with the pyro, inasmuch as it appeared to become exhausted more slowly, and certainly became discoloured much more slowly. In fact, by the time that a pyro developer had become of the colour of stout, the eikonogen developer showed little or no discolouration at all.

The net results of these experiments was to show that eikonogen had at least as powerful a developing action as pyro, but that it was a great deal slower. Now I am myself in favour of slow development, and would not consider the tardy action of the eikonogen to be a drawback, but I know that no developer that is much slower than pyro with carbonate of soda will find general acceptance. My next series of experiments were therefore to determine what was the quickest modification of the eikonogen developer that I could find. I mixed a stock solution containing 2 per cent. of eikonogen and 10 per cent. of sulphite of soda. All the following developers had the same amount of eikonogen and of sulphite—namely, 2 grains of the former, and 10 grains of the latter to each ounce, the alkali and restrainer only being varied. The subject chosen was a landscape, including dark green foliage and a gate painted a glaring white, a great range of contrast being again got. A number of plates were exposed in quick succession, an exposure a little less than what I should consider "normal" being given.

The first plate was developed with the following developer:—

Pyro	2 grains
Sulphite of soda	10 ,,
Carbonate of soda (crystallized)	20 ,,

My idea in taking this as a standard with which to compare eikonogen was that, although it is a slower developer than any common ammonia developer, it is pretty quick as developers with alkaline carbonates go. I consider that a developer is not likely to become generally popular unless it will work as quickly as does this one. The plate was watched in this developer, and it was found that the image made its appearance in 20 seconds, and that development was finished in 3 minutes. I set myself then to find, if possible, an eikonogen developer that would work as quickly as this one. I tabulate the results, it being understood that the eikonogen and sulphite of soda were, as stated above, constant:—

	Developer.	Image Showed.	Development Finished.	Remarks.
	Eikonogen and sulphite without alkali.	1 min. 30 secs.	20 mins.	Full detail, but thin image.
1	Carbonate of soda, 5 grains ...	30 secs. ...	6 mins. ...	Very good quality.
2	,, ,, 10 ,, ...	30 ,, ...	5 ,,	
3	,, ,, 20 ,, ...	30 ,, ...	4 ,, ...	Image rather thin and foggy.
4	Carbonate of soda, 20 grains; bromide of potassium, 2 grains. ...	1 min. 30 secs.	15 ,, ...	Very good quality.
5	Carbonate of potassium, 5 grains ...	30 secs. ...	6 ,, ...	Very good quality.
6	,, ,, 10 ,, ...	30 ,, ...	4 ,,	
7	,, ,, 15 ,, ...	25 ,, ...	3 ,, ...	Image rather thin and foggy.
8	Carbonate of potassium, 20 grains; bromide of potassium, 1 grain. ...	40 ,, ...	4 ,, ...	Very good quality.
9	Liquid ammonia, 2 minims; bromide of potassium, 1 grain. ...	2 mins. ...	10 ,, ...	Thin image, with both chemical and colour fog.

All quantities are in grains to the ounce.

The only conclusion deducible from these experiments is that eikonogen will not work as quickly as pyro. It will be seen that in every case but No. 8, where the rapidity of development came up to, or even nearly up to, that of the pyro developer, the image was thin and foggy. Farther than that, with the above exceptions, the best negatives were distinctly those that took a considerable time to develop. It will be seen that of the developers tried, the quickest contained 20 grains of carbonate of potassium and 1 grain of bromide of potassium to each ounce, and that this did not come very much short of the pyro developer in the rapidity of its action. On the whole, as in the first set of experiments, the eikonogen appeared to bring out a little more detail than the pyro.

The colour was in all cases—except that of the ammonia developer—good, but I do not think that it was any better than that given either by hydroquinone, or pyro with sulphite and a carbonate, using the alum bath. The gradation of density—or "tonality," to use the slang of artists—was certainly somewhat different from that given by pyro, but I do not think I am able to judge whether it was better or worse. There certainly is a certain softness about the eikonogen developed negatives that must be an advantage in the case of some subjects.

It will be seen that one plate was developed without any alkali, except that due to the slight alkalinity of the sulphite of soda. The fact that this was possible induced me to try the following experiment:—Three solutions were made; they were as follows—(1) Eikonogen 2 grains to the ounce of water; (2) Sulphite of soda 10 grains to the ounce of water; (3) Eikonogen 2 grains, sulphite of soda 10 grains to the ounce of water. Three plates were flooded with these three solutions at the same moment; the results were as follows:—In the case of (3) the image appeared in two minutes, and development was finished in twenty minutes. In the case of (1) the image appeared in two minutes, but at the end of two hours little more than the high lights had appeared, and the solution was much discoloured. In the case of (2) no trace of an image had apppeared at the end of two hours.

A rather curious thing came out of this last set of experiments. I mixed (1) and (2), and with the result that a great part of the colour was at once discharged, and flowed the solution over the plate that had been under the sulphite of soda solution for two hours without being affected. I intended to see what would be the result in the way of development, but forgot all about the plate for two days, when I suddenly remembered it.

I expected to find nothing but a mass of fog, but, to my no small surprise, I found in the dish a fully developed and fixed negative. I suppose the fixing was effected by the sulphite of soda.

I ought to observe here that all the plates used so far were of about average rapidity—as so-called rapid plates of the present day go—giving something about twenty on the sensitometer, and that they were of a very "robust" kind. That is to say, they gave, with any ordinary pyro developer, very clear shadows, and would stand "any amount of forcing." I wished to try the new developer on an entirely different kind of plate, and I had by me a kind that is very common amongst commercial plates, and that is excellent for many kinds of work; I mean a very rapid plate, giving density easily with pyro, and giving a full, round image, with good gradation, under a moderately strong, or fairly restrained, developer, but fogging more or less with a developer strong in alkali unless duly restrained. I found that with such plates, using two grains of eikonogen and ten grains of carbonate of soda to the ounce, but no restrainer, I could get nothing but thin images, or, if I prolonged development, foggy plates. A corresponding pyro developer gave excellent results. It was evident that with such plates and eikonogen a restrainer must be used, and I tried bromide accordingly. I, however, thoughtlessly used bromide of ammonia, forgetting for the moment that in the presence of sulphite of soda free ammonia would be produced, and that ammonia does not agree with eikonogen at all. The images came up finely, and in the developer apparently boldly and strongly, but on fixing I had the most beautiful sample of almost ruby-red fog that I have seen. I do not think that it would have been possible to get red fog with these plates, using pyro. With pyro they would have given grey fog (if any), and it is my experience that grey fog, whether due to over-exposure or to forcing, and colour fog, do not appear at the same time under pyro. The substitution of bromide of potassium for bromide of ammonium gave quite satisfactory negatives, but the development was very tedious. The restraining action of bromide appears to be greater with eikonogen than with pyro, so that only a little need be used. In this case I found one grain to the ounce sufficient.

My next experiments were with the sensitometer. I do not intend to give these in detail, for I fear that I have been intolerably tedious as it is with all the details that I have brought before you. It will be sufficient to say that I tried many different kinds of plates, and tried over again all the developers that have been described above, with the result that it was certainly possible to get out a little more with eikonogen than with pyro. I think that perhaps there is an advantage equal to about 20 to 30 per cent. in the matter of exposure in the case of eikonogen, that is to say, the exposures might be shortened in the ratio of 6 to 5, or possibly as 4 to 3.

Here, however, came in quite a new element. I had not before tried the use of the preliminary bath of hyposulphite of soda, recommended as an accelerator. I tried it now, using a solution of 1 part of hypo in 1,000 parts of water, and merely allowing the plate to rest in this whilst I was mixing up the developer. The result when the developer was poured on the plate was startling. The image flashed out with astonishing rapidity; but I found that development soon came to an end, and that not only did no higher figure come out after the preliminary bath of hyposulphite of soda, but that it was not possible to get out quite so much as without it. The difficulty of quick development, however, was solved, and I went back to the development of plates exposed in the camera. I now found that with a preliminary bath of hyposulphite of soda, and with a developer containing two grains of eikonogen and ten grains of carbonate of soda to the ounce, the image began to show in fifteen seconds, and development was complete in three minutes—that is to say, the rapidity on development was up to the arbitrary standard that I had set up.

This finished the experimental work that I have done up till the present, and it will be expected that I give the deductions that I have drawn from it. I am tempted to do so by taking an advertisement of eikonogen that sets forth its wonderful properties under ten headings, and to set opposite each of these the conclusion that I draw from the experiments that I have just described. I put the statements of the advertisements and my own conclusions in parallel columns:—

Superiority of Eikonogen.

1. One of the principal features of eikonogen is the fact that the exposure in the studio can be reduced to half the time required for hydroquinone or pyro.	This is not the case. The exposure cannot be reduced by more than about 25 per cent.
2. Eikonogen gives a bluish-black colour covered by a very delicate precipitate, which will bring out the finest details to a degree that is not even approached by any other developer.	The colour is good, but not better than that given by some other developers.
3. It makes the task of judging a negative a very easy one, as its black colour shows the contrast and grades of light and shade much better than a negative of any other colour.	I think that it is a little easier to judge of density in the case of eikonogen than in that of other developers, not for the reason given, but because the density seems to go off less in the fixing bath.
4. A solution of this developer can always be kept on hand ready for use, and will keep over a month. The developer can be used several times, as it does not discolour in the air.	This is true.
5. Eikonogen packed in boxes will keep for years, while hydroquinone and pyro in time deteriorate greatly in quality.	Eikonogen may keep for years, although it is rather difficult to see how this has been established as yet. It is not my experience, however, that pyro, if properly packed, deteriorates. I believe that hydroquinone does.
6. Eikonogen is the cheapest developer, not only in price, but also because it possesses more developing power.	Possibly it is.
7. By using an old developing solution till all the details have appeared and then taking a fresh one, those much-desired high lights will be easily obtained. The old developer may be used in this way three or four times.	This is not very comprehensible. Is it intended to indicate that "those desirable high lights" cannot be obtained working in the ordinary way? If so, it is difficult to see where the advantage comes in.

8. It is unnecessary with this developer to maintain a certain degree of temperature in winter time.	Low temperature certainly does not retard development so much as with pyro.
9. When plates are under-exposed, they should be put for half a minute in a preliminary bath containing some hyposulphite, and details will be obtained which neither pyro, nor hydroquinone nor iron can give.	A preliminary bath of hyposulphite of soda hastens development, but does not bring out more detail than can be got without it.
10. The greatest over-exposure can be compensated by using old developer and sodium bromide, or by diluting fresh developer with two or three times the quantity of water and a little sodium bromide.	There is certainly great power of compensating for over-exposure.

Just as I have written the above it seems very dogmatic, but I wish it to be distinctly understood that I am not laying down what I write as established facts, but merely as the results of my experience gained from experiments that have certainly been numerous, and that have been carried out with due care, but that have all been done with one sample only of the substance in question. I think, however, that it is quite fair to take one sample as typical, because if it be pleaded that that particular sample was inferior, the plea will hold good on either one or other of two assumptions only, namely, that eikonogen is variable in its efficiency, or that it is liable to deteriorate.

After all, I have not answered, even to myself, the question that I started with, namely, shall I prefer eikonogen to pyro for general work? It will be seen that I consider that the claims that have been put forward in its favour are extravagant. On the other hand, it has certain advantages. One of these is its extreme cleanliness. This will probably have more weight with most people than with myself. Then, it is hard to part with old friends that you do, or at least fondly believe that you do, quite thoroughly understand. On the whole, I intend to stick to pyro for at least a little time longer, and this especially considering that I have, I believe, used up the whole of the store of eikonogen that there is in Japan, and that it will be several months before I can get a further supply.

POSTSCRIPT.

Some remarks that I read in one of the photographic journals since the time that my paper on eikonogen was written remind me that in the comparative experiments that I made I omitted almost the most important of all comparisons—namely, that of the difference in effect produced by varying the quantity of the eikonogen itself. I was led to this omission by having my mind too much bent on the action of pyro. It is well known that in the case of this substance the effect of the increase of quantity is not to accelerate development either in the matter of time that it takes for detail to appear, or in the matter of the eventual amount of detail that can be got—that is, working within pretty wide limits. It did not strike me that it might be quite different in the case of eikonogen.

I first set myself to establish the statement made above with regard to pyro, which I had in my mind only as a general impression, not as the result of any comparative experiments. Several plates were exposed for the same length of time in quick succession, and a set of developers was made up, each precisely the same except in the matter of the quantity of pyro contained. This was varied from two to ten grains to the ounce. The plates were placed side by side, and were developed by pouring the different solutions simultaneously over them all. Those images which were under the strong pyro appeared to come out a very little before the others. Perhaps there was a difference of five or six seconds between the one and the other end of the row of five plates. After a little time, however, all appeared to be at about the same stage; that is to say, so far as the eye could judge, the same bit of detail appeared on all plates at just the same time. The plates were removed from the solutions at the same time and fixed together. When they were fixed, those that had had the greatest amount of pyro were the densest, but the difference was much less than I expected. Those that had had the most pyro also had the appearance of having had less exposure than the others, but this was due rather to a certain harshness of gradation than to the actual absence of any detail that was visible in the others. The few experiments that I could make with eikonogen immediately showed that with this substance the effect of increasing the strength of the solution is quite different from what it is in the case of a pyro solution. Increase in the quantity results in very great increase in the rapidity of development. Unfortunately, by the time that I had reached this stage, I had too little eikonogen left to enable me to make a set of thoroughly comparative experiments. The results I did arrive at, however, were that increasing the quantity of eikonogen to 5 grains to the ounce, I got with the same quantity of alkali the same rapidity of development as with a pyro development. With pyro developer, however, 2 grains to the ounce gives as great a speed of development as does 10, and gives more satisfactory negatives. I therefore conclude that it takes about 5 grains of eikonogen to equal 2 of pyro, and this especially as negatives developed with that amount of eikonogen showed no tendency to hardness. It will be seen that this knocks on the head the idea of the comparative cheapness of eikonogen, unless the manufacturers reduce the price to less than half that it is at present. I could not make out that the strong eikonogen had any advantage over the weak in the actual amount of detail brought out.

THE next annual dinner of the Photographic Society of Great Britain will take place at the Café Royal, Regent Street, on February 10th, at 6.30.; tickets, six shillings each. Early applications for tickets should be made to Mr. W. England, 7, St. James's Square, Notting Hill, W.

PRINTS AND DRAWINGS.—Those who are interested in the Egyptian mummy, or the Roman urn, or in the mysteries of ancient manuscripts and rare prints, will be glad to know that some instructive lectures upon these subjects as exemplified in the British Museum, will be delivered in the coming month at the Steinway Hall, Portman Square, by Mr. Louis Fagan, of the Department of Prints and Drawings. The first lecture will treat of the origin of the Museum collection, through the bequest of Sir Hans Sloane, nearly a century-and-a-half ago, of its gradual progress, and of the Egyptian, Assyrian, and Babylonian antiquities; and the second and third lectures will deal with the Greek and Greco-Roman antiquities, the library, manuscripts, and prints, and the character and constitution of the Museum. Photographic reproductions of the objects described, by the oxy-hydrogen light, will be exhibited, so that subsequent reference to them may be facilitated. The history of our national collection in Bloomsbury is one of decided interest to students of art and science. No inconsiderable part of it existed under the designation of the British Museum for more than three-score years before the building which now contains it was commenced.—*Daily News.*

EIKONOGEN.

BY LYONEL CLARK.

It is, perhaps, beyond the bounds of reason to expect that every new production should be presented to us only when it has attained a condition as nearly approaching perfection as is obtainable by mortals, but still one may be permitted to express a very decided wish that it might be so. The series of somewhat exhaustive experiments that I made on the behaviour of the newest claimant to popular favour as a developing agent were hardly finished, when a new form of this same salt is introduced that is manifestly superior to the old. Wishing, however, was of no good, and there was nothing else to do but to start again, and repeat in a form simplified by experience the previous experiments.

In appearance the new sample of eikonogen presents a great superiority over its more ancient rival; whereas the latter was in the form of a palpably discoloured, sand-like powder, the former is in pure and well-formed crystals of a slightly yellowish colour. Its behaviour when in solution is also distinctly different. The old sample, when dissolved in water without the addition of any sulphite, instantly decomposed, turning of a deep port wine colour, that rapidly thickened; whereas the new sample only slightly discolours the water—a similar difference is apparent, even when sulphite is used, the old sample forming a deep green-coloured solution, whilst the new one gives a faintly yellow one. It is quite evident from these facts alone that the discolouration of the older sample was due to an incipient oxidation of the crystals themselves, which became more apparent when in solution, and was no doubt the cause of its so soon becoming muddy, and losing its clearness.

The amount of solubility of the new does not appear to vary very much from that of the older sample; as a matter of fact, it is not very easy to determine the amount of solubility very accurately, as it varies according to the temperature; in boiling water a large amount is taken up, but on cooling down to 60° F. or so a large amount crystallises out. On the whole, I should consider about fifteen grains to be the maximum amount that can be dissolved in one ounce of water to which thirty grains of sulphite of soda have been previously added.

However, my practice at present is to make up a solution of a less strength than this—that is, one of ten grains to the ounce—to which I add twice the weight of sulphite of soda and an equal weight of carbonate of soda; I make these up with boiling water, in which I first dissolve the sulphite completely, and then add the eikonogen. I use boiling water, for by this means all air is expelled, and there is less discolouration of the solution from the absorption of the oxygen of the imprisoned air, for a developer so made up is complete in itself, and will equally as well oxidize at the expense of the air as it will at the expense of the partially reduced silver haloid of the negative.

In my first experiments I found that the developing action of eikonogen lay entirely in the salt itself—that is to say, that it did not require the addition of any alkali to cause a reduction of the silver, although, at the same time, the rapidity of its action was increased when either the fixed or the caustic alkalis were added. But the gain was not very great, and, beyond a certain point, a further increase of alkali made but little difference; indeed, if the added alkali were in a somewhat dilute solution, owing to the general weakening of the developer, a loss of density followed, instead of an increase in rapidity of development.

It is this behaviour that so markedly defines eikonogen from the alkaline pyro developers, and makes it much more analogous to ferrous oxalate. The developing power lies in the eikonogen almost entirely. If this be present in large quantities, the development is very rapid, and great density is obtainable; if the eikonogen be present in small quantities, it develops slowly, and no density at all is obtainable by it; but in both these oppposite cases it will be found that the same amount of detail will be brought out, if time be unlimited. With pyro, on the contrary, an extremely rapid developing action can be set up, even with a minimum amount of this salt, and, indeed, a further addition of it will actually tend to slow the development. We can undoubtedly prepare eikonogen developers that shall be suitable for any class of work, but they must be prepared beforehand; they cannot, like an alkaline pyro developer, have their character totally and instantaneously altered by very small additions. This is doubtless due to the insolubility of the salt itself. If we could only add it as we can pyro in the dry state, its power might be vastly increased; but, as it is, we have to make up solutions beforehand, and we can only modify their action in one direction, unless we resort to the somewhat bulky expedient of having several baths of different tendencies.

I think, therefore, that for that class of work where the exposure, although ample, has been more or less of a hazard, or where the general scale of lighting has been unsatisfactory—that is to say, for the best class of landscape work—eikonogen will not displace the alkaline pyro; but for that class of work which is usually termed *instantaneous*—that is to say, where the exposure has been so short that every part of the plate has received the minimum of exposure, and yet every detail must be forced out, and at the same time, every effort be used to obtain density—for this class, eikonogen presents most marked and useful advantages over any other system of development with which I am acquainted.

To begin with, it is absolutely free from all tendency to cause green fog, with its unpleasant iridescent stains; even when used as strong as possible, no discolouration of the gelatine is perceived. Secondly, a greater amount of intensity may be given to the slightly exposed portions by eikonogen than by any method of pyro development. I satisfied myself of this fact when experimenting with the older sample, and with the newer one I find it still more accentuated. Lastly, eikonogen has a peculiarly sedate way of going about development: it never seems to start things with a rush, causing streaks and stains, but builds up the silver image as quietly and as surely as the coral insects build up their atolls. I have had a good experience of its behaviour in this respect lately, having had to develop in great haste a spool of the new rollable celluloid film, containing some sixty exposures. I manipulated them as if they were prints being toned, putting half a dozen of them into a dish at once, and simply turning them over from time to time; half the spool was developed in this way with pyro and ammonia, and the other half with eikonogen. No difference is observable in the results as regards either the amount of detail brought out, or its density; but whereas the pyro-developed negatives are marred by green fog and local stains, those developed with eikonogen are all equally clean and clear. When one considers the careless and hasty way in which they had to be treated, this fact speaks very highly for this new developer.

The developer that I used in these trials, and the one I have now generally adopted for short exposures, was compounded as follows:—200 grains of sulphite (crystallized) were dissolved in ten ounces of boiling water; when dissolved, 100 grains eikonogen (crystallised), 100 grains carb. sod. (recrystallized), and 5 grains of bromide of potassium were added. On cooling, no precipitate should be formed, the solution being of a clear yellow colour. This clear yellow shade gradually gave way to a reddish claret colour when a negative was developed in it, and subsequently darkened to a full port-wine colour, remaining, however, clear and free from muddiness. On the following day some more negatives were developed, but the bath then began to lose its power; but on the addition of a little fresh saturated solution completed its task, and was then thrown away. From the results obtained—for the whole lot of negatives were hand camera work taken at the beginning of the present month, when the light was extremely feeble—I feel convinced that no better developer for such work is at present known; and, considering the number of negatives developed, it works out by no means a costly one. As I have before now pointed out, when used for solitary negatives, eikonogen is at least three to four times as expensive as pyro; but when a batch of similarly exposed work is to be done, its cost is considerably and proportionally diminished. A developer like the above can be prepared in large quantities, and if stocked in small bottles filled up to the brim, and tightly corked, it should keep indefinitely.

The quantity of sulphite used is small, being only twice the weight of eikonogen present; but since, when kept protected from the air, it does not appear to go wrong, and remains sufficiently clear during development, I failed to see the use of adding more. Of course if it were desired to keep the once-used developer for subsequent use, a greater amount might perhaps be advantageously added; but I can never advocate such a system, as it is impossible to guage the strength of a spent solution, and its use degenerates development from a science to simple chance. The only other solution that I can tolerate would be a saturated one—that is, dissolve about 300 grains of sulphite in 10 ounces of water, and add as much eikonogen to the boiling solution as it will take up, and also about 150 grains of potash, and let the excess crystallize out on cooling. Such a developer may be reserved for the most under-exposed cases, and if it will not give them printing density, I really do not know what will. At the same time, should—from the light having been better than estimated—the negatives begin to show signs of hardness, this may be remedied by diluting the developer with a solution of carbonate of soda, say of a strength of ten grains to the ounce, as much as an equal amount or less of which may be added to the normal developer as the appearance of the image dictates.

In generally comparing the new and the old samples, I may say shortly that the new, being clean and free from oxidation, an equal weight has greater developing power; and this freedom from oxidation renders practical, what I found with the old sample impossible, namely, the preparing and keeping of stock solutions in an unaltered and unweakened condition. It was this proneness to oxidation, coupled with its great insolubility, that compelled me to relinquish with regret the use of the old sample, for I had already recognised the great power that the developer had of giving full density to very slightly exposed plates; but the superiority of the new sample now obviates this, and I shall certainly have recourse to it for all hand-camera work, although I do not feel disposed to replace pyro from its use with my larger and more carefully developed work.

AMATEUR PHOTOGRAPHY IN PARIS.

THE *Daily Telegraph* says:—"The camera, the sensitive plate, and the developing chamber now reign supreme in Paris. A certain foreign Count has succeeded in resuscitating the long-languishing method of executing photographic portraits of the carte-de-visite instead of the album size; while yet another Count, Primoli by name, said to be a descendant of Lucien Bonaparte, has, after making a brilliant photographic conquest of the salons of Rome and Florence, descended on those of Paris, armed with an apparatus for taking instantaneous light-portraits. "Le revolver-camera" has already been heard of; but Count Primoli appears to be the first amateur practitioner who has made the invention fashionable.

"Enterprises of a more exalted artistic nature, however, are spoken of in connection with the magic art of Daguerre and Fox Talbot. The Baroness Adolphe de Rothschild has installed a photographic studio on a superb scale at her Château on the banks of the Lake of Geneva, where she has produced a series of portraits not only as photographically life-like, but as artistically vigorous and refined, as those for the painting of which in water-colours the Princess Mathilde Demidoff, *née* Bonaparte, has acquired such bright celebrity.

"Naturally the sculptors and the aquarellistes feel little satisfaction at this new development of practical art among the 'grandes dames de par le monde' in France. A very few lessons will convert any person of average intelligence into a tolerable amateur photographer; indeed, with the aid of a lucidly written manual and an efficient apparatus, the craft is one which can be self-taught. On the other hand, the studio of Madame de Rothschild on the Lake of Geneva may be regarded as a wholly exceptional experiment, and one not more likely to injure either professional painters or professional photographers than M. Mollier's amateur circus is to shut up the cirque once known as Franconi's."

ON the first of January, 1888, there were 110 members on the rolls of the Photographic Society of India; now there are 205, an average increase of eight members per month for the whole year. Twenty-six have been enrolled since November last, so the average monthly increase is now not less than 13. Three new members every week is a criterion of the growing popularity of the Society.

NATIONAL PHOTOGRAPHIC EXHIBITION.—With the intention of securing for this Exhibition a thoroughly national character, the directors of the Crystal Palace Company have decided to offer a valuable challenge cup, to be retained for the current year by that Photographic Club or Society which, in the opinion of the judges, sends the best collective exhibit of not less than fifty pictures. The following are the conditions:—(1) All pictures entered in this competition will be subject to the general rules of the Exhibition, as published, where applicable; (2) There will be no entry fee charged for the club challenge cup competition; (3) The pictures included in a joint club exhibit are equally eligible for awards in their several classes, but a separate application form must be filled up by the individual exhibitor, and, in the case of professionals, the stipulated fee enclosed; (4) The challenge cup will be handed over to the Mayor or other public functionary of the town or district in which the head-quarters of the successful Society are located, to be held by him, in trust, for a period of one year, at the expiration of which it shall be returned to the Crystal Palace Company; (5) the name of the successful Society will be engraved upon the cup or pedestal, with the date of the award; (6) The challenge cup shall be confined to Societies within the United Kingdom, and provincial makers and dealers, it is said, will be more fully represented this year than upon previous occasions, and the Exhibition is accordingly expected to be more generally interesting.

THE LATE CUTHBERT BEDE AND HIS BOOK "PHOTOGRAPHIC PLEASURES."*

BY W. LANG, JNR., F.C.S.

In the next picture we find photographic processes still further gone into. As each drawing has its title underneath, you will be able to extract the humour without the aid of any explanation of mine.

A "Photographic Fix" is our next subject. "Mr. Jones, being on his way to the lakes, embraces the favourable opportunity of calotyping some fishing boats on the Ulverstone Sands, Morecambe Bay. The tide unexpectedly comes up during the time that his head is beneath the hood; disagreeable position of Mr. Jones on emerging from the hood."

Then we come to a series of photographic fancies:—Applying the black varnish, best black varnish (a copy of "Uncle Tom's Cabin"), applying an exciting fluid, &c.

The following illustration is entitled "To secure a pleasing portrait is everything. Daguerreotypist to cheerful sitter: 'The process will commence as soon as I lift up this slide. You will have the goodness to look fixedly at one object, and call up a pleasant expression to your countenance.'"

Another page of photographic facetiæ is to be found in the twelfth illustration, where we find a photographic bath, photographic abstraction, developing solutions, all portrayed from the Cuthbert Bede point of view.

In the chapter entitled "Photography in a Love Light," we find our author has one or two passages which are extremely pathetic, and I may be permitted to quote them.

The picture which we find interpolated in the chapter we have already quoted from, viz., "Photography in a Love Light," is representative of "one of the pleasures of photography," visiting country houses and calotyping all the eligible daughters, and the picture in question you now have thrown upon the screen.

Another illustration of photographic facetiæ comes after the foregoing, and we will leave it on the screen for some little time, so that the details may be studied.

Perhaps one of the most humorous sketches in the book is the one entitled "A Photographic Positive." The picture, which, if I mistake not, appeared in *Punch*, is self-explanatory.—Lady Mother (*loquitur*): "I shall feel obliged to you, Mr. Squills, if you would remove these stains from my daughter's face. I cannot persuade her to be sufficiently careful with her photographic chemicals, and she has had a misfortune with her nitrate of silver. Unless you can do something for her, she will not be fit to be seen at Lady Mayfair's to-night."

The appearance of the lady amateur with her mottled visage is a fine bit of humour, and is portrayed in a manner worthy of Cruikshank. I fancy our professional members will rather enjoy this hit at the amateur dabbler in photography, and perhaps some of them may be going the length of saying, "Serve her right!"

The next picture to be thrown on the screen, as you will see from reading underneath, is called a photographic picture. Here you see a man focussing, and an old lady, who appears suddenly from round a corner, and who is not used to these new-fangled notions, is made to say, "Please, sir, don't for goodness' sake fire, sir!"

In his preface the author refers to the fact that four of the pictures in his book had appeared in *Punch*, but he does not, I am sorry to say, indicate which particular ones these are. I rather think I have seen the one which I am now going to show you in the journal in question. It has for title, "What it has come to, and, What it may come to." In the former we find a young hopeful addressing his father, an ardent amateur, you may take it for granted. "Oh, pa! me and baby have emptied out all your bottles, and have cleaned them so nice!" and in the latter, What it may come to; or, the British nursery in 1865, a nurse is found asking the child in its chair, "Did it want its camera then?" and the reply, "No, I don't; I want to go and print off my negatives! Boo! hoo! hoo!"

Passing on, we come to the method prescribed by Bede for procuring a photographic negative. He says, "Take any village, and in its vicinity select a field through which there is a public way. Focus your view, and make all ready for the negative. While the process is going on take your seat upon the next stile—the more distant the better—and lose yourself in the leaders of the *Times*. You will thus be giving an opportunity to children of a speculative turn of mind to solve their doubts as to what your camera really contains. At the expiration of twenty minutes, shut up your *Times*, and return to your camera. When you take out your slide you will find that you have secured a most excellent negative!"

Photographic faces comprise the following: Brown sees his face in the glass, and thinks he is rather an agreeable looking fellow; Brown sees his face in the negative, and his second thoughts are by no means the best. Portrait of a very beautiful lady, who has had the misfortune to sneeze at the moment of the removal of the cap. Portrait of a very unsteady gentleman. Lady, with hood, time of Elizabeth, and camera, with hood, time of Victoria. Phœbus Apollo, portrait painter to General Earth.

Exciting for the sensitive, has the accompanying letterpress. Outraged protectionist (whose ideas have not been developed in proportion with those of the photographer): "Ho, you there! 'illo! I'll teach you what it is to bring your theodderlite 'ere, and come a measurin' for railroads on my land."

Photographic people are next hit off. Fancy portrait of Dr. Diamond. A sitting with Beard. Portrait of Dr. Diamond in his calico bag. Look on this picture, The Hon. Miss Haggis, from the portrait by Chaldon, R.A., and on this, the Hon. Miss Haggis, from a Daguerreotype. Gems from the Blackguards' Photographic Portrait Gallery. Brown is, of course, naturally anxious to see how Smith looks in the camera. Mr. Wedgwood, from a photograph by himself. Photographer: "Be pleased to look straight at me sir!" Sitter: "Why, dang it, I've been a-doing it these ten minutes!"

We come now to a picture which Mr. Bell will no doubt appreciate, the photographic detective, and photographic focussing and hocussing. Mr. Priggins as he appeared before the "Beak," Mr. Priggins as he appeared before the camera. I'm afraid the conditions are now reversed, and Mr. Priggins will not now look so amiable.

A Photographer Astonishing the Natives.—"Come along, Betsy Jane, do, and look at the man with the Peep Show." This picture, the author tells us in a footnote, appeared in *Punch*.

The last sketch in the book is entitled "The Present Attitude of Photography," and in the concluding chapter we find the question asked, "What is there that our friend camera will not do?" and I may be permitted to quote the last paragraph or two, and it will be a matter of especial interest for us as an association to find therein an allusion to a former president. I refer to Mr. Kibble.

* Concluded from page 72.

Notes.

A French professor of physiology (Dr. Verdin) has compiled a sort of code of human expression, his theory being that for every weakness or vice there is a corresponding cast of feature which affords an infallible index to the character of the man. Dr. Verdin is trying to do what Lavater failed in. Physiognomy is true enough where broad generalities are concerned, but when minute subdivisions are made, two professors of the science are as likely as not to differ. Still experiments in connection with the human face are always interesting, and this theory of Dr. Verdin's is one where composite photography is likely to prove useful. If we mistake not, Mr. F. Galton's composite photographs of criminals were made from the faces of prisoners taken indiscriminately. If it be really possible to localise a vice or weakness, it would be necessary to classify somewhat minutely.

Thus, we might get the typical expression of the pickpocket, the burglar, the forger, the poacher, the "smasher," and a host of others. Murderers in England are not numerous enough to afford material; they therefore must be left alone. So also must the individuals which the *Echo*, in commenting on this subject, wishes to be distinguished. If Dr. Verdin can help us, says our contemporary, to distinguish an honest company-promoter from his dishonest brother, or a well-meaning "outside" stock-broker from his disingenuous fellow-labourer in the vineyard of finance, humanity will be grateful. Doubtless; but we are afraid Dr. Verdin protests too much. At present it would be certainly unsafe to rely upon subtle distinctions of the kind we have referred to.

At the last meeting of the Royal Astronomical Society, Mr. Maunder incidentally stated that there was a work about to be begun at Stonyhurst which was certainly much wanted, seeing that we are entering upon a new solar period. The work referred to is the regular photography of sun-spot spectra. A photographic record of sun-spot spectra will have a great advantage over eye records, in that it can be referred to afterwards; and if there is any difficulty or doubt, the question can be settled by reference to the photographs. Mr. Maunder mentioned, as an instance, that in the earlier observations made at Greenwich of the spectra of sun-spots, he saw that lines were broadened over the spots, which were mostly those of well-known and well-marked Fraunhofer lines. As time went on, he found the broadened lines were lines which could not be ascribed to any element, nor could they be even seen on the general disk. At first Mr. Maunder thought there must be a mistake on his part; but he found that precisely the same observations had been made at the same time at South Kensington, so there could be little doubt that there was a genuine change in the character of the spot-spectra. But if his observations had stood alone, it would have been very possible to have accounted for them by supposing that, when fresh to the work, he had naturally been attracted to the more conspicuous lines, but that afterwards, when he had had more experience, he had been able to observe less important lines. "If we have a photographic record," observed Mr. Maunder, "we can consult old photographs, and no doubt whatever could arise."

Photographs have over and over again formed an important element in the evidence in divorce cases, but rarely in so novel a manner as in a Scotch divorce case trial last week. The respondent, in accordance with Scotch law, had been cited to appear, but she took no notice of the order, and a photograph was put in for purposes of identification, and to show that the order had been duly served upon the right person. To this photograph the respondent's counsel took an initial objection, and after the evidence had been heard, contended that the Court should find the case "not proven," on the ground that the photograph was not sufficient. Lord Trayner, however, held that the photograph was admissible, and not only so, but that the photograph of the co-respondent, who did not appear, should be admitted, and pronounced for the petitioner. It is not every judge who is such a believer in the faithfulness of photography. Cases might be cited where the judge absolutely refused to receive photographs as evidence of identification. A good deal, perhaps, depends upon the photograph.

If Mr. Brudenhall-Carter's assertions at the Society of Arts, as to the fallacy of the tests in use to determine whether a person is colour-blind or not, be correct, the sooner an exhaustive series of experiments be made the better. Dr. Carter points out that a man may have learnt by experience that the light which appears to him dull green is called "red" by the majority, and when that colour is shown he promptly gives a correct description. But the uselessness of this test appears with calamitous results sometimes when the true green light is blurred by atmospheric conditions. The truth seems to be that really very little is known about colour-blindness. The two colours, green and red, are selected as the most important for accurate observation, as green and red are the danger signals generally in use; but may it not be that there are just as many people unable to distinguish between blue and orange as between green and red? We have also never seen it recorded what was the experience of a person, whose eyes were insensible to the red rays, when shut up in a photographer's dark room. Would he see green?

It is rather amusing, after visiting the Exhibition of the Humorous in Art, to find "Atlas," in the *World*, indignantly protesting against the length to which caricature is carried now-a-days. To look at Gillray, Woodward and Rowlandson, and Cruikshank, and compare their gross perversions with the productions of

"Ape," "Lib," and "Spy," the drawings of the latter appear absolutely refined. It is by no means certain that photography has not rather injured caricature, though whether this is to be regretted we need not enquire. When a comic artist has to caricature a public man, he buys his photograph, and makes a sort of fancy distortion. This is not caricature, for the essence of caricature is truth, but truth, of course, exaggerated. The older caricaturists made their drawings from the life, and only after much study—hence their force. The coarseness was that of the age, and neither added to nor detracted from the truth of the exaggeration.

Photography has made the work of the lecturer far more interesting to his audience than used to be the case. In former days, all that the lecturer could do when he had any specimens illustrating his lecture, was to invite the audience to step on the platform at the conclusion of the proceedings and make an inspection. As a rule, about half a dozen persons used to respond to the invitation, and all the rest hurried away in order to catch their tram or omnibus. We manage things better now-a-days by having photographs made wherever it is possible, and throwing these on the lantern screen. The advantage of this plan was admirably shown this week at a lecture on the history of printing delivered at the City of London College. The accuracy and facility with which manuscript and printed books can now be photographed render such objects peculiarly suited for lantern slides, and the whole audience were enabled easily to see what, in the old days, would have been visible only to a few. The photographic lantern slide plays the same part in a lecture as illustrations do in a book; it enables a larger number of people to take an interest in subjects which otherwise might seem dry and repellant.

The "Photographic Union" of France, described as a Mutual Help Association, and corresponding very much to our Photographers' Benevolent Association, has started very well. Before even the objects were formularized, and the basis of the society established, subscriptions began to flow in, and though the members are fully conscious that much cannot be done until a permanent fund has been created, a very respectable nucleus has been got together. The Association is founded on the system originated by Baron Tayler, who created so many associations of a kindred nature, all of which are now rich and prosperous. The main principle of this system is essentially sound, as it involves the inalienability of the capital, all help being derived from the revenue. At a meeting held recently the scheme was explained by M. Vidal, and it was stated that, after an appeal had been made to the photographic profession generally, steps would be taken to bring about a public recognition of the utility of the association. Already subscriptions to the amount of 4,000 francs have been announced, and these will doubtless be followed by others.

SELECTING FOCAL DISTANCE WITH DETECTIVE CAMERAS.*

BY W. E. DEBENHAM.

THE expression forming the title of this paper may be used with two significations: involving either the choice of the focal length of lens that it is desirable to use; or, when the lens is decided upon, the use of it either at the distance from the plate which corresponds with its focal length for objects in the extreme distance, or at some distance which shall bring into more exact focus some object which is nearer.

There seems to be a good deal of misapprehension, not, perhaps, amongst the members of this Society, but amongst those who derive their principal impressions about photography from the statements of dealers, and from their happening, in their occasional reading, to come across what may be called pseudo-scientific papers, concerning the capabilities of a photographic lens for focussing simultaneously objects at different distances. Here it may be well to remark that, owing to curvature of field, almost any lens will focus simultaneously objects at different distances, if such objects fall upon parts of the plate, some nearer and others farther from the centre of the field of the lens. What, however, is meant is the capability of focussing at the same time, objects which are either on the same part of the plate, or at an equal distance from the axial line of the lens. As an illustration of the misapprehension referred to, may be cited a statement that has been the subject of comment at this Society, as to the advantage of some lens which was supposed to have a fixed focus. Another absurdity is that of setting up some standard of a permissible amount of confusion, such as that of $\frac{1}{100}$ of an inch, and then proceeding on the assumption that all parts of the picture in which that amount of confusion is not exceeded, are in focus. The falling off of focal sharpness is gradual, and there is no definite line of demarcation where sharpness begins, whether at the $\frac{1}{100}$ of an inch, or at any other limit. If, on the one hand, there were such a distinction line of demarcation; and if, on the other hand, we were able in general work to avoid photographing all distances where confusion due to want of focus exceeds such limits—if both these conditions were fulfilled, a table showing distances with particular lenses where sharpness could be secured would be very useful. As a matter of fact, neither of the conditions is fulfilled. Sharpness does not begin at any measurable limit, and we are constantly meeting with subjects where any such attempted limit must be exceeded in some part of the picture. We must minimise our loss of sharpness as much as the particular circumstances will permit. There is, of course, a limit to the defining power of lenses, as well as, perhaps, to the power of the photographic film to register minute details, and of human observation to appreciate such details when registered. When these limits are reached, and any two objects, however much they may differ in distance, are rendered simultaneously upon the plate with such definition that no deficiency is discoverable in the one when the other is focussed, they may be said to be both in focus.

This apparent equality of focus of objects at widely different distances is always reached if the nearest of such objects is only removed sufficiently far. There is no photographic lens in the world—I am, of course, not speaking of telescopic objectives—which will show any differ-

* Read at the London and Provincial Photographic Association.

ence of focus for objects, the nearest of which is a mile, whilst the others may include the moon at a distance of some hundreds of thousands of miles, and the planets at many millions, or the fixed stars at still greater distances. If a lens of twelve-inch focus could be made of such perfect defining power as to show a difference of adjustment required when focussing between these limits—that is, at a mile, and at the greatest conceivable distance respectively—the adjustment necessary would amount to about the $\frac{1}{1000}$ of an inch. As, however, that amount of racking in or out makes no discoverable difference in the sharpness of the image given by such a lens, objects not requiring more than that adjustment may be considered to be in focus. When, however, we come to distances which have been mentioned as those beyond which all objects are in focus, such as 100 feet, 50, 30, 20 feet, or even less, the case is very different. With a lens of 5-in. focus, the difference of adjustment for objects at 20 feet and beyond will amount to about the $\frac{1}{60}$th of an inch—a difference which, as a very slight amount of practice will suffice to show, produces a very appreciable difference of distinctness in the focus.

Since we cannot hope to focus truly at the same time near and distant objects upon the same part of the field of the lens, the question becomes, how shall we proceed so as to reduce the indistinctness due to imperfect focus to the smallest amount? What length of focus shall we choose for our lens, and shall the instrument be set so as to truly focus the extreme distance, or some nearer point? In answer to the first part of the question, both long and short focus lenses have been advocated, and each with reason, if a particular class of subject is in question. The principal argument in favour of long-focus lenses for a given size of plate, is that as the field of definition is always more or less curved, and the longer the radius—which means the less the curvature—the nearer to it will be the flat surface of the plate. Another argument, relating to a consideration not now under discussion, is that with a long focus lens any selected object will appear of larger size, and assume greater importance in the picture. For the short-focus lens, it may be argued that objects differing in their distance from the instrument, will be represented as less removed from the focal plane than with the longer focussed instrument.

This is a very significant consideration, and one which is of the greatest importance in detective camera work for the most part. Let an object at, say, 20 feet distance, be included in a view taken with two lenses, one of 3-inch and one of 6-inch focus, each stopped to the same rapidity, and each focussed for some object in the extreme distance. The blurring of the near object will be double with the 6-inch lens than it will be with that of shorter focus. It is not merely that the blurring with the lens of shorter focus will be reduced to smaller proportions because the whole photograph is smaller, but that when both are enlarged to one size, the enlargement from the short-focus lens will show only half the blurring that the other does—that is to say, the representation will be as distinct as if the longer focussed lens had been racked half the distance required to suit the particular object.

Here, then, is a great advantage for the short focus lens, against which must be set the disadvantage for the particular plate, but not for one of proportional size, of want of focus towards the margin, owing to curvature of field. There will also be further want of definition towards the margin from other optical causes; but taking the curvature of field alone, that may sometimes be turned to a positive advantage.

The most common case in which this is seen is in photographs of interiors, which are not generally detective work, and in street scenes, and such similar cases, where the side objects are much nearer than those occupying the centre of the field. The curvature of field of the lens is a matter that I think photographers, especially those who go in for detective work, would do well to study. If we are obliged to put up with the drawbacks attendant upon curvature of field, let us take advantage of any possible help which it may occasionally render. It will be found then, with any ordinary detective lens, that as we approach the margin of the field, an object to be in the best obtainable focus must be much nearer to the instrument than the distance which has been focussed at the centre of the field. Suppose that we have a lens of 5-inch focus used with a quarter-plate. We may find that when it is focussed for the distance at the centre, an object occupying a spot 1½-inch distance from the centre of the ground glass will be in focus, when only about twenty-five or thirty feet off. If we are capable of judging distances tolerably, and have either previously noticed on the ground glass or with the finder what part of the scene will be occupied by an object which comes 1½-inch from the centre of the plate, we may succeed in catching a near object of interest when in focus, without disturbing the general focus for the distance. This case is put as an illustration of what may be done. We may, for instance, note a place in a line of roadway along which vehicles travel, and by getting a horse, dog, or foot passenger there when passing a spot at a certain distance from the centre of the plate, get it just at the focus for that part of the plate, although at the centre it would be decidedly out of focus.

We now come in conclusion to the consideration of whether it is desirable for general detective camera work to have the lens focussed for the extreme distance, or some point at the distance, as near as may be, at which it is anticipated that objects of interest will appear.

Of course the object of special interest should not be decidedly out of focus, and therefore it would be better to focus for that, if there is a ready means of adjustment, or if that probable distance is known beforehand. If such object come in the centre of the plate, the lens must be racked out, and the distant background will be out of focus. It has, however, been shown that with a short focus lens and tolerable wide angle of view, it is possible to get a rather near object in focus without movement of the lens, provided it is not very near the centre of the field. When it is desired to obtain objects of a certain size on the plate, and to cover a plate of given size as sharply as may be towards the edges, then a lens of long focus will be selected; but, in this case, if near and distant objects are both included, one or other must give way in the matter of focus. When, on the other hand, actual size is not important, and it is desired to get objects at different distances all as nearly focussed as possible without diminishing the speed of the instrument, this will be accomplished by using a lens of short focus. The power of yielding a sufficiently magnified image may, however, as suggested before, be limited by the capability of the film of registering, without interference due to structure or coarseness of grain, details beyond a certain degree of fineness.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

WE have received from the Committee, through Mr. H. Harland, secretary, a request for the insertion of the subjoined report and statement of the future policy of the above-named Association: —

Your Committee, in submitting their Report for the past year, consider that it is desirable on the present occasion to give something more than the customary abstract of receipts and expenditure. It would be idle to contend that the Association has, at any period of its existence, completely fulfilled its mission, and the problem which has at several previous epochs of its history confronted its management has, during the past year, again presented itself and appealed for solution.

It will be within the knowledge of all but recent members that in 1885 the roll of membership had become reduced to such meagre dimensions that the Association became unworkable under the then existing system, and it was thereupon resolved to reduce the subscription to 2s. 6d. per annum, with a view to encourage the poorer members of the profession to join the Association. At the end of the following year the number of members had certainly increased, but the greater part of the increase consisted of persons who would never be likely to require assistance from the funds. At the Annual Meeting in 1887 two notable alterations were made in the Rules: —Amateurs were allowed to become members, and the Committee was empowered to consider applications for relief from non-members if the case had been recommended by a donor of £1 1s. Under the new conditions the number of members rapidly increased, but a vast majority of the increase consisted of amateurs, who were never likely to require aid, even if they were eligible to receive it; the class which the Association was designed to benefit still held aloof, and practically ignored its existence. One of the chief difficulties your Committee has to contend with is the fact that the good effected through the Association is of necessity very little known, those who receive benefit being, perhaps, naturally the last to talk about it. Many recently acquired members seemed to have taken a mere passing interest in our benevolent aims, and have suffered their subscriptions to fall into arrear, or, perhaps, have never really looked upon themselves as permanent subscribers at all. Owing to these circumstances the success of the Association has been materially hindered; and, although it will be recognised that this is no new difficulty, one of the first points your Committee had to determine was whether it was worth while, for the sake of a score of members who practically constitute the Association, to carry it on almost solely for their benefit? They have come to the conclusion that something more than this is expected from them, and that they should rather seek for powers to enable them to extend its scope and sphere of beneficence still further in the direction of such as have not hitherto been in a position to contribute to the funds. The old members, who have all been consulted on this point, are quite willing, for the general good, to sink their individual claims, and your Committee have now formulated a new set of rules embodying the principle on which they propose that the Association should in future be conducted. This, while reserving to old members a preferential claim on the funds, will afford a larger discretion in administering assistance to any deserving cases of distress, irrespective of membership, and will consequently give your Committee a better standpoint when appealing for funds for the general purposes of the Association. The serious attempt now for the first time made to initiate an independent Annuity Fund will be kept prominently in view, and it is with some confidence anticipated that it will before long very largely exceed the sum of £250, at which the new scheme will start it.

It has, from time to time, been brought as a reproach against the Association that the expenses of management have been too heavy in comparison with the amount expended in relief. Your Committee fully recognise the justice of this contention, and it has several times been considered whether the work might not be efficiently performed by an Hon. Secretary; but while they could reckon upon retaining the services of Mr. Harland, whose energy and experience have been of material service to them in the past, they have not thought it expedient to recommend so radical a change. Mr. Harland has, however, now seen fit to resign his office, and in response to an appeal which was thereupon inserted in the photographic papers, a gentleman has come forward and proffered his services as Honorary Secretary to the Association, and your Committee have, without hesitation, accepted his generous offer. They confidently trust that a new era in the affairs of the Association, marked by economy as well as efficiency of administration, will thus be ushered in, and they hope that the time is not far distant when the Association will take its proper position as the recognised channel for the benevolence of the profession.

Referring to the balance sheet for the past year, it will be seen that the funds show the substantial increase of £67 5s. 1d., and now stand at £375 12s. 11d. Members' subscriptions show a considerable falling off, being £20 19s., compared with £30 11s. for 1888; this has been already alluded to. The donations amounted to £71 18s. 5d., fully £10 more than in 1888, but of this sum £34 16s. 11d. was transferred from the abandoned Orphans' Fund. The exhibition of the P. S. G. B. produced £12 5s. 6d. against £14 3s. in 1888. The grants by way of relief, which in 1888 amounted to £38 14s., during the year under review amounted only to £18 4s., and this is the fact which has given your committee most reason for proposing to re-consider the position of the Association with a view to extending its sphere of usefulness; and the result of the long and anxious consideration they have given to the subject has been embodied in the new draft of rules which they now intend to submit for your approval.

A copy of the proposed new rules may be seen at the office of Mr. W. Benham, Hon. Solicitor to the Association, at 4, Great James Street, W.C.

THE CALCUTTA PHOTOGRAPHIC EXHIBITION.

THE *Journal of the Photographic Society of India* just received is full of interesting information. The best Photographic Exhibition ever held in Calcutta is over, and the judges who awarded the prizes were Sir Comer Petheram, Chief Justice; Col. Waterhouse; and Mr. W. H. Jobbins, Superintendent of the School of Art. The decision of the judges was not handed in before the close of the Exhibition, but the delay was unavoidable. Colonel Waterhouse did not return until after the Exhibition was open, and then, what with arrears of work and other calls upon his time, he was prevented from doing anything towards the judging until after Christmas week. By that time Sir Comer Petheram had gone to Darjeeling for the Christmas holidays, but he, at great personal inconvenience, came down to Calcutta and met Colonel Waterhouse and Mr. Jobbins at the Exhibition.

The following is an abridgment of the report of the judges, and contains the names of all the successful candidates: —

The special gold medal presented by His Highness the Bara Thakur Bahadur of Tipperah for the best platinotype by an amateur, irrespective of class or section, was awarded to Mr. F. M. Sutcliffe, for No. 164, and high commendation to his other pictures.

Class I.—Section 1 (Landscapes, Architecture, and Interiors). —Gold medal presented by Sir C. Petheram: Mr. R. Keene, for his series of landscapes and interiors. Society's silver medal: Mr. F. P. Cembrano. The award of an extra medal recommended to Mr. J. P. Gibson for his landscape views. Honorable mention: Messrs. Bourne and Shepherd, Bremner, Austin, J. S. Gladstone, Lala Deen Dyal, Pancoast, H. P. Robinson, Lyddell Sawyer, and Sutcliffe.—Section 2 (Portraits, Groups, and Studies).—Special medal, presented by H. E. the Viceroy: Messrs. Johnston and Hoffman. Society's gold medal: Mr. W. W. Winter, for "My Mammy," platinotype print. Society's silver medal recommended to Mr. Lyddell Sawyer,

Honorable mention: Messrs. J. E. Austin, G. M. Elton, J. P. Gibson, Robert Hotz, Kapp, Klier, Lala Deen Dyal, P. Nicholson, Lyddell Sawyer, Sutcliffe, and Miss Clarisse Miles.—Section 3 (Genre Pictures, Animals, and Still Life).—Gold medal, presented by H.H. the Maharajah of Kuch Behar: Mr. J. E. Austin, for his pictures of animals and studies. The Society's silver medal: Mr. R. S. Redfield. Extra medal recommended for the series of little wayside studies exhibited by Mr. M. H. Harding. Honorable mention: Messrs. D. Barnett, F. Bremner, Rev. F. C. Lambert, Miss Miles, Messrs, A. Nicholson, H. P. Robinson, F. M. Sutcliffe, and J. Walker.—Section 4 (Instantaneous Photographs).—Gold medal, presented by the Nawab of Dacca: Messrs. West and Sons, for photographs of yachts. The Society's silver medal: Mr. F. Bremner. Extra medal recommended to Mr. W. Parry for instantaneous views. Honorable mention: Messrs. C. R. Pancoast, Lyddell Sawyer, and Sutcliffe.—Section 5 (Combination Pictures).—Silver medal, presented by Col. J. Waterhouse: Mr. F. Whaley.—Section 6 (Stereoscopic Pictures).—Messrs. G. W. Wilson and Co.

Class III.—Section 12 (Photographs on Wood, Glass, Linen, or China).—Society's silver medal: Mr. Robert Hotz, for his porcelain pictures.—Section 13 (Reproductions and Enlargements).—Society's silver medal: Messrs. Kapp and Co., for group of the Naval Volunteers. Honorable mention: Messrs. Johnston and Hoffman, Messrs. Bourne and Shepherd, and Mr. Robert Hotz.

Class IV.—Section 14 (Miscellaneous Processes).—Certificate: Messrs. Kapp and Co.—Section 15 (Heliotype, Photo-Engraving, &c.).—Certificate: Mr. J. E. Dumont.—Section 16 (Photographs taken by Artificial Light).—Certificate: Mr. Robert Hotz.

INDIAN AMATEURS ONLY.

Class I.—Section 1 (Landscapes, Architecture, and Interiors).—Society's silver medal: Mr. E. W. Stoney. Extra medal recommended to Mr. T. D. La Touche. Honorable mention: Mr. G. J. Apcar, Mrs. Currie, Messrs. G. Ewing, S. J. Leslie, Col. Rogers, His Highness the Bara Thakur Bahadur of Tipperah—some of whose views in platinotype were specially commended—and Claude White, whose No. 18 was also of considerable excellence.—Section 2 (Portraits, Groups and Studies).—Society's silver medal: Mr. G. J. Apcar. The judges mentioned the general excellence of Mr. Apcar's pictures in this and other sections. Mr. Pope's group of survey officers, enlarged and printed in heliogravure, is deserving of notice, and some of the portraits exhibited by His Highness the Bara Thakur Bahadur of Tipperah are also good.—Section 3 (Genre Pictures, Animals, and Still Life).—Society's silver medal: Mr. A. G. E. Newland, whose pictures in this and other classes, though not so effective as they might be as photographs, show considerable originality and skilful grouping. Honorable mention: Messrs. Apcar and Stoney.—Section 4 (Instantaneous Photographs).—Society's silver medal: Mr. E. M. Showers. Honourable mention: Messrs. Apcar, Stoney, Newland, and Leslie.

Class II.—Section 8 (Micro-Photography).—Certificate: Mr. W. M. Osmond.

Class III.—Section 13 (Reproductions and Enlargements).—Society's silver medal: Mr. A. L. H. Palmer.

The awards for lantern slides are postponed until the pictures have been tried in the lantern.

THE ROYAL INSTITUTION.—Last Friday the first evening lecture of the session at the Royal Institution was delivered by Professor Dewar, with Sir Frederick Abel in the chair. The lecture dealt with the life and discoveries of Joule, and in the course of it Professor Dewar exhibited an experiment in which pieces of ice were melted by the heat produced by their friction against each other. They were rubbed against each other in the exhausted receiver of an air pump, and over strong sulphuric acid, two conditions by which water can be frozen, so that the melting was proved to be due to heat produced by friction, and not to the temperature of the theatre.

PHOTOGRAPHY IN SWEDEN.

IN the first number of the present year's issue of the Swedish *Photographic Journal for Professionals and Amateurs*, published at Stockholm, we meet with an interesting description of a reunion of the Photographic Society, communicated by the secretary, Alexis Hasselquist. The reunian was held on the 4th of January, 1879, and forty members of the Photographic Society attended. Dr. Wolff, the well-known astronomer from Heidelberg, honoured the assembly with his presence.

After Herr Palmgren, who presided at the meeting, had welcomed those ladies and gentlemen who were in the room, with suitable forms of speech, he took occasion to refer in terms betokening poignant regret to the great and grievous loss which the Society had lately suffered by the death of its former much-loved and well-esteemed president, Professor Herr Heymans.

Herr Palmgren then spoke in well-chosen phraseology, and at some length, of the important advantages which had been derived from photography by science, art, and industry, and added that photography's valued aid was by no means the least among the many aids which had of late years been offered to education. He was anxious those who were there present should know, and that by their means others interested in this matter might be given to understand, that photography in the hands of the amateur was no mere idle toy, insignificant plaything, or harmless amusement, but had its essential use and purpose in furthering the interest of the art student and the scientist, the physician and the astronomer.

The president concluded his speech, which was heard with the deepest attention, by a few interesting remarks about the rich and valuable collection of the products of photographic art which the members of the society saw before them, and might afterwards examine at their leisure.

Herr Roosval, the editor and publisher of the Swedish *Photographic Journal*, in succession to the president, addressed the meeting, and gave an account of the beginning of photography, of the early years, so to speak, of the art's childhood, when it was as yet scarcely able to walk alone. From this he passed to its present matured growth, speaking very highly, by the way, of the greatness of the art, and the noble inventions of our own time which had so much in them due to modern photography. His remarks were copiously illustrated by a large collection of Daguerreotypes, paper negatives, glass, and wax cloth pictures, which he said were fashionable in the year 1840 before paper pictures were invented. But the most interesting object in the whole collection for those assembled at this Swedish reunion was a Daguerreotype taken after nature at Copenhagen in 1840, for it represented the world-renowned sculptor Thorvaldsen. The plate, of the size of 18 by 24cm., was in excellent preservation, and is the property of the photographer, J. Jæger.

After the admission of many new members, and the transaction of the usual business of the Society, the visitors busied themselves with the inspection of the various objects of photographic interest which had been collected for their amusement.

Among the most noteworthy specimens of artistic work exhibited at this Swedish reunion may be mentioned several interiors and landscapes by Major Adelsköld; transparencies and landscapes by Doctor Aspelin; pictures from Panama by Herr Bowallius; heliogravures by Herr Börtzell; oil-coloured photographs and magnesium flash-light pictures by Herr Carleman; genre pictures by

Herr Cedergren; negative pictures of moon-eclipse and stars by Doctor Charlier; a rich collection of large photographs of the environs of Stockholm, also of places in Germany and Spain, by Professor Curman; instantaneous pictures by Herr Feychting; negative and positive pictures of star groups, lightning flashes, &c., by Professor Hasselberg; pictures from Gotland and Karlsöarne; interiors and enlargements on bromide of silver paper by Lieutenant Hasselquist; large panoramas from Stockholm and interiors, mostly taken with wet plates, by Herr Jæger, photographer; a few portraits taken thirty years ago by Herr Palmgren; some platinum pictures by Herr Roosval; landscape and pictures from Visby by Herr Stenquist; instantaneous pictures, taken with Stirn's camera, by Herr Strindberg; two photographs of pictures of Carl Larsson and Zorn, by Herr Ostlin; enlargements on bromide of silver paper, together with large and small landscapes, and instantaneous pictures of running horses, vessels under sail, &c., by Herr Blom; landscapes and genre pictures by Herr Carl Johansson; landscapes and instantaneous pictures of sea waves and breakers by Herr Kallstenius; photogravures by Herr Lagrelius; instantaneous pictures, landscapes, interiors, photographs of pictures and busts, with enlargements on bromide of silver paper, and photographs copied on aristo-paper by Herr Siljeström; and genre and instantaneous pictures of vessels under sail by Herr Smitt.

THE DISTANCE BEYOND WHICH ALL OBJECTS WILL BE IN FOCUS WITH ANY GIVEN LENS.*

BY SIR DAVID SALOMONS, BART.

THE author found a simple formula for ascertaining the distance beyond which all objects will be in focus with any given lens—it is $f + 100 f^2$ R inches—where f and R have the same meanings as usual. This formula is very useful to ascertain the most suitable lenses for detective cameras, and for other purposes. It is assumed that if points in the object are represented in the image by circles having diameters of $\frac{1}{100}$ inch and less, the picture will be sharp.

A special instance will be given to show its use:—$100 f^2$ R inches may be written $8\frac{1}{3} f^2$ R feet, since 100 inches = $8\frac{1}{3}$ feet. The addition of f in the formula may be neglected, being small compared with $100 f^2$ R. Most of the rapid landscape lenses work at $\frac{f}{8}$, so the formula reduces itself to f^2 feet approximately. This shows that, with any lens $\frac{f}{8}$, all will be in focus after a distance expressed by the square of its focal length in feet. Putting the formula in words, $100 f^2$ R inches reads:—100 multiplied by the ratio, multiplied by the square of the equivalent focal length of the lens, expresses in inches the distance beyond which all objects will appear in focus. To give an example:—After what distance will all objects be in focus with a lens stopped $\frac{f}{12}$ (*i.e.*, $\frac{1}{12}$), the equivalent focus being 10 inches?

Answer—

$100 \times \frac{1}{12} \times 10 \times 10 = \frac{10000}{12} = 833\frac{1}{3}$ inches = 69 feet $5\frac{1}{3}$ inches. To be strictly accurate, add f (= 10) to this, and distance becomes 70 feet $3\frac{1}{3}$ inches from optical centre of lens.

It is a good plan to mark the stops for the distance after which all will be in focus, as well as the standard number. In practice this is invaluable, for when a subject is to be taken requiring a particular stop to get the focus right, and it is found that this stop has a number requiring too long an exposure, a plate is saved.

* Read before the Photographic Society of Great Britain.

The following table will be found useful for many purposes: some 1,200 calculations having been made to compile the results given:—

FOCUS TABLE FOR DETECTIVE CAMERAS AND OTHER SPECIAL WORK.

Focus of lens in inches.	Decimal Standard Stop Numbers. 5	10	15	20	25	30	35	40	Ratio Marked on Stops. $\frac{f}{4}$	$\frac{f}{5}$	$\frac{f}{6}$	$\frac{f}{8}$	$\frac{f}{10}$	$\frac{f}{12}$	$\frac{f}{15}$	$\frac{f}{16}$	$\frac{f}{18}$	$\frac{f}{22}$	$\frac{f}{25}$	Focus of lens in inches.
	Numbers of feet and inches after which all in focus.								Number of feet and inches after which all in focus.											
4	19·4	13·8	11·5	9·10	8·9	8·0	7·5	7·0	19·4	17·0	15·1	13·8	12·5	11·5	10·7	9·10	9·2	8·8	8·2	7·8	7·4	7·0	4
4¼	21·10	15·4	12·10	11·1	9·10	9·0	8·4	7·10	21·10	19·2	17·0	15·4	14·0	12·10	11·10	11·1	10·4	9·9	9·2	8·8	8·3	7·10	4¼
4½	24·5	17·3	14·5	12·5	11·1	10·1	9·4	8·9	24·5	21·5	19·1	17·3	15·8	14·5	13·3	12·5	11·7	10·11	10·3	9·9	9·3	8·9	4½
4¾	27·3	19·2	16·0	13·9	12·4	11·3	10·5	9·9	27·3	23·10	21·3	19·2	17·5	16·0	14·10	13·9	12·11	12·1	11·5	10·10	10·3	9·9	4¾
5	30·2	21·3	17·9	15·3	13·7	12·5	11·6	10·10	30·2	26·5	23·6	21·3	19·4	17·9	16·5	15·3	14·3	13·5	12·8	11·11	11·4	10·10	5
5¼	33·3	23·4	19·6	16·10	15·0	13·9	12·8	11·11	33·3	29·1	25·11	23·4	21·3	19·6	18·1	16·10	15·9	14·9	13·11	13·2	12·6	11·11	5¼
5½	36·5	25·8	21·5	18·5	16·5	15·0	13·10	13·0	36·5	31·11	28·5	25·8	23·4	21·5	19·10	18·5	17·3	16·2	15·3	14·5	13·8	13·0	5½
5¾	39·10	28·0	23·5	20·1	17·11	16·5	15·2	14·3	39·10	34·11	31·1	28·0	25·6	23·5	21·8	20·1	18·10	17·8	16·8	15·9	14·11	14·3	5¾
6	43·4	30·6	25·6	21·11	19·6	17·8	16·6	15·6	43·4	38·0	33·10	30·6	27·9	25·6	23·6	21·11	20·6	19·3	18·1	17·2	16·3	15·6	6
6¼	47·0	33·0	27·7	23·9	21·2	19·4	17·10	16·9	47·0	41·2	36·8	33·0	30·1	27·7	25·6	23·9	22·2	20·10	19·8	18·7	17·7	16·9	6¼
6½	50·10	35·9	29·10	25·8	22·10	20·11	19·3	18·1	50·10	44·6	39·7	35·9	32·6	29·10	27·7	25·8	24·0	22·6	21·3	20·1	19·0	18·1	6½
6¾	54·9	38·6	32·2	27·8	24·8	22·6	20·9	19·6	54·9	48·0	42·9	38·6	35·0	32·2	29·9	27·8	25·10	24·3	22·10	21·7	20·6	19·6	6¾
7	58·11	41·5	34·7	29·9	26·6	24·3	22·4	21·0	58·11	51·7	45·11	41·5	37·8	34·7	31·11	29·9	27·9	26·1	24·7	23·3	22·0	21·0	7

Patent Intelligence.

Applications for Letters Patent.

964. W. C. CHIPPER, 39, Highgate Hill, London, "Camera Fittings."—January 20th.

1,098. H. H. LAKE, 45, Southampton Buildings, London, "Photographic Apparatus."—January 21st.

1,117. J. MASSIGNON and E. WATEL, 45, Southampton Buildings, London, "Manufacture of Bichromates."—January 21st.

1,115. W. R. BAKER, 9, Belmont Villas, Wallington, "Camera Stands."—January 22nd.

1,203. D. CARTER, 15, Gerrard Street, Warwick, "Cameras, Finder, and Shutter."—January 23rd.

1,267. W. T. WATSON, 20, Ocean Place, Hull, "Line or Grain-Effect for Photo-mechanical Printing."—January 24th.

Specifications Published.

1,543.—29*th January*, 1889. "Photographic Camera Shutters." WILLIAM JAMES LANCASTER, trading as J. Lancaster and Son, of Colmore Row, Birmingham, Manufacturing Optician.

This invention relates to photographic camera shutters, or apparatus for obtaining instantaneous or protracted exposure within certain limits, whereby light is allowed to pass momentarily, or otherwise as aforesaid, through the lens, or exposure aperture, at the will of the operator—thus, the shutter may be made to act instantaneously, or may be made to acquire varying speeds, according to the length of exposure required.

The apparatus consists, first, of a double shutter arrangement, which, for instantaneous exposure, acts in unison, but for protracted or varying exposure they act independently of each other; secondly, in shutter-holding means; thirdly, in shutter-releasing means; fourthly, in suspending and operating the shutters; fifthly, in clock or running-down mechanism, which operates a short arm, and removes the holding catch of the secondary shutter, after a period of time has elapsed since the raising of the primary shutter; sixthly, in time stop mechanism and other accessory parts in connection with the apparatus.

In carrying out my invention, I take a rectangular box-like frame, with an exposure aperture made through it; and sliding and working within guides contained within the said frame, I arrange two shutters, viz., a primary shutter and a secondary shutter, which alternately come in front of the exposure aperture.

The primary shutter works in juxtaposition to the inside back of the front of the enclosing casing, and with its upper end connected to the outer end of a flexible cord, whose inner end is connected to a hollow or box pulley, wherein a coiled spring is enclosed—this spring is the motive power for raising the shutter from before the aperture on exposure.

The primary shutter is held in position by a spring catch, working upon and through one side of the framing, in a manner that the bolt part of the said catch takes within a like notch or cut away part in the side of the shutter; so that on the shutter being lowered, or brought in front of the aperture, the catch is moved away by an incline, and then snaps into the notch.

The spring catch of the primary shutter is cranked at its lower end; and between it and the end of a releaser conducting tube, a small flexible bellows is enclosed; so that by pressing a pneumatic releaser, in the form of a flexible tube and ball, the bellows is expanded, and the catch taken out of action.

The secondary shutter works upon the back, or near the back of the primary one, and is held in position at two points, viz., on the side and at the top, whilst it is taken into its aperture covering position by a flat spring acting upon a stud; and further, it is taken into its raised position by the downward movement of the primary shutter, whose upper end is connected to that of the secondary one by a flexible cord passing over a pulley mounted at the upper end of the enclosing casing.

The side fastening is effected by a tumbler catch, in the form of a bell crank lever, with one arm directed vertically, and the other horizontally; and upon the latter, the time arm which is on the principal axis of the time mechanism comes, on the said mechanism having run down.

The upright or vertical arm carries a knife-edged catch or pivot, which engages with a side notch in the said shutter.

The secondary holding point of this said shutter consists of a spring catch, whose nose and inclined plane protrudes through the outer casing. This catch forms both a supplementary holder for the secondary shutter, and a buffer stop to the primary shutter.

The time mechanism, which consists of a barrel with a volute spring enclosed within it, a ratchet and pawl arrangement, a large toothed wheel gearing with a pinion on another axis, and which pinion axis carries a large toothed wheel, which gears with a second pinion on an axis which carries a third toothed wheel, which meshes with the teeth of a third pinion, and whose axis carries a fourth toothed wheel, with the teeth of which a knife edged stop engages, consisting of a fork-like arm pressed home by a spring, is arranged as aforesaid.

The axis which carries the drum, ratchet wheel, and primary tooth wheel as first named, is the same axis as carries the time arm. Thus, the moving of a turn carries on the said time arm axis through a portion of a circle, winds the spring up to an extent equivalent to a unit of time, which, when released, is allowed to run down only at a certain rate by the reduction gear or train of wheels as aforesaid.

The turn for giving varying speeds to the shutters, or rather to the secondary shutter, is provided with a pointer, which traverses in front of a graduated and set out dial, indicating one, two, three or more seconds, and portions of them.

The action of the apparatus or shutter for instantaneous exposure is as follows:—

The exposure aperture is covered by the pulling down of the primary shutter, which is held by its catch, while the secondary shutter is held by the top catch, which is the buffer stop to the primary one.

When the parts are in the positions as indicated—that is, the primary shutter down, and the secondary one up—the ball end of the pneumatic releaser is pressed, when the bellows at its other end is distended, and the spring catch released from the primary shutter, which now being free, is instantly drawn upwards, by the spring enclosed within the pulley, to which the flexible cord of the shutter is attached.

The rising and striking of the said shutter against the buffer stop catch liberates the said shutter, which is pressed down in front of the aperture by a spring.

For a greater exposure, the time required is fixed by placing the pointer in front of one of the markings on the dial, which determines the exposure required; this is done after the primary shutter has been brought before the aperture. Thus the primary shutter has been pulled down, and there held by its catch, and the secondary shutter pulled upwards, and held by the buffer stop catch; this done, the time for exposure is determined by moving the turn and pointer to the required position, when the secondary shutter holding stop carried by the bell-cranked arm passes into the notch on side of the said shutter, and holds it there.

The affixing of the shutter by the lower and side catch is done by a spring acting upon it when the time arm on the time axis mechanism is removed by the rotation of the turn and finger.

The pressing of the pneumatic releaser distends the bellows, removes the catch from the primary shutter, which is raised by the coiled spring from in front of the exposure aperture, and releases the buffer stop-catch from the secondary shutter, and also takes the knife-edged stop from the teeth of the top wheels of the train of wheels, which now being free, run down at a determinate rate, and bring the time-arm upon the top side of the horizontal arm of the bell crank catch, liberating the secondary shutter, which is now pressed down by the spring,

and comes in front of, and closes up light-tight, the exposure aperture.

It will be thus observed that the secondary plate follows the movement of the first one, after a certain definite period of time, and that the time-stop is released by the primary shutter coming against it.

1,439. *January 26th*, 1889. "Photographic Cameras." JOHN WILLIAM TURNER, Heathfield Street, Liverpool, Photographic Apparatus Manufacturer.

The invention relates to photographic detective or hand cameras, in which a number of dry sensitive plates are stored, are successively submitted to the action of light, and are then deposited in a suitable receptacle until they are required for development.

The object is to so make such cameras that the plates are readily and easily placed therein and removed therefrom, and are with certainty moved into the required positions by simple and efficient mechanism.

The invention consists essentially in providing first, rack or equivalent mechanism by which the plates are fed with certainty and regularity one after the other into position to receive the focussed image; and second, oscillating grippers by which the plates are removed from the focal centre and deposited in a container or receptacle.

A sliding rack operated by a pinion answers well to feed the plates forward intermittently. Each tooth of the rack acts on a plate, and springs are used to assist in moving the plates forward.

Grippers opened and closed by screw spring or equivalent mechanism, and moved in an arc by means of a handle or lever, are advantageously employed for removing the used plates into the container or receptacle.

12,860.—*August 14th*, 1889. "Optical Lanterns." ALFRED WRENCH, 50, Grays Inn Road, London, Manufacturing Optician.

This invention relates to improvements in or applicable to optical or magic-lanterns, whereby both mounted and unmounted slides can be more conveniently and easily exhibited than hitherto, the unmounted slides being automatically registered; by these improvements also a curtain or screen is operated between the exhibition of the slides as hereinafter more particularly described.

In carrying out my invention I form the lantern with two compartments in the stage or receptacle for the slides. One of these compartments is adapted for the reception of mounted slides, and the other compartment is provided with guides in which works a carrier operated by a rack-and-pinion or other arrangement, and adapted to receive and exhibit unmounted slides, and to register such slides automatically. The guides are furnished with spring-lugs, which yield to the upward pressure of the slide, and immediately it has passed them they spring outwards and hold the slide in position for being exhibited.

The said carrier also actuates a screen or shutter in such a manner as to produce the effect of a curtain falling after the exhibition of one slide, and rising to exhibit to view a new picture.

In a modification of my invention, I employ a shifting stage operated by a rack-and-pinion or other arrangement, whereby mounted slides and mechanical slides can be exhibited and registered automatically, in the same way as unmounted slides, and which shifting stage also actuates a screen or shutter to produce the curtain effect hereinbefore mentioned.

PHOTOGRAPHIC CLUB.—The subject for discussion on Feb. 5th will be "The Intensification and Reduction of Negatives"; and on Feb. 12th, "Illuminants for the Optical Lantern."

MESSRS. SMIB, CHURN, DUTT, & Co. seem to carry on a mixed kind of business. In their advertisement in *The Journal of the Photographic Society of India* the first column gives the prices of beers and wines in bottles, and the second column the prices of photographic apparatus. They also mention that they sell oilman's stores and provisions, hardware, and all sorts of tea and indigo garden implements.

Correspondence.

THE 1890 CAMERA CLUB CONFERENCE.

SIR,—I am requested by my Committee to ask your assistance in announcing the following outline of the Camera Club Conference for 1890:—

The 1890 Conference will be held in the Theatre of the Society of Arts (by kind permission of the Council) on Thursday and Friday, March 20th and 21st, under the Presidency of Capt. W. de W. Abney, C.B., R.E., F.R.S.

On Wednesday, March 19th, at 8.30 p.m., there will be a special Smoking Concert at the Club Rooms, and the Members' Annual Exhibition of Pictures will be opened.

On Thursday, March 20th, at 2 p.m., the President will open the Conference and Exhibition of Apparatus at the Society of Arts, and papers will be read from 2 to 5.30 p.m. In the evening a lantern slide exhibition will be given in the Theatre of the Society of Arts, for which special tickets may be obtained.

On Friday, March 21st, the apparatus will be on show from 10 a.m., and at 2 p.m. the Conference will be renewed.

At 7.30 the annual dinner for members and friends will take place.

A complete programme will be issued later and distributed. All photographers will be cordially invited to the Conference.

GEORGE DAVISON, *Hon. Sec.*

Camera Club, 21, Bedford Street, W.C., January 27th.

ISOCHROMATIC PHOTOGRAPHS AT THE FRENCH SOCIETY.

SIR,—We are glad to find that M. Vidal's error in supposing that the photographs on isochromatic and ordinary plates which we presented to the French Photographic Society were lighted in different ways was, as we surmised, simply owing to his want of knowledge in such matters. Had he been better acquainted with the isochromatic process as now employed in copying oil paintings, he would have been aware of the fact that the reflections from the rough surface of the canvas, which show so conspicuously in copies taken by the ordinary process, are usually scarcely noticeable in those taken on colour-sensitive plates. This is one of the peculiarities of the process, and is well recognized by those who practise it.

No alteration in the lighting is necessary to produce results such as we have shown, nor, in this instance, would such a thing have been possible, all the negatives being taken in the National Gallery from the paintings in the positions they occupy, and from which they are not allowed to be removed.

That our every-day results should be received with incredulity by experienced photographers says much for the capabilities of the process, and, except for the suggestion of unfairness which has been made, would have been perhaps the highest compliment we could receive.

We have forwarded to the President of the French Society conclusive evidence in support of our statements, and we shall now trust to M. Vidal's sense of honour and justice to aid us in removing the erroneous impression which seems to have prevailed with regard to the photographs presented by us to the Society.

B. J. EDWARDS & Co.

The Grove, Hackney, London.

CAMERA CLUB NOTICES.—Monday, February 3rd, 8 p.m.: Opening of Exhibition of photographs by members of the Amateur Photographic Field Club; 8.30 p.m.: smoking concert. Thursday, February 6th, 8 p.m.: Paper by Sir David Salomons, "Rule for ascertaining Size of Disc at a Given Distance for Lantern Work"; lantern exhibition of Dutch views by Messrs. Elder and W. A. Greene, and of slides by other members. Thursday, February 13th, 8 p.m.: Mr. Graham Balfour, "Landscape." Thursday, February 20th, 5 p.m.: Annual general meeting; 8 p.m.: Paper communicated by Mr. W. K. Burton, "On one or two of the Tenets of the 'Naturalists,'" with notes in reply by Mr. G. Davison. Thursday, February 27th, 8 p.m.: Dr. C. S. Patterson, "The Camera as Applied to Medicine." Monday, March 3rd, 8.30 p.m.: smoking concert.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the technical meeting of this Society held on the 28th inst., the chair was occupied by Mr. T. SEBASTIAN DAVIS.

Mr. CHAPMAN JONES read a short paper on "Marks on the Plate, due to the Hinges of the Dark Slides." He said that the effect of the near presence of the leather hinge was recognised as sometimes causing fogging, and sometimes a certain amount of insensitiveness. In a case that he had recently met with the effect seemed to be that of increasing the sensitiveness. He had had a plate in a dark slide for about four months, and upon exposing it late one dark afternoon he found the image to be very much under-exposed generally, but opposite the hinge of the dark slide the image appeared to have received two or three times as much exposure as the rest of the plate. The slide in question was one which had some time since been sent to the manufacturers, who had replaced the original leather hinge with one of a material that they now employed instead, and which was jean of a particular kind. They had adopted this material because of the fogging which had so often been complained of when leather was used. The manufacturers assured him that they had never found any evil effect to result from the use of this material, and this was so far confirmed by his own experience, that he had kept plates for two years in slides thus fitted without their sustaining any injury. It might be that instead of the hinge material conferring additional sensitiveness, the rest of the plate had lost that quality.

Mr. A. COWAN believed that the last suggestion was the real explanation of the case. It had been found by the late Mr. Collins that some kind of black—that mixed with oil—caused insensitiveness in the plates.

Mr. A. MACKIE said that turpentine black produced that result; the wood of which some slides were made also had the same effect. He treated such slides with melted paraffin.

Mr. COWAN showed some plates that he had exposed in illustration of the characteristics of a developer recently introduced in an American annual, consisting of 25 grains each of sodium sulphite and Rochelle salt, 2 grains of pyro, and 1 grain of lithium carbonate to the ounce. He expressed his opinion that this formula constituted an advance in pyrogallic development. He had tested it against the standard formula of 2 grains each of pyro and bromide, and 4 minims of ammonia to the ounce. The lithium-developed plate did not come up so rapidly at first as that developed with ammonia, but it afterwards overtook it, and would give a higher number on the sensitomer than could be got with the ammonia plate, unless the latter was so pushed as to lose the clearness of the shadows. It seemed to him that it was not necessary to confine oneself to Rochelle salt, as almost any organic salt of soda or potash appeared to have similar action. He had used acetate, phosphate, citrate, and valerianate with much the same result. He also showed a plate developed with pyro and one grain of lithium carbonate to the ounce without other addition, and this gave a very vigorous image. The use of ten times as much carbonate of potash in place of lithium gave a very weak image.

Mr. A. MACKIE said that Mr. Brooks used acetate of soda in the developer for collodio-bromide. He (Mr. Mackie) had tried it, but could not find that it made any difference.

Mr. W. E. DEBENHAM said that there was another use in Mr. Cowan's experiments, that is, in showing the great variations of density that could be obtained with the same plates and similar exposure. Were the plates used those of ordinary rapidity?

Mr. COWAN replied that they were, and gave 19 or 20 on Warnerke's sensitometer.

Mr. MACKIE, referring to a recent paper on intensifying, by Mr. Chapman Jones, asked the author whether he had tried the method of gaining intensity which consisted of applying a solution of sulphate of iron, slightly acid, before immersing the negative in the hypo bath.

Mr. CHAPMAN JONES thought that the method indicated resembled Mr. Howard Farmer's intensifying process. He had not tried it.

Mr. MACKIE did not think that there was any fresh deposit of silver, as an acid bath completely removed the density that had been gained by the use of the iron solution. As to reduction of intensity by the use of acid in cases where the sulphate of iron bath was not used, he thought that was due to the change of colour of deposit, and might therefore be considerable in the case of a negative developed with pyro, but not with one developed with ferrous oxalate.

Mr. CHAPMAN JONES said that a photographer of great experience had told him that he always reduced intensity by an acid bath, and that he developed with ferrous oxalate. He further stated that a negative originally too dense would become flat if left too long in the acid.

Mr. HOLLYER had never found that the acid bath made any difference in the density of negatives that had been developed with ferrous oxalate.

Mr. W. BEDFORD had found the same absence of reducing power upon negatives that had been developed with hydroquinone.

Mr. MACKIE had seen developed bromide prints reduced considerably by leaving some of the acid wash in them when placed in the hypo fixing solution.

Mr. DEBENHAM suggested that the difference of experience as to the reducing power of an acid bath upon negatives already of a grey or purplish colour might be due to the presence in some cases of a little iron in the acid used.

Mr. J. DESIRE ENGLAND wished to know why the yellow stain that occurred on pyro negatives, particularly when soda was used in development, and that was removed by acid, returned if the acid was thoroughly washed out.

Mr. MACKIE thought that the compound which showed itself as yellow stain was not removed by acid, but changed in colour, and that on the removal of all the acid the original yellow colour showed itself again.

The use of eikonogen as a developer was referred to, and some of the members spoke well of Mr. Warnerke's formula, in which it is used very strong; but Mr. Cowan thought that there was no advantage in using more than five or six grains of this substance to the ounce.

The CHAIRMAN had found great difficulty in getting density with eikonogen. He thought it very useful in practice to begin development with eikonogen, and when the details were well out, to add a solution of hydroquinone to the developer. A very superior quality of image was thus obtained, and density came easily.

Mr. MACKIE complained of the tendency of hydroquinone to start development at one place, and to get density there before the rest of the plate was developed.

Mr. CHAPMAN JONES never liked hydroquinone. He always got more stains with it than with any other developer.

Mr. COWAN said the large quantities of Rochelle salts and sulphite of soda used with lithium in the American formula answered equally well with eikonogen and hydroquinone, as it did with pyro.

THE CAMERA CLUB.

JANUARY 23rd, Bedford Street, Strand, London; the Rev. A. B. WHATTON, M.A., in the chair.

The Rev. T. PERKINS, M.A., read a paper on "English Church Architecture as a Subject for Photography," in the course of which he said that the man who is born an artist will produce artistic photographs, but no man who is not born an artist can be made one by means of rules. Even photographers who are not artists may make themselves useful by taking pictures of Church architecture, which pictures, after the lapse of time, may prove to be very valuable, for almost everywhere the "restorer" is at work destroying beautiful old buildings. He wished that they would erect new buildings instead, but spoiling old ones is cheaper, so memorials of them should be taken and preserved, ere it is too late. Whenever amateur photographers hear that a church in their neighbourhood is about to be restored, they should at once set to work to photograph the old one inside and out, and they should combine with this duty some study of architecture. Before 1018 most of the churches in this country

seem to have been built of wood ; at present only about a hundred of our churches built before the Conquest are to be found, and they represent Saxon work, after which came the Norman period. In photographing churches surrounded by other buildings, a suitable point of view is frequently obtainable from the south-east, and with a lens of moderately long focus, so as not to destroy the perspective, it is then sometimes possible to get in the tower ; people generally do not like to be buried on the north side of a church, hence the graveyard has a tendency to extend to the south-east. He deprecated the use of wide-angle lenses, unless the photographer were absolutely forced to use them ; even interiors were better if taken with narrow angle lenses at the cost of reducing the amount of subject included. He then projected upon the screen lantern pictures of a great number of British churches, including one of a church erected about the year 800 at Bradford-on-Avon, and now preserved as a national monument : he also gave an interesting and architectural description of each church represented.

The CHAIRMAN thought that if photographers gave attention to church architecture as recommended, they would not alone be doing good historical service, but their work might promote the art or science of architecture itself. Their work might also result in many churches being kept open on week days, instead of closed while the photographer went in search of a lazy verger. He had been told of one verger who was asked, "Do not people come sometimes out of service hours to this hallowed sanctuary, for peaceful meditation and silent prayer?" "Yes," replied the official, "I ketches 'em at it sometimes behind a pillar, and tells 'em service hours is eleven in the morning, and half past three in the afternoon." Vergers like that should be improved off the face of the earth.

Mr. GALE remarked that very few churches were built from the time of Henry VIII. to about the time of Wren, and he spoke of some points of resemblance between the towers of Somerset churches, as shown by Mr. Perkins's pictures, and others he had studied in Brittany.

Mr. J. S. WHATTON believed that there was a wooden church somewhere in the eastern suburban district of London, the name and situation of which he should much like to discover.

Mr. AVENT remarked that there was one at Greenstead, near Ongar.

Mr. DAVISON urged that all photographers of a practical bent should devote themselves to some connected work with a definite aim—as Mr. Perkins had done—but he maintained that such work, admirable in itself, led in quite a different direction from that in which the art student would find his development and prosecute his study. In regard to the City churches which had been mentioned, he drew attention to the good work done by Mr S. H. R. Salmon, of East Putney. In treating of the practical points raised, he stated that a lens of focal length equal to the longest side of the plate used, would not give a natural angle ; the perspective would be unnaturally violent.

On Thursday, February 6th, the lantern will be employed to exhibit some Dutch views by Messrs. Elder, W. A. Greene, and others ; some general subjects will also be shown.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 23rd inst., Mr. A. HADDON occupied the chair.

Mr F. P. CEMBRANO passed round a brass binder for lantern slides for use in place of paper strips. He also showed eight negatives, four of which had received a time camera exposure ; the others had been exposed in a hand camera with a quick shutter. Pyro and eikonogen with various alkalies were severally used for development, and similar set of developers was used for each set of exposures. A comparison of the results exhibited showed that for a time-exposure pyro, sulphite, and ammonia proved the best developer, but with the instantaneous exposures eikonogen, sulphite, and carbonate of soda gave the best negative.

Mr. W. H. PRESTWICH had tried eikonogen in comparison with pyro, using the same alkalies in each case ; he found no appreciable difference with either developer.

The CHAIRMAN remarked that eikonogen gave greater transparency in the shadows of a negative than the pyro developer.

Mr. CEMBRANO said that plates developed with eikonogen had a greater tendency to frill than when developed with pyro.

Mr W. E. DEBENHAM read a paper on "Selecting Focal Distance with Detective Cameras" (see page 87).

Mr. F. P. CEMBRANO said that it was not easy to determine whether a long or short focus lens was best for a hand camera. If only one class of work were required, then a lens could be chosen best suited for that work. Both long and short focus lenses had their advantages and disadvantages. He had been using a 6½-inch lens, but he believed a lens of about 5½-inch focus would be more generally useful. He considered that a short focus lens rendered distances more truly, and for general work was most useful ; on the other hand, if pictures of animals were wanted, then a long focus lens was to be preferred.

Mr. W. COLE thought that some means might be devised whereby the lenses of a hand camera could be changed quickly, either by a rotating front or a microscopic nose-piece.

Mr. P. EVERITT said that he held that the rule of using a lens the focus of which was double the length of the plate, applied equally to hand cameras ; this would give for a lantern picture about 5½ inches focus.

Mr. W. E. DEBENHAM said that when used in connexion with a fine film, the advantage lay on the side of a short focus lens ; better definition also was obtained with this lens. If the register were fixed for the principal object in the centre of the field, the curvature of the lens might prove an advantage from the shorter distance of objects on either side.

Mr. J. J. BRIGINSHAW remarked that it was unusual for the principal object of the picture to be placed in the centre.

Mr. P. EVERETT said that with a very round field, would the lecturer fix the register for the centre, or midway between the centre and side ?

Mr. DEBENHAM would fix the register to agree with the principal subject of interest in the picture.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

THE following have been elected as officers for the ensuing year : —*President*—Mr. J. Humphries, F.S.A.; *Vice-Presidents*—Messrs. H. Beckett, W. T. Goodhew ; *Curator*—Mr. F. Davall ; *Council*—Messrs. C. Beadle, F. Cherry, T. C. Lathbridge, W. A. Lavanchy, F. L. Pither, J. Saville, J. Steuart, H. Walker, E. T. Hiscock ; *Treasurer*—Mr. E. Seymour Paul ; *Hon. Sec.*—Mr. Geo. R. Martin, Harringay Park Granary, Green Lanes, Finsbury Park.

On Monday, January 27th, Mr. L. Medland gave a lecture entitled "In Northern Latitudes with a Camera," illustrated by lantern slides shown through the optical lantern ; the slides were made on collodio-bromide by himself, from negatives taken during his tour.

The following have been elected honorary members :—Messrs. S. Herbert Fry, Chas. W. Hastings, and E. F. C. Damaut.

On Monday, February 10th, Mr. Humphries will open a discussion on "Dark-room Illumination," and illustrate by several practical tests. Any photographer having lamps which they consider especially safe while giving a maximum of light, are invited to bring the same for the purpose of experiment.

WEST LONDON PHOTOGRAPHIC SOCIETY.

A MEETING was held at the Addison Hall on 24th January, Mr. CHARLES BILTON in the chair, when Messrs. Frogbrook and Eydmau were nominated for election ; after which the adjourned discussion upon hand cameras was proceeded with.

Mr. STEIN, in summing up his previous remarks, said a perfect detective camera must be unobtrusive in appearance, have some mechanical means of changing plates, and at the same time be as simple as possible ; the shutter must also be a good one, and work without jar or shake. In regard to the lens, he preferred one of short focus. With a 6-inch lens everything beyond thirty feet was in focus, but it was often necessary to get nearer to the object, and with a 3-inch lens everything beyond eight feet was practically sharp. He used in his de-

tective a 3¼-inch wide angle lens, by Wray, and found it worked well.

Mr. LESLEY SELBY, explaining the artist's hand camera, said that it could scarcely be called a detective, because it was not what Mr. Stein had called unobtrusive. However, all he wished to do with it was to get views, and for that work it answered admirably, as it could be very easily and quickly manipulated; moreover, it was light though strong, and would stand rough usage; he had taken it up Seawfell Pike without experiencing any fatigue.

The PRESIDENT announced that Mr. Wyndham Rickford and Mr. Garner Richardson had presented the Society with a lantern and screen, with accessories for using the limelight.

HACKNEY PHOTOGRAPHIC SOCIETY.

A MEETING was held on the 23rd inst., when the chair was occupied by Mr. GRANT.

Mr. HART gave a flash-light demonstration, and prefaced his demonstration by an interesting lecture on "Magnesium and its Use in Flash-Light Photography." Two groups were taken, with a dozen members in each; six lamps were used connected pneumatically. After the demonstration the lamp was described.

Mr. HADDLE then showed a neatly constructed detective camera of his own making. The weight was claimed to be less, and the camera more hidden, than the general run of "detectives," but the great novelty was a self-setting time and instantaneous shutter, which he had patented.

The SECRETARY announced that on the 27th February there would be an exhibition of apparatus.

Messrs. Barton and Reed were elected members.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A MEETING was held at the club rooms, Grand Hotel, Jan. 23.

The Chairman, Mr. E. H. JAQUES, announced that the president, Mr. J. B. Stone, J.P., had offered a prize for the best set of six views taken within a radius of ten miles round Birmingham.

Mr. GODFREE exhibited a very handy bichromate battery fo producing an electric light suitable for the developing room.

Dr. W. W. J. NICOL then gave his paper on "Iron Printing," which was illustrated with chemical experiments. Mention was made of the different forms of iron printing, the "dusting-on" and blue processes, sepiatype, platinotype, and particularly his new process, the "Kalotype." In this the paper is coated with—

Ferric oxalate	5 per cent.
Ferric tartrate	5 ,,

and in exposure the ferric salt is reduced to the ferrous salt, and is then developed with—

Potassic oxalate	10 per cent.
Nitrate of silver	1½ to 2 ,,
Ammonia	sufficient to clear.

The print is developed by floating the same as platinotype. It is then washed in three baths of—

Ammonia	1 ounce
Citrate of soda	¼ ,,
Water	1 gallon

The advantage claimed for this process is fixing without hypo, thus securing greater permanence.

THE BIRMINGHAM GEOLOGICAL SOCIETY.—Mr. W. J. Harrison, F.G.S., the Science Demonstrator of the Birmingham School Board, has just received intimation from the Secretary of the Geological Society that the Council have awarded him the proceeds of the "Barlow-Jameson Fund," in recognition of his "valuable contributions to geological science," and he is invited to attend the anniversary meeting of the Society on 21st February next to receive the award. The former recipients of the "Barlow-Jameson Fund" were, in 1882, Dr. James Croll; 1884, Baron von Ettingshausen; 1886, Professor Leo Lesquereux; and in 1888, Dr. Johnston-Lavis. The income of the fund is "to be applied every two or three years, as may be approved by the Council, to or for the advancement of geological science."—*Birmingham Daily Post.*

Answers to Correspondents.

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

PHOTARGUS.—We sympathise with you in your desire to find fairly good water in your island home. For the better purposes, such as the removal of the silver nitrate and last washing of your finished prints, it would seem necessary to use distilled water, the preparation of which is tedious rather than difficult, and there are now several kinds of tin stills to choose from. Instead of using permanganate of potash, which will only remove organic matter, and none of the saline impurities, we should advise you to rely upon a prolonged washing in frequent changes of well water, and then finally remove these soluble salts from the paper by distilled water. The use of permanganate as a test for hypo yet remaining in albumenized prints does not work satisfactorily, because of its ultimate reduction by the albumen. How do you manage to get drinking water on the island; and have you any trouble in finishing off your gelatine negatives?

C. E. E.—The Key camera was exhibited last summer at the St. James's Hall meeting of the Photographic Convention. For a description of it see the NEWS of August 30th last, "Convention Notes," p. 573.

A. and G. T.—The cards are of exceptionally good quality, and there is no bronze powder in the printing ink. Those not used (three) are returned to you by post.

OLD HAND.—Dextro-maltose is very soluble in water, and may answer your purpose. Enquire of the Maubrè Saccharine Company, Hammersmith, W.

W. T. D.—Would like to communicate with Mr. Frederick Winterhoff, who took out a patent last year for a "Process of etching and engraving on glass." The address given in the specification is reported to be merely London, Middlesex. Can any of our correspondents oblige us by furnishing the desired information as to present address?

PHOTOGRAPHER.—Slow toning of ready-sensitized paper. See reply to J. A. R. last week, and try the effect of a last washing with very dilute ammonia before toning. Having tried without success the carbonate and borax toning baths, it might be well to experiment with the tungstate or with the very active chloride of lime toning bath, as prescribed at page 202 of the YEAR-BOOK. Two grains of gold per sheet ought to be amply sufficient.

FLUX.—Reduction of silver residues. The chloride and sulphide precipitates had better be treated separately. For the first, dry well and mix with an equal weight of carbonate of soda, and project this mixture, by small portions at a time, into a clay crucible containing fused carbonates of potash and soda. As oxygen and carbonic acid are given off, be on your guard against loss by frothing. When all is introduced, allow time for tranquil fusion, let cool, and break the crucible to extract the lump or button of pure silver. Gold residues are treated in the same way, but the metal usually contains a little silver, and sometimes enough to whiten the alloy. Paper ashes are also treated like the chloride, but in a more capacious crucible, to provide for lively effervescence. The sulphide of silver residues had better be roasted to get rid of much sulphur, then fused with dry carbonate of soda, and occasional addition of nitre to burn off the rest of the sulphur. Proceed cautiously for fear of the action becoming too violent. Some operators add, finally, a little dry borax, which helps to refine the metal.

T. M. K. (Jersey).—Studio construction. Your sketch gives only the end view of proposed iron building, without details of sides and roof. The window 12 by 6 feet ought to be placed horizontally instead of vertically, for it would be of no use carried down so low to the ground. Why not avail yourself of the full width of the gable wall, and so get more light? You have not indicated the aspect, or given sufficient data to enable us to advise you on several points; in fact, the sketch is altogether too rough to properly represent your ideas.

F. GOW.—Shall we return your money, or send out collotype prints to the value?

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1640.—*February* 7, 1890.

CONTENTS.

LIGHTS FROM EXPLOSIONS OR DETONATIONS.

A GREAT point in taking photographs by bright flashes of light of short duration is, that those flashes shall be short enough to obtain the portrait before the sitter has time to move or to blink his eyes; what he does after the illumination is over is of no moment. In a large proportion of the flash-light photographs from various sources which have been publicly exhibited, the curious appearance of the eyes of the sitters is usually noteworthy, more especially in groups. Excellent flash-light photographs taken in their own homes of single sitters are easily obtainable by giving the subject a book to read, so that the eyelids are naturally somewhat drawn down. In a group of half-a-dozen sitters this plan does not answer, for rarely in real life are so many persons seen all desperately studious at once, and the smirk and other expressions on the countenances of some of them reveal obviously that they are not reading, but being photographed, so the whole picture is grotesque. Single sitters can be trained to steadiness of the eyes under the flash light, but the professional photographer does not desire to use up plates or to give the time necessary for the educating process.

Explosive mixtures containing magnesium were largely experimented with some two or three years ago, to overcome this difficulty, and good compounds effected their object in this respect. They now seem to have been generally abandoned, in this country at least, because of their danger, and some frightful accidents have occurred in consequence of their commercial introduction in other lands than ours. Chlorate of potash is usually the oxygen-imparting substance in such powders, and our Government, fortunately, will not give permission for the sale of any explosive containing chlorate of potash. The would-be introducers of such a new explosive once complained at a meeting of the Society of Chemical Industry of this action of the Government, whose officials had said that the mixture would explode under the glancing blow of a broomstick on a floor. The complainant then industriously hammered away with a wooden mallet at some of it placed on a wooden anvil, and no explosion resulted. Dr. Debus, who was present, quietly remarked that the operator had been careful to strike along and not across the grain of the wood of the anvil. He added that explosives were like horses; they knew when they had a good rider, and might be safe enough in the hands of their scientific advocates. The Government, however, had the duty of considering the safety of the lives of the poor and ignorant who might have to use them.

Our idea is, that the trial of such explosives in photography has been prematurely abandoned, because the materials ordinarily used in them are safe enough when kept in powder in separate bottles, and when a few grains of explosive mixture are wanted, that small quantity alone may be prepared immediately before using, and gently mixed with the feather end of a quill pen. An objection to the light produced by the explosion is that it is small and star-like, therefore throws harsh shadows. Another objection is that the smoke is thrown out at the moment tolerably equally in all directions, so obscures some of the light. Magnesium, however, is now so cheap, that the latter objection is of small importance, even if it be not overcome.

To diffuse the light, suitable translucent screens and suitable reflectors have been used, but with these the percentage of light lost is heavy. The better way of overcoming the difficulty seems to be to fire off several of the little charges at once by means of electricity, so that the light shall come from several different points. The late Mr. Donkin suggested the use of a galvanic battery, to send a current through minute lengths of platinum wire wherever the powder was placed, so that the powder charges should be ignited by the lengths becoming red hot. A simpler and much cheaper method seems to us to be, igniting them by means of a Wimshursts electrical machine, arranged to give sparks at will between disconnected parts of an otherwise complete metallic circuit. Some explosive powders such sparks will scatter and not ignite, but placing a piece of wet string in the circuit usually overcomes this difficulty.

THE ROYAL INSTITUTION.

V.

Dr. Thomas Young's Discoveries and Photographs. The researches and discoveries of Dr. Thomas Young next claim attention. He was one of the early photographers, and held an appointment at the Royal Institution when, in 1802, Wedgwood made known his discoveries there, and Davy took the first micro-photographs. Young was born at Milverton, in Somersetshire, on the 13th of June, 1773, and his parents were members of the Society of Friends. In March, 1872, he was sent to a private school at Compton, in Dorsetshire, and at the age of fourteen was appointed tutor at Youngsbury, near Ware, to Hudson Gurney, grandson of Mr. Barclay. His medical studies began in 1792; he made rapid progress, and after a time he proved why the eye can see distinctly at different distances—namely, "by the alteration of the curvature of the crystalline lens," and his memoir on this subject appeared in the "Philosophical Transactions" of the Royal Society, of which Society he was next year elected a member. Subsequently he continued his medical studies at Edinburgh, and afterwards spent some time in the Highlands, visiting members of the Scottish aristocracy. In 1879 he went to the University of Gottingen to pursue his medical studies, and subsequently received there his degree as doctor of physic, surgery, and midwifery. At Brunswick he was presented at Court, clothed in other than Quaker costume, and he travelled a little in Germany. On his return to England he became a fellow-commoner of Emanuel College, Cambridge, and when he was about thirty years of age began the practice of medicine.

Huyghens first broached the wave theory of light, but the great authority of Newton, who had adopted the emission theory, and considered that light consisted of small particles thrown out with immense velocity by the luminous body, bore down all opponents, so that the emission theory was then most believed in by scientific men. Young favoured the undulatory theory, and on the 16th of January, 1800, sent in to the Royal Society a paper entitled, "Outlines and Experiments respecting Sound and Light." In it he points out some difficulties in the emission theory. The first is the uniform velocity with which light is supposed to be projected from all luminous bodies. How is it, he asks, that whether the projecting force be electricity, the friction of two pebbles, the lowest degree of visible ignition, the white heat of a blast furnace, or the intense heat of the sun itself, these wonderful corpuscles are always projected through the same medium with uniform velocity? Another objection which he urged was the partial reflection from every refracting surface. One of Newton's objections to the wave theory was, that waves, say of water, will go round any opposing obstacle, such as a rock, and be found behind it as well as before. Young's argument was that, "in a medium so highly elastic as the luminous ether must be supposed to be, the tendency to diverge may be considered infinitely small," an explanation now known to be the true one. Lord Brougham also opposed Young's arguments, and abused him unmercifully.

Wedgwood's photographic discoveries were made known at the Royal Institution in 1802, so it may be well here to restate a fact or two, and to show what men of science were engaged on the premises at the time, and we state the position in the words of Professor Tyndall, who says: "The Royal Institution was founded by Count Rumford, supported by many of the foremost men in England. The King was its patron, the Earl of Winchilsea its first president, while Lord Morton, Lord Egremont, and Sir Joseph Banks were its vice-presidents. On the 13th of January, 1800, the Royal Seal was attached to the charter of the Royal Institution. Dr. Thomas Garnet was appointed Professor of Natural Philosophy and Chemistry. During his previous residence in Bavaria, Rumford had ruled with beneficent but despotic sway, and the habit of mind thus engendered may have made itself felt in his behaviour to Dr. Garnet. At all events, they did not get on well together. On the 16th Febuary, 1801, Davy was appointed Assistant Lecturer in Chemistry, Director of the Chemical Laboratory, and Assistant Editor of the Journals of the Institution. The post of Professor of Natural Philosophy was offered to Young, and he accepted it. The salary was to be £300 a year. On the 3rd of August, 1801, the following resolution was passed:—'Resolved that the Managers approve of the measures taken by Count Rumford, and that the appointment of Dr. Young be confirmed.'"

One of the best proofs ever given of the wave theory of light was advanced by Young. Suppose two stones to be dropped at some distance apart into a pond, each stone will send out rings of waves, and the two series of water-waves will meet. If the elevations of one series of waves then tend to coincide in position with the elevations of the other series of waves, increased wave motion will be the result of their meeting; but if the depressions of the one series of waves tend to coincide with the elevations of the other series, as in the accompanying cut, the two actions will neutralize

each other, and still water is the result. So, argued Young, should it be with light; it ought to be possible, by mixing two lights of the same wave-length, to produce stillness or darkness. This can be done experimentally. If two beams of monochromatic light—say the pure red of the spectrum—are made to fall upon each other at a narrow angle, instead of producing an area of unbroken red light upon the screen, the arrangement, when properly made, gives alternate bands of red light and darkness upon the screen, the darkness being due to two series of waves of light neutralizing each other. Young called this "the general law of the interference of light."

(*To be continued*).

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

STELLAR-PHOTOGRAPHY—LITHO-PHOTOGRAVURE—GELATINE PLATES FOR PHOTO-MECHANICAL PURPOSES.

Stellar-Photography.—One of the most talented and ardent amateur astronomers in this country, Mr. Eugen von Gothard, of Herény, Hungary, has of late produced a number of highly interesting photographs of nebulæ. These beautiful pictures show that it is possible, with comparatively very limited instrumental resources, by the aid of photography, to obtain results which by far surpass what has been gained even with the largest instruments by means of ocular observations. E. von Gothard possesses a ten-inch reflecting telescope of a comparatively short focus (about six feet). Reflecting telescopes are, however, in the case of stellar photography, in many instances superior to the refractors, since, with the former, light-waves of every wave-length are united in one point; whilst with refractors each sort of ray possesses a different focus. With reflecting telescopes it is, therefore, also possible advantageously to make use of orthochromatic plates. The renowned astronomer, Professor H. C. Vogel, of Potsdam, has of late published enlarged lithographic reproductions of some of the photographs of M. Gothard, rendering most exactly the photographic originals, showing, however, at the same time, much more detail than the drawings produced after direct ocular observations. Vogel speaks very highly of these photographs. Especially beautiful is one photograph of the well-known spiral nebula in the "Hunters," which has been taken with an exposure of two hours and thirty-five minutes. It is remarkable that this picture admits a strict discernment between light-knots—*i.e.*, stellar-like condensations in the nebulosity—and stars, the silver deposit on the negative, if examined at high powers, being a materially different one in the case of a star, than in the case of a light-knot. With regard to the very remarkable success with which this photograph of the nebula has been achieved, Prof. Vogel recommends a very special study of it by means of exposures of different lengths of time. Not only that with shorter exposures, by which only the brightest parts of the nebula will be apparent, and exact measuring of their position will be possible, but also a photographic determination of the relative intensities of the different parts of the nebula will be given by a number of differently long-exposed plates. It will be remembered that in stellar photography the inferior rapidity of the instrument is compensated for by a longer time of exposure, which enables the rendering of objects which are too feeble to affect the eye.

Litho-Photogravure.—Herr Ottomar Volckmer, chairman of the Photographic Society of Vienna, gives in the *Correspondenz* an interesting description of a peculiar, very perfect photo-mechanical process, which has been invented by his friend Carl Eckstein, of the staff at the Hague. At first, a lithographic stone of the finest quality is polished with oxalic acid and water, and then covered by means of a roller very evenly with a very diluted asphaltum solution, which is prepared by boiling five parts of asphaltum, six parts of white wax, six parts of stearine, adding to it two parts of soda solution, dissolving the whole, after cooling, in turpentine oil, filtering, and keeping in well-stoppered bottles. Into the thin, light-brownish film are now, by means of a diamond with the ruling machine, scratched very fine lines, from eight to ten to one millimetre (1-26th of an inch), until the stone is all over evenly covered with them. The latter is then provided with a wax border one-fifth of an inch high, and well levelled within a trough. An etching liquid is now poured over the stone, consisting of one-sixth part of chemically pure nitric acid, six parts of alcohol of 36°, and 350 parts of distilled water. After half-a-minute the stone is quickly washed, dried, oiled, the asphaltum washed off with turpentine, and then inked up; it is then ready for being printed from, and forms the so-called mother-stone. Now, one or a number of transfers are made from it on a well-polished, and afterwards with oxalic acid repolished stone, by slightly moistening the back of the print on the transfer paper, squeegeeing it on to the stone, and, when almost dry, by treating it with warm water, until the paper comes off. After well washing with warm water, other transfers can be applied to the same stone, so that the lines cross themselves with the former ones from one to four times. The latter is especially to be recommended for litho-photogravure work. The stone is then dusted with finest resin powder, the surplus removed by means of a camel's hair brush, and the resin melted on to the transfer by ether vapours. A carbon transparency on glass is now produced from a good, clear negative, ordinary pigment paper exposed behind it, slightly moistened, squeegeed on to the ruled stone, and developed with water of 104° to 113° F., until the paper, and afterwards the excessive colour, by constantly rocking the stone in warm water, begins to loosen. The picture is now a negative copy. The stone should then be dried spontaneously with care, which requires from five to six hours. The etching is done with ferric chloride of 40·37° F., 33° and 30° Beaumé, respectively, beginning with 40° and finishing with 30°. This requires skill and practice. The strong solution etches at first through the thinnest parts of the relief, after some time also through the thick ones. The etching fluid of 30° dissolves at last in its water the whole of the pigment film still remaining. As soon as the required depth of etching is attained, the stone is removed to a trough and thoroughly washed in running water, then the asphalt is washed off with turpentine, washed again in several changes of water, and dried. The image is now deeply etched in the stone. Finally, it is oiled, inked up, and treated otherwise as any other engraved stone. Should it be desired to print from the stone in more than one colour, it is at first inked with a local tone—grey, violet, or brown—according to the required character of the picture, and then by marking out the other parts. The single colours are imposed upon the ground tone. A very slight touch will deposit a sufficient amount of colour. As soon as the different colours have been applied, a print can be made at once. The colour effect is excellent.

Gelatine Plates for Photo-Mechanical Purposes.—It is generally known that negatives which are to be used for photographic transfers from line subjects should show the lines quite clear, and the rest of the film very dense and opaque. Many operators suppose that gelatine dry plates are not at all applicable for this purpose, and, therefore, prefer the wet collodion process, which they find to be the best for producing such negatives. Gelatine plates are, however, by no means quite useless for this class of work, for, without mentioning that there are a few manufacturers who produce a sort of slow gelatine plate which gives satisfactory results, there is no doubt that also

ordinary gelatine dry plates may successfully be employed for photo-mechanical work, provided they are correctly treated. In the case of reproductions from drawings and other line subjects, clearness, and especially vigour, is obtained more easily and with more certainty, without intensifying, than with collodion plates, if the following method, as recommended by Herr F. Wilde, be employed:—The plate is exposed twice as long as would be required for ordinary photographs, and to the developing solution is added from the beginning the following iodo-bromide restrainer, in the proportion of 20cc. to 25cc. to each 200cc. of developer.

Solution 1.

Iodine, sublimed	1 gramme
Alcohol	200 cc.

Solution 2.

Potassium bromide	14 grammes
Water	200 cc.

Solutions one and two are mixed, and the mixture is added to the developer in the above given proportion. By prolonged development negatives of such a vigour and density may be obtained, as are very difficult and not always with equal certainty obtainable on wet collodion plates, even with subsequent intensification. If these directions are carefully observed, the gelatine dry plates are decidedly preferable to the wet collodion plates for this special purpose.

THE RETOUCHER'S POINT.

BY JENNIE R. SKIDMORE.

I WATCHED her pencil glide about,
I also watched the hand that hid it,
I paused a moment, half in doubt,
Then boldly asked her how she did it.

She laughed, and gave a gay retort,
As still her fingers kept their pace,
Yet while she crushed my heart in sport,
She deftly rounded out my face.

And cleared my brow of every care,
And put such fire within my eyes!
And squared my chin and smoothed my hair—
I gazed upon her in surprise.

And when 'twas done, I said to her,
"An easy thing 'twould be to live
If shown by some philosopher
That Life is like a Negative."

Then, smiling, cried the pretty maid:
"I'll prove it to you very pat;
There's naught in life but 'light' and 'shade,'
Though sometimes we pronounce it 'flat.'"

"And then again we find it 'sharp,'
Or 'blank' or 'clouded'—men have rhymed
Of youths the gods take to their heart,
And then you see its 'under-timed.'"

"And then—" "I yield the palm to you;
Your doctrine's sound at every joint."
She tossed her head—"That's nothing new;
Retouchers often make a point."

American Times.

PHOTOGRAPHING A DUEL.—A correspondent of the *New York Herald*, in an account of the recent duel between the Marquis de Mores and M. Camille Dreyfus, says:—"I stood a few dozen yards away watching every detail, and from time to time taking instantaneous photographs with the aid of a detective camera stowed beneath my waistcoat. These photographs will be reproduced in the *Herald* within a few days."

ON CONTROL IN THE DENSITY OF NEGATIVES.*

BY CHAPMAN JONES, F.I.C., F.C.S.

IT is universally allowed that the practical density of the deposit obtained in a gelatino-bromide negative is difficult to estimate during development, probably on account of the variable printing value of negatives that have the same apparent densities, and certainly because of the opacity of the film. This last difficulty is increased when the sensitive salt is in suitable quantity to prevent light passing through the film, so as to make the best possible gradation, and avoid the evils of halation.

The photographer who aims at something higher than to simply take what comes on his plate and make the best of it in printing, has a choice of three principles of action in controlling the densities of his negatives. He may get as close as he can to the desirable condition by development, and trust to processes of reduction if his plate is too dense, and to intensification if it is not dense enough; or he may get density at all risks, and endeavour if necessary to reduce his negatives to what he wants; or, lastly, he may take care that the density got by development shall never be too great, so that the error may be corrected by intensification alone. Each method has its advocates, and is doubtless occasionally useful; but the amount of control obtained by the usual processes is so small, and the uncertainty of the various operations so great, that many expert workers prefer to either print from or else altogether reject their negatives as produced by simple development. It is the aim of the author to do away with this uncertainty, and to show how—what is for all practical purposes—a perfect control may be realised in the densities of negatives.

It has been shown by Captain Abney that in all probability the amount of silver deposited in a film by development, after exposures within the ordinary limits, is proportional to the actinic power of the light acting upon the sensitive salt, though the opacity is not strictly proportional. It will be convenient to speak of the gradation in such a negative as "normal." In methods for altering the densities of negatives it is important that the gradation shall remain normal, being either increased or diminished throughout the scale in a proportional manner. An alteration of the gradation may sometimes be good, but it will be allowed by all that a standard process working with exactness is desirable, if only as a point from which departures may be made.

In seeking for methods by which the control of density may be obtained without destroying the normal character of the gradation, it is necessary to remember the very appreciable thickness of the sensitive film, and that in almost every case the reagent employed begins to act at its outer surface. This demonstrates at once that to get with certainty a normal alteration of density, the changes produced must be such as may be allowed to work thoroughly and through the film. A thorough reduction by any of the usual processes would lead to a complete removal of the image, and methods of reduction are, therefore, useless for the normal control of density. It may, perhaps, be possible, by employing a very dilute reducing solution, to get the reagent to work so slowly that it penetrates the film before it appreciably acts, and so by beginning to produce its effect on the whole image at the same time, to work normally; but there can be no guarantee that the action is not irregular. It may, perhaps, in a somewhat similar manner, be possible to get a normal intensification by the use of a reagent that first intensifies and then reduces, but in practical work it is not possible to be sure that the reducing effect has not begun at the surface before the intensification has reached its maximum in the high lights that extend deep into the film. Such irregular processes may have their uses, in which their characteristic irregularities are taken advantage of, but as standard methods of work in which certainty is important, they can only be regarded as treacherous and unsuitable.

It remains, therefore, in getting control of density with certainty, and without producing abnormal results, to take care that the negative as developed is not too dense, and to seek for methods of intensification that shall give increase of density in

* Read before the Photographic Society of Great Britain.

easy stages, and are free from the faults above-named. Taking into consideration also such matters as permanency of result, it appears that, by the use of mercuric chloride, sodium sulphite, and ferrous oxalate, in the manner hereafter described, the control sought for may be realized.

It will be convenient to consider the subject under the following divisions :—Historical references ; chemistry of the changes ; action of mercuric chloride ; action of sodium sulphite ; action of ferrous oxalate ; practical methods.

Historical References.—In a letter addressed to the editor of the Photographic News, in 1878, Mr. J. W. Swan stated that "ferrous oxalate advantageously replaces the nitrate of silver, Schlippe's salts, or other of the chemicals now commonly used for blackening the image after treatment with bromide of copper." In 1881, Messrs. C. I. Burton and A. P. Laurie described before the Edinburgh Photographic Society (Photographic News, XXV., 269) some experiments with intensifiers. After bleaching with mercuric chloride, they sought to blacken the negative by exposure to light, and failed. They therefore used mercuric bromide in saturated solution instead of the chloride, washed the plate, exposed it to sunshine for about a minute at least—the longer the better—and then applied a developer. They preferred ferrous oxalate as developer, but stated that pyrogallic acid was also serviceable. They found that the process might be repeated several times on the same negative. Scolik's method of intensification by treatment with mercuric chloride or bromide followed by sodium sulphite, was introduced in 1884 (*Photographische Correspondenz*, XXI., 265), and Dr. Eder, in the Year-Book of Photography for 1885 (page 100), states that "the white and insoluble mercurous chloride which is deposited upon the plate is rapidly reduced to the metallic state by the sulphite." He says, in addition, that mercury forms a stable image.

Chemistry of the Changes : The Action of Mercuric Chloride.—As mercuric chloride is the first reagent employed, it appeared to be important to discover the change that it brings about. It is generally stated that when mercuric chloride reacts with the silver of the image, silver chloride and mercurous chloride result.

$$Ag + HgCl_2 = HgCl + AgCl.$$

As I have not been able to find any record of a specific proof of the truth of this reaction, I treated a quantity of pure precipitated silver by grinding it with mercuric chloride and water, and repeating the grinding at intervals during a few days. The product was washed, and consisted chiefly of a pure, white powder, but mixed with a coarse, grey powder of probably unacted-on silver. As much of the white product as was deemed advisable was separated by elutriation, dried at steam heat, and found analytically to contain 37·75 per cent. of silver chloride, the amount needed by the above equation being 37·86 per cent. This result was confirmed by other methods, such as the quantity of mercury salt taken up, and the weight of product obtained from a given weight of silver ; therefore there is no room for doubt that the commonly accepted reaction is correct so far as the matter of proportion goes. The properties of the product, however, both chemical and physical, point to the conclusion that it is not a *mixture* of the two chlorides, but a definite double chloride. This matter is still under investigation, but, acting in the light of evidence already to hand, I will, for present purposes, regard the substance as a definite compound, writing the equation that represents its production—

$$Ag + HgCl_2 = HgAgCl_2,$$

and postpone any further consideration of the matter.

The Action of Sodium Sulphite.—The action of sodium sulphite upon mercurous silver chloride is commonly stated to result in the solution of the silver chloride and the reduction of the mercurous chloride to the metallic state. This I believe to be entirely incorrect, though there appears to be sufficient ground for having provisionally accepted the idea. In the quotation given above from Dr. Eder, one would naturally infer that this was the change, and test-books of chemistry very commonly state that sodium sulphite reduces mercurous chloride to the metal. It is also well known that silver chloride is dissolved by sodium sulphite. But the reaction before us is not equal to the result of the action of sodium sulphite upon mercurous chloride and silver chloride separately ; the silver is not dissolved, the mercury is not reduced, and the sodium sulphite apparently does not play the part of a reducing agent.

Concerning the action of sodium sulphite on silver chloride alone, there is little that calls for remark. The silver chloride is dissolved, and there seems no reason to doubt the commonly accepted statement that a double sulphite is produced, or perhaps more than one.

The action of sodium sulphite upon mercurous chloride has been studied conjointly by Dr. Divers and Mr. Schmidzu (*Journal of the Chemical Society*, XLIX, 533). They found that there was at first a transient blackening due to the formation of what they call hypomercurosic sulphite, and formulate thus : — $Hg(SO_3)_2Hg_3$. This formula halved and written empirically becomes identical with mercurous sulphite, Hg_2SO_3, and there appears to be no conclusive reason why the production of this compound should not be expressed by the simple equation $2HgCl + Na_2So_3 = Hg_2SO_3 + 2NaCl$. But excess of sodium sulphite so readily attacks the mercury salt that it cannot be prepared by taking any precautions from mercurous chloride, the final products of the change being mercuric sodium sulphite, which dissolves, and a residue of metallic mercury, thus :—

$$Hg_2SO_3 + Na_2SO_3 = Hg + Hg(NaSO_3)_2.$$

For practical purposes, therefore, the action of sodium sulphite upon mercurous chloride may be stated to produce mercuric sodium sulphite and metallic mercury, and the whole change may be expressed thus :—

$$2\ HgCl + 2\ Na_2SO_3 = Hg(NaSO_3)_2 + Hg + 2\ NaCl.$$

It is important to notice that the sodium sulphite does not play the part of a reducing agent at all, for it is not oxidized ; and that half the mercury is dissolved, the other half remaining as metal. I have confirmed the truth of this reaction so far as identifying the mercuric sodium sulphite in the solution by the properties it is stated to possess, and I have proved analytically that half the mercury is dissolved, and that the other half remains as metal. If, therefore, it were possible to exchange the silver image of a negative for mercury, it would not be possible to increase the amount of metal by the action of mercuric chloride followed by sodium sulphite. The contrary of this has been stated by some writers on photographic subjects.

The action of sodium sulphite upon mercurous silver chloride does not appear to have been investigated. The current and incorrect idea has been referred to above. My investigation of the reaction is not yet so complete that I can give a proved equation to represent it, but it is not likely that further work will discover results of practical interest to the photographer. When sodium sulphite reacts upon mercurous silver chloride, the whole of the chlorine goes into the solution ; three-fourths of the mercury and half the silver are also dissolved, and one-fourth of the mercury and half the silver remain in the metallic condition to form the image. The action may be represented thus :—

$$4\ HgAgCl_2 = \underbrace{3\ HgCl_2 + 2\ AgCl}_{\text{Dissolved by the sodium sulphite.}} + Ag_2Hg.$$

The Ag_2Hg remains to form the image, and the mercuric chloride and silver chloride are taken up and doubtless changed by the sodium sulphite in a way that might easily be conjectured ; but, as I have not yet proved by experiment the compounds that are formed, it is better to leave it an open question for the present. I have also proved that the silver and mercury are actually present in the above proportion in a negative intensified by mercuric chloride followed by sodium sulphite, by an estimation of the metals present in the film. It will be observed that this method of intensification results in an exchange of half the silver of the image for mercury, four atoms of silver (4 Ag) yielding after the action two atoms of silver and one of mercury (Ag_2Hg). This generally results in a slight increase of density, but not always ; it appears to depend upon the physical condition of the film and its image

whether or not the exchange of half the silver for less than its own weight of mercury (216 : 200) will give increased density; but personally, I have found that there is an intensification effect in the vast majority of cases.

There are statements concerning this method of intensification that I have not been able to confirm. First, that by repeating the operation any density can be obtained. This is probably the assertion of a mere theoretician who argued from false premises. I have repeated the process six times on a plate, and the density is greatest where it has received only one treatment. It has been pointed out above that so far as mercury itself is concerned, the action of these re-agents does not increase its quantity. Secondly, that a negative intensified by this process may be reduced by immersion in a solution of sodium hyposulphite. I have never found this to be the case, even by prolonged treatment (one hour), nor can I see any reason to expect reduction under these circumstances.

There is what at first appears to be an anomalous property of the image resulting after the application of this intensifier, namely, that it is invariably darkened to a slight extent by the application of ferrous oxalate to it. As the solution of the chloride of silver in sodium sulphite, as shown in the above equation, is not very stable, it may be that a little silver chloride remains attached to the image, and that this is reduced to the metallic state by the ferrous oxalate, but the fact remains that, even by prolonged treatment with fresh sodium sulphite solution, I have been unable to eliminate whatever it is that leads to this effect.

It may be worth while recording here that if mercurous silver chloride and sodium sulphite are allowed to remain in contact for some days, the residue is chiefly silver instead of Ag_2Hg. This fact has probably no photographic significance.

The Action of Ferrous Oxalate.—In order to make quite sure of the processes that I am about to recommend, I have proved experimentally that a solution of ferrous oxalate reduces both silver chloride and mercurous chloride to the metallic state; and that ferrous oxalate solution removes all the chlorine from mercurous silver chloride and leaves the whole of both the metals as such.

Practical Methods.—The method of getting control in density that I wish most urgently to recommend to those who aim at getting good negatives with certainty is, to take care that in development the density of deposit never exceeds what is required, and then to work up the negative to the best condition by the action of mercuric chloride followed by ferrous oxalate, repeating this process if necessary; or, if the intensification that would be given by these re-agents is conjectured to be too great, following, under certain conditions, the mercury solution with sodium sulphite. The important matter is that every effect shall be thorough, that every atom of silver in the negative may be acted upon in the same way and to the same extent.

I first recommended the use of mercuric chloride, followed by ferrous oxalate, in 1888, in the PHOTOGRAPHIC NEWS (Vol. XXXII., p. 18), and in my "Introduction to the Science and Practice of Photography." During the last two or three years I have had considerable experience in the application of this process, and could have shown many negatives treated by it, but so far as appearance goes it is very doubtful whether anyone could distinguish a negative so intensified from one not changed after development. To illustrate the effect, I have treated various parts of a thin landscape negative, which includes sky, sea, distance, middle distance, and foreground, up to four times.

The solutions that it is advisable to use are—

1. A saturated solution of mercuric chloride, to which has been added two or three cubic centimetres of strong hydrochloric acid to each litre (or half a dram to each pint). No ammonium chloride or other salt should be added. There is no need to use mercuric bromide, as stated by Burton and Laurie, nor is the subsequent exposure to light specified by these gentlemen at all requisite. The operations may be carried on by daylight or gaslight, and, indeed, I have not found it necessary to pay any attention whatever to the light that falls upon the plate. After the mercuric chloride the washing must be thorough, generally about an hour or an hour and a half, with constant changes of water.

2. The ferrous oxalate is conveniently prepared by adding one part by volume of a saturated solution of ferrous sulphate to about six parts by volume of a saturated solution of neutral potassium oxalate. The potassium oxalate may be just acidified with oxalic acid, but acid tends to retard the action of the oxalate. The solution may be used weaker than above, but then it acts more slowly. The action of the ferrous oxalate is retarded if all the mercuric chloride is not washed away from the negative, though the addition of mercuric chloride to the ferrous oxalate solution does not appear to have any appreciable effect. If the action of the ferrous oxalate is made unduly slow, the reduced silver and mercury will tend to whiteness, as is also the case in a very slowly developed negative. The slaty colour of the metals produced in extreme cases, especially at the glass side of the film, may lead an inexperienced operator to consider the action of the ferrous oxalate unfinished, although the reduction is complete.

3. The solution of sodium sulphite may vary as to strength within wide limits; a five to ten per cent. solution is convenient. A little acid should be added to it, preferably sulphurous, until the solution ceases to give a red colour to a dilute solution of phenol-phthalein. Litmus paper is useless in this case. For ordinary work it is sufficient to take advantage of the fact that if a good sample of crystallized sodium sulphite is dissolved with one-thousandth of its weight of citric acid, the alkali in it will probably be neutralized. To be on the safe side, five times this amount may be taken, say half a gram of citric acid to one hundred grams of sodium sulphite, or two and a half grains of acid to one ounce of sulphite. It is a mistake to say that a negative should be only just rinsed after treatment with mercuric chloride when sodium sulphite is to be used. The washing need not be so thorough as in other cases, but the more complete it is the more rapidly will the sulphite produce its effect.

We have already seen that mercuric chloride, followed by sodium sulphite, will not add to a mercury image, the operation leaving exactly as much mercury as there was originally; and as the effect of mercuric chloride, followed by ferrous oxalate, is simply to accumulate mercury upon the original silver of the negative, the intensifying action of the sulphite method becomes inappreciable after two or three applications of the oxalate method. This gives an additional uncertainty as to the intensifying effect of mercuric chloride followed by sodium sulphite; but the small amount of added density given by this method is often valuable, and the process has the advantage that if it does no good it does no harm, for the negative, after a thorough washing, is just as amenable to the mercury and ferrous oxalate as if the sulphite had not been used.

It will be observed that the reducing power (using the expression in a chemical sense) of the image is lessened by the application of mercuric chloride and sodium sulphite, the Ag_2Hg being able to take to itself only three atoms of mercury by one application of mercuric chloride and ferrous oxalate, while the original four atoms of silver could take four atoms of mercury. But the difference in density given by mercury and ferrous oxalate when applied to a negative before and after the use of the sulphite method is not practically appreciable.

I had hoped to have been able to give a more or less exact idea of the densities of negatives as varied by such treatments as have been described, but the visual opacity sometimes proves different from the retardation of printing processes. It appears that this may always be so; but, whether or not, it is wrong in principle to attempt to estimate one effect by the measurement of another, when the two are not of necessity proportional. I have found also that the increase of printing density produced by the same operation varies somewhat according to the conditions under which the changes are effected. It may, however, be stated in practical language that one treatment with mercuric chloride and ferrous oxalate generally about doubles the opacity; that after a second treatment the result is about equal to that produced by the application of mercuric chloride followed by ammonia upon the original negative; and that mer-

curie chloride and sodium sulphite on the original gives a density about half way between the original and that treated once by the oxalate method.

Doubtless, if the manner of controlling density here advocated is adopted, some operators will find troubles; and in order, as far as possible, to forewarn those who appear to have a predisposition to fail, I have endeavoured to discover all the drawbacks that beset the operations. If the plate darkens very slowly under the ferrous oxalate, and the oxalate is not unduly diluted or acid, the washing after the mercury salt has been insufficient. But at the same time it may be remarked that ferrous oxalate is much slower in action than ammonia or sodium sulphite. If the finished negative has a black looking stain upon it, the ferrous oxalate has not been washed away, and a further washing will rectify it. The removal of the excess of mercuric chloride is greatly facilitated if the mercury solution is poured off when the glass side of the film is grey, then a sufficient quantity of the solution is probably in the film to complete the bleaching. It is, however, important to make the bleaching thorough in the end, if a truly proportional effect is sought after.

The minor advantages of the use of the methods recommended might be set out in a formidable list. There is no tendency to frill, even with repeated treatments, the operations are clean, the negative is in no way stained, the shadows are not choked up, and the lights do not lose their gradation. The operations are reliable, and the results are permanent. In order to test this last matter, I heated an amalgam of silver, containing an equal number of atoms of each metal, at the temperature of boiling water for about twelve hours, with occasional weighing, and found that the volatilization of the mercury gave a loss equal to nearly one part in two hundred per hour—indicating a want of permanence. But a part of a developed plate that had been intensified by the mercuric chloride and ferrous oxalate method until it probably contained more than ten times as much mercury as silver, after heating in a steam oven for six days (forty hours) showed no sign of diminished density either on a varnished or an unvarnished part. The density, indeed, seems rather increased by the treatment, and this may be due to a shrinkage of the film brought about by the prolonged heating. Thus the gelatine confers an extraordinary permanence upon the otherwise slightly volatile mercury. It may be noted as a fact, though hardly an advantage, that after intensification by the methods advocated, a negative is as amenable to intensification by many and probably by all other processes as it was originally. But the greatest advantage of all is that these processes enable the photographer to work step by step up to the density he desires, with the full conviction that the character of the gradation of the negative is not altered.

Photographic Club.—The subject for discussion on Wednesday, February 12, will be "Artificial Light for Portraiture"; on February 17, "Lantern Illuminants."

Incandescent Lamp.—*Kuhlow's Review* is responsible for the following curious paragraph:—"It has hitherto only been possible to produce incandescent lamps of a comparatively inferior light-strength, and hence it has not been practicable to use them everywhere, such as in large rooms and open spaces. This disadvantage has now been overcome, as it has been possible to produce incandescent lamps of 3,000 candle power. These lamps, which have been named high candle-powder incandescent lamps, like all incandescent lamps, have a uniform clear, yellow light, whereas the arc lamps, which are at present alone employed in illuminating great spaces, have the well-known unpleasant bluish light, and burn very unsteadily. The incandescent lamps hardly require any maintenance; they burn for 1,000 hours without supervision, and they are therefore much cheaper than the arc lamps, which require constant attention, besides causing great expense for charcoal. The high candle-power incandescent lamps are therefore likely to soon drive out entirely the arc lamps, and the electric light will then become still cheaper and more popular, as the incandescent lamps yield a perfectly natural light, and now also a light in sufficient volume to meet all requirements.—*Invention.*

THE NEW ROLLABLE CELLULOID FILM.*

BY W. H. WALKER.

Fortunately the new film does not require exceptionally skilful manipulation. Probably no radically new product of similar importance was ever more simple in construction, or more tractable when intelligently manipulated: but such peculiarities as do exist require reasonable attention and provision. Without these requirements, the film may be a needless cause of vexation and loss, while a little precaution will enable it to be manipulated with the utmost ease and certainty.

As has been repeatedly stated with reference to the stripping film, a cut sheet is *never* recommended excepting for single exposures with small stops, as no practicable device has yet been produced which will hold a cut or free sheet sufficiently flat within the focal plane; but a roller slide, if properly made and adjusted in conjunction with a proper film, will perform the feat sufficiently well for all practical purposes.

The roller slides sold by the Eastman Company during the past five years vary somewhat in detail, but all have certain fundamental devices, some of which require with the new film *not* alteration, but adjustment, which any one possessed of an ordinary pocket-knife may accomplish in five minutes.

1st. The rollable transparent film does not require and will not endure an excessive tension in the direction of its length, and in some cases, where the resistance-brake is too powerful, the film willl be stretched out of its normally flat condition.

Therefore, to reduce this tension in all the roller-slides—excepting those originally made with the internal metallic frame—spring open the crescent-shaped wire which causes the resistance, by inserting the edge of a knife-blade between it and the circular groove within which it lies, and also place within the groove a single drop of salad oil.

2nd. By far the largest number of the Company's slides are of the wooden frame variety, and have on the outside of the case a brass spring alarm actuated by a projection on the periphery of the indicator dial. This alarm spring is fastened securely at one end of the wood by two screws, while near the dial there is a third screw by which the resistance offered to the revolutions of the dial may be increased by running the screw further into the wood, and the contrary effect obtained by partially withdrawing it.

Therefore, if by any chance the resistance-brake within the instrument case should be *too weak*, and thereby permit the film to slip over the measuring roll (*i.e.*, the roll having the perforating pins at its ends), we obviously have another means of correcting an error.

Development.—Nothing could be simpler than the development of the new film; it is so thin that it should, when properly soaked, adhere to the flat bottom of any ordinary developing-dish; but if for any reason any difficulty occurs, it is evident there are many simple devices which will cause it to remain perfectly flat. For this purpose has been invented a cheap and simple developing tray, which fully answers any conceivable requirement, and which will reduce the amount of developer ordinarily used to such an extent as to more than pay for its cost with the first spool of film used with it.

Development may be conducted with any approved

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* From *The Journal of the Camera Club.*

formula, but we must recommend that contained in the printed instructions which accompany each packet.

In drying, we have not found it necessary to resort to any other expedient than simply suspending the negative by one or more of its four corners from ordinary pins. In drying the negatives may curl inwards, but when dry simply roll them, film side out, over any cylindrical surface, and there allow them to remain for about an hour, after which they will remain flat.

In damp climates, like that of England, the use of a bath of glycerine to ensure flexibility is not recommended. When not in use, the films should be kept flat between the leaves of books or in the Company's film negative boxes, which will soon be ready for sale. These boxes will enable many thousands of negatives to be stored within a remarkably small compass, and by a simple classification any one of the series may be obtained without displacing any of the others.

The Company's factory in America, specially designed for the manufacture of this film, is daily increasing its output, which at present is a serious task, as there are fully 25,000 instruments of its production requiring supplies.

The English company, however, are pushing forward with all possible speed their proposed English factories, which will be planned upon such lines as will ensure a continuous supply, while both companies will work in entire harmony with each other other to prevent undue shortage.

In closing, may I say that it is not for one moment assumed that the experience of the future will not be fully as valuable as that of the past, and that the Company continue to rely upon the kind forbearance of its friends to aid it in determining the true cause of any alleged defects, for without this information progress is greatly retarded.

PHOTOGRAPHIC LIBRARY CATALOGUE.—We have received the proof-sheets of the Catalogue of the Library of the Photographic Society of Philadelphia. It is high time indeed that this valuable collection of books had been put in order and classified. The Society having started to accumulate these books in 1862, will account for the numerous antiquated volumes pertaining to early processes that are to be found on its shelves. A large portion of these books may thus be said to be quite obsolete in so far as modern practice is concerned; but they are still interesting historically, and will often be found useful to those closer students of the art who endeavour to trace the growth or development of one process from another. We understand that the present executive committee of the Society intend to make the Library a chief feature of usefulness, and to add numerous treatises and text-books to the collection, besides supplying all the best journals for daily reference. Journals pertaining to photography are now in the table cases, and they may be considered as the representative ones of present times; beside the American and English, there are also the German and one French; the latter being the official organ of the Photographic Society of Paris. The preface to the Catalogue reads as follows: "It is hoped that the following Catalogue will be useful in aiding those who desire to refer to the valuable Library belonging to the Society, its contents being now for the first time arranged in alphabetical order. A noteworthy feature in the Library is the number of complete sets of journals, dating from the earliest days of the art down to the present time. Although separate text-books of the various branches of photographic science are not wanting in the Society's collection, the journals—which detail the progress of the art from day to day—still remain the most useful sources of information."—*American Journal of Photography.*

ERNST SCHERING.

IN alluding to the death recently of Mr. Hugo Schering, the senior member of the firm of Schering and Glatz, of Maiden Lane, the *Oil, Paint, and Drug Reporter* gives some interesting particulars about his uncle, Mr. Ernst Schering, the well-known manufacturing chemist of Berlin, whose death occurred about three weeks prior to that of his nephew. From this account we append an extract.

Mr. Ernst Schering, the celebrated founder of the firm Chemische Fabrik auf Actien (vorm. E. Schering) was born at Prenzlau, May 31st, 1824. After attaining his school education he entered for apprenticeship at Berlin, in 1840. Though this term was to be for four years, he had shown such ambition in the execution of practical chemistry that after eighteen months he was consulted in the production of chemicals when such were contemplated.

The art of photography, originating from the method of Daguerre for the production of light pictures, induced Mr. Schering to devote his attention to the production of the chemicals required therefor, such as iodine and its salts, silver and gold salts, and pyrogallic acid. He recognized that the unsatisfactory results in photographic duplication were in greater part due to the irregular purity of the chemicals used, and consequently devoted his energy to the production of the purest chemicals for photographic purposes. In course of time the number of chemicals produced by Schering's factory continually increased. It was, however, the motto of the owner to keep the qualities of his preparations at the highest possible standard, and never to have them impaired by the manufacture of larger quantities. Encouraged by his successes, Schering undertook, at the first Paris exhibition, in 1855, to show his iodine salts and resublimed iodine, as also some few other preparations, in great purity and beautiful crystallization. The manufacturer, then practically unknown, was honourably rewarded, and from that time on his preparations received considerable attention from all consumers. With the extension of business came the creating of agencies in the principal commercial cities of Europe and also America. The relations with the trade in this country became so important, that Mr. Schering always exercised the greatest care in the preparation of goods for this market. His restless and uninterrupted activity at the laboratory for many years had its evil effects on his physical constitution, and only after the most ardent and repeated suggestions of his physicians could he be induced to seek rest at intervals. After visiting Teplitz, to effect a cure of his ailments, which, however, failed to give the desired results, he concluded to form a stock company whereby he could increase his facilities. This transfer took place October 31st, 1871, when the firm of E. Schering was converted into the Chemische Fabrik auf Actien, vorm. E. Schering, in which he consented to be one of the leading directors.

GESTURES AND SPEECH MECHANICALLY REPRODUCED.—Edison has been developing his great idea of making use of photography as an adjunct to the phonograph in order to bring a speaker's personality before the eye. The result of Edson's experiments has been a wonderful machine. In front of the speaker are placed two small machines, one a phonograph, and the other an ingenious piece of mechanism by which photographs of the speaker are taken in succession with enormous rapidity at intervals of from one-eighth to one-twentieth of a second, and both these machines are at work silently recording both the uttered speech and the personal appearance of the speaker at each fractional part of a second. The results thus obtained may be sent to any desired point, and the photographs thrown on a screen by an ingeniously-contrived piece of mechanism. Thus the exact appearance of a speaker, with all his gestures and play of features, is exactly reproduced, while the phonograph simultaneously delivers the speech. The interval between the successive photographs is so infinitesimal that the screen picture is apparently a living one, moving, gesticulating, and apparently uttering the words which in fact are spoken by the phonograph.—*New York Herald.*

INTERNATIONAL COPYRIGHT.

BY WILLIAM BENHAM.

Perhaps no branch of the law is in a more confused state than the above, as will be seen by the following.

Probably most of your readers are aware that photographs were not protected until 1862, when the Act of Parliament (25 and 26 Vict. 68) was passed which vested in photographers the copyright of their negatives, prints, &c., and the right of reproducing the same during their own lives and seven years afterwards, or for a term of forty-two years, whichever should be the longer. So far a photographic copyright was placed on exactly the same terms as the literary copyright, except that literary copyright was protected in several foreign countries provided certain conditions were observed as contained in two Acts of Parliament which will afterwards be referred to. By the Act of 1862 registration was imperative if the owner of the copyright wished to protect himself against piracies, as he was unable to properly found his action or suit until after registration, which had to be done within three months of the date of first publication.

By Acts of Parliament passed in 1843 (7 and 8 Vict. c. 12) and in 1852 (15 Vict. c. 12), it was enacted that authors in any foreign countries which had by convention or treaty with this country given reciprocal rights to a British author should have a copyright in his literary composition according to the laws of this country. By the before mentioned Act of 1862, the above two mentioned Acts were re-enacted, and the same was to have effect with such countries as should from time to time be named in an Order in Council.

On the 10th day of January, 1852, an Order in Council was published in the *London Gazette* giving British subjects international copyright in their literary works with France, Germany, Belgium, Austria, Prussia, and Spain. It will be seen that the above Order in Council was issued twelve years before the passing of the Photographic Copyright Act, but as this Act re-enacted the two International Acts, it has been successfully argued that the Order in Council was also taken to be republished.

If any readers contemplate taking proceedings for infringement of their photographs, it is first of all necessary to make sure that the same are registered in the country of origin, and that they have complied with the conditions of the Treaty or Convention with the country where the same are being infringed. The usual conditions in all countries are that they should be registered there as well as here within the period of three months from their first production.

The certificate of registration in foreign countries requires to be authenticated by one of its Ministers before it can be given in evidence in a court here. With regard to the remedies in this country, they are threefold: an action for damages, an injunction to restrain the wrongdoer, and proceedings for penalties upon a summons before a magistrate. International copyright in music has by an Act passed in 1888 been much simplified, and now the author or composer of a musical composition or song has only to register in the country of origin; proof of such registration is sufficient to perfect the title for all purposes connected with proceedings in our courts so far as the copyright is concerned.

Developers for Films.—Major J. F. Nott says that soda is the only alkali which can be used with advantage with stripping films. Quinol is an excellent developer, but it destroys the gelatine film.—*Journal of the Camera Club.*

SELF-LUMINOUS TRANSPARENCIES.

Photographers are always on the look-out for something new or attractive, and yet many excellent suggestions are made and immediately forgotten, simply because they fail to reach the eye or ear of the man with sufficient foresight and enterprise to take advantage of them. What, for instance, would be more attractive to, well, a large portion of creation at a certain period of life, and under certain circumstances, not only to have a picture of the loved one that may be gazed upon during the day, but that in the darkness and during the silent watches of the night may be taken from under the pillow, and, self-luminous, every feature of the beloved countenance traced? This, and many other equally useful applications of what was at one time well known, Balmain's paint, may be made by any photographer with profit to himself and pleasure to his customers.

Balmain's paint is a sulphide of calcium or barium, or a mixture of both, and, as is well known, possesses the property of absorbing certain of the more refrangible rays of the spectrum, and continuing to give them off again for a considerable time in the dark. When the material was first popularised by Balmain it was largely employed in coating clock faces, candlesticks, match boxes, and other articles likely to be required in the dark, and, as evidence of the durability of the material, we have a match box on the cover of which is a tablet so coated, that has been in constant use for at least eight years, and which, if exposed to light during the day, is as luminous at night as it was when it came into our possession.

From time to time suggestions to employ the sulphides in connection with photography have been made without attracting attention, and more recently the matter has been taken up by the *American Lithographer and Printer*, which recommends the rendering of suitable lithographs or photographs translucent, and laying them down on a card that has been coated by dusting the luminous powder over a varnished surface.

No doubt fairly good effects may be produced in this way, but we think we can suggest one that for photographs, at least, is very much better. It is to print on glass a transparency of any desired size from a negative, and when dry, coat it on the film side with an emulsion of the sulphide in gelatine or other suitable vehicle. Balmain's paint was at one time, and may be yet for all we know, sold in bottles, in a dry powder mixed with gelatine, so that it was only necessary to add water to the consistence of cream to make it ready for use. We are under the impression that Warnerke, in coating the tablets for his well-known sensitometer, employs melted paraffin, in which case the picture would require to be gently warmed to allow of the mixture being evenly spread.

We think the size of picture most likely to take, and most conveniently made, would be one made on the ordinary lantern slide plate; and in reducing by copying in the camera, the negative should be placed so that the picture will be correct when seen through the glass. They should be backed with some impervious material, or, better still, put into the old-fashioned leather cases, if they are still to be found; and if any of our readers are enterprising enough to make a few from some of their best negatives and show them to their customers, we feel fully warranted in promising them a ready sale and many orders.

Who will be the first to advertise "The new night-blooming photograph?"—*The Beacon.*

Notes.

The general public, ignorant of photographic advance, cannot quite understand the reproduction of photographs in newspapers. They are about as advanced as the illiterate family who, when one of its members with an artistic turn got a drawing accepted by an editor, refused to believe that the drawing was his, because it was in print. These good people had a vague idea that a picture was produced in print very much as the reading matter is, and they could not realize that it had to be drawn first. Reproductions of portrait photographs the public accept without asking any questions as to how the photographs get converted into blocks which can be used in a printing press, but a photograph of a landscape fairly puzzles them.

A case in point occurred the other day. An illustrated paper contained some reproductions by the Meisenbach, or a kindred process, of some instantaneous photographs. One, a bit of river scenery, was particularly charming, and it had the effect of causing the editor to receive several letters asking from what painting the copy was made. This was a great compliment to the photographer, and in addition to illustrating the point we have advanced, shows that the public have not yet fully grasped the fact that a photograph from nature can be as artistic as a painting.

An odd example of combining two hobbies came under our notice the other day. One of these hobbies, we need scarcely say, was photography; the other was a mania for collecting old suits of armour and old weapons. Where the combination comes in, is seen in the album, which the owner exhibits with great pride, containing a number of photographs of himself attired in the various suits of armour forming his collection. The fad is a harmless one, but the duty of looking through the album is rather trying to those with a sense of humour, for although the armour itself is seen to advantage, the wearer possesses a most pacific countenance, while the pose is not in every instance that which one imagines a Crusader would assume.

The insurance offices, so far as we know, still maintain their stolid indifference to the altered conditions under which photography is carried on. Some time ago, we drew attention to the fact that, despite the absence of all danger of fire, photographic studios were classed under the head of "extra risk." There was justification for this charge in the old collodion days, but surely dry plates have now been sufficiently long in use to warrant the premiums being fixed on the ordinary scale. If any photographer has of late made any effort to get his insurance reduced, it would be interesting to know his experience.

No one would wish to lessen the glory of Daguerre by a jot, but is there not rather a tendency to overdo the homage which is being paid to his memory all over the world? In the universal pæan of praise which is being sung, one is apt to forget the name of Talbot. It is no question of rivalry between Talbot and Daguerre which we desire to raise, but rather a reminder that, while Daguerre's process is practically extinct, the germ of the Talbotype yet remains incorporated in our everyday work. The proposal by the Boston Convention to raise a memorial to Daguerre in Washington, by means of a one dollar subscription, has drawn forth a comment similar to that which we have raised above.

Whether from its costliness, or from some practical difficulty, luminous paint has not fulfilled the future held out for it. We now learn that a firm in Austria has discovered a mode of preparation which will lessen its cost of production to about one-sixth of its present price in England. What reliance may be placed upon this statement we cannot say, but if true, a great demand will spring up for the paint, for which there are a hundred uses.

A reaction, it is prophesied, will before long set in against the huge, unwieldy sizes which the majority of American newspapers affect. People, we are told, are beginning to cry out for smaller papers, less padding, less trash. One authority declares that a one cent paper is wanted, somewhat larger than a lady's handkerchief, printed in leaded nonpareil, containing the news up to twelve, one, or two o'clock last night, in two, three, or four line items. He recommends typewriting in nonpareil style of type-writing type, photographing it, and dashing it off in sixty minutes. All this sounds very go-ahead, but the authority omits to say how long the preparation of the photographic block will take. We fancy that when the details are gone into, the old-fashioned way of setting up type will be found the speedier.

The French police are nothing if not scientific. They have now obtained, by means of photography, large cartoons of the hands of various artisans, artists, and professionals, so as to carry out their speculations as to the fact of the hand proving the occupation. This selection does not seem very complimentary to the artisans, artists, and professionals. The latter term, by the way, is rather a wide one; does it include professional thieves? Apropos of the hand, what a pity it is that some student of Desbarolles and D'Arpentigny does not issue a new edition of the former's great work on Palmistry, illustrated by photographs? The hand is admittedly the most difficult member of the body to draw, and the illustrations in these volumes, instead of elucidating the divisions and subdivisions of the subject, rather tend to confuse them. The professor, no doubt, has definite ideas on the distinction he draws between various hands, but when these ideas have to be translated by an artist, we get something very often totally different. Now about photographs there could be no mistake. Any one who has tried to master D'Arpentigny will admit the truth of this.

SOME EXPERIMENTS WITH EIKONOGEN.

BY C. BRANGWIN BARNES.

As the new developer seems to have created some little stir in the profession and to act in an entirely different manner in different hands, it may not be uninteresting to detail some experiments which I have recently made with a view of comparing the qualities of eikonogen as a developer with those of pyrogallol and ferrous oxalate. The experiments in question were made with a sample of what is termed "white crystalline eikonogen" (probably for some reason known to the manufacturer), although in reality it is of a delicate yellow tint. This I received in a capsuled bottle containing one-tenth of a kilo of crystals about the size of peas. In order to give the developer a fair trial, I decided to first follow implicitly the instructions I received therewith, and as I imagined that, even when powdered in a mortar, the solubility would not be so perfect in cold water as in hot, I chose the latter and made up my developer with four parts of sulphite of soda, one part of eikonogen, and ten parts of boiling water. I thoroughly stirred this with a glass rod until the whole of the eikonogen was dissolved, which dissolution occupied about ten minutes, and I now had a somewhat murky liquid of a pale primrose tint, which I poured into a bottle, and proceeded to mix three parts of pure crystallized carbonate of soda with twenty parts of hot water, which I poured into another bottle, and allowed both to cool.

On proceeding to develop a plate, I took three ounces of the eikonogen solution, and added thereto one ounce of the soda, and placed the plate in the mixture without the previous bath of water usually adopted with the pyrogallol developer. In order to compare the time of development, I rocked the bath as with the pyro. The negative commenced to develop almost immediately, and had all the detail out in three minutes, but was sadly lacking in density. I therefore continued the development for another minute and a half, with the result that the plate obtained a good printing density, without in any way fogging or damaging the shadows. I then substituted a second plate without changing or strengthening the developer, and again obtained an equally good result; I then attempted a third, and was again successful, although in this case the development was prolonged to five minutes, and the negative was rather thinner. I fixed in the combined hyposulphite and bisulphite of soda bath without using alum, and found I had three good printing negatives. Between the two first developed there was no perceivable difference, but the third was certainly slightly inferior. Pouring back the used developer into a glass measure I examined it in the light, but failed to find any pronounced signs of oxidation, so put it aside until the following day, when it appeared but a trifle darker in colour, and I again attempted to use it; the result, though not altogether satisfactory, far exceeded my most sanguine anticipations, as it yielded me a negative full of detail, though requiring intensification.

My second experiment was with an opal plate, and here again the new developing agent came out with flying colours. I should have mentioned that the three plates used for the first experiment were No. 1 Derwent rapid, No. 2 Britannia ordinary, and No. 3 Ilford white label.

My third experiment was with an isochromatic plate, which required six minutes to complete development. The result was, however, good, with the exception that there was a slight veiling of the deepest shadows; the detail was fully brought out, and the density all that could be wished for. So far, my experiments had all been conducted with what I have reason to believe were properly exposed plates; the next, however, was one which I knew to be much under-exposed, having been taken with a Stirn's detective camera on a not over-bright winter's day, the exposure being about one-tenth of a second. To my surprise and gratification I was enabled to develop out a considerable amount of detail, far in excess of that which I obtained on another plate exposed under identical circumstances and developed with pyro and ammonia. The difference between the two was most marked, the eikonogen yielding a negative with a fair amount of detail, but needing intensification, while the pyro gave me one without any detail whatever, only the high lights developing at all. An attempt to develop an over-exposed plate resulted in failure, although it might undoubtedly have been saved by the addition of a little bromide to the developer; but this was not tried, as my intention was, on this occasion, to test the merits of the developer according to the formula issued therewith, and having done so, I proceeded to conduct further experiments with an altered or modified developer. In the first place, I substituted ordinary washing soda for the pure crystallized carbonate, and must confess that I was unable to distinguish between the resulting negatives. I next attempted the use of ammonia as an accelerator, but do not consider it necessary to detail the individual trials, as it did not seem to yield such good results as the soda, although the time occupied in development was materially shortened. Such being the case, I again reverted to the first or published formulæ, with the exception that I added half a dram of bromide of potassium to the eikonogen in solution, which has the effect of prolonging the development and lessening the detail.

In conclusion, I must give my vote on the side of the friends of eikonogen, as I find it, in conjunction with soda, to be a quicker developer than pyro and soda, though, perhaps, a trifle slower than pyro and ammonia; the addition of bromide is very rarely required; the minute detail is more marked, the half-tones are better, and, to crown all, the colour, which closely resembles that obtained with ferrous-oxalate, is such that at least one-third the time is saved in printing as compared with the old and still popular pyro and ammonia. So far as cost is concerned, I must confess I can see very little difference between the two agents, though if one is cheaper in the long run I should opine it is eikonogen, added to which there is no doubt the present price will decrease as the demand increases. It is, perhaps, an additional advantage that the new developer does not stain the fingers, and that the dishes and measures are far more easily kept clean.

The foregoing notes merely represent my experiments up to the time of writing, but I am still engaged in a further comparative series.

Mr. Stanley, writing to a friend some particulars of his forthcoming book, which he hopes will be ready in May, states that he has a number of most interesting photographs of scenery, and sketches of interest, and that maps will be a prominent feature.

Royal Institution.—The Rev. Canon Ainger will begin a course of three lectures on "The Three Stages of Shakespeare's Art" on Thursday, the 13th of February; and Lord Rayleigh will begin a course of seven lectures on "Electricity and Magnetism" on Saturday, the 15th of February.

A PHOTOGRAPHIC FIEND.

WHILE we were sitting at our desk working hard to get out a leader for the front page of the *Pirate*, a timid rap sounded on the door, and at our yelling "Come in!" the most comical specimen of humanity that ever drifted into our sanctum appeared. How he ever managed to walk through the street from the Puma Hotel to the *Pirate* office without being riddled with bullets is more than we can understand. The boys must have all been sitting in a game over at the Dew Drop Inn at the time. He was tall, thin, and homely, with hair the colour of a ripe carrot, and on his long, narrow feet were a pair of yellow shoes that might have been called handsome in the effete East, but they looked very ratty in our town. On his head he wore a little tourist's cap with a fore-and-aft visor, and on his lower limbs he wore a pair of short pants, which were held up by a yellow and black bandage which encircled his stomach. We endeavoured to be polite, but little Pete, our office boy, fell into a fit at sight of the freak, and we were obliged to stuff an exchange into our mouth to keep from laughing in his face.

"I beg pawdon, deah fellaw," said the man, as he entered and looked us all over through a little round piece of glass, "but I am er-aw-a tourist, don't ye know."

Of course we were glad to see him; we had to be, as it was our place.

"A tourist, did you say?" we asked, not knowing what else to say; and Pete had another fit, during which he pied a galley of solid nonpareil.

"Er, yaws, I'm travelling through the country, don't yer know, securing photographs of natives; and having heard that you had some particularly romantically dressed charactaws of the cow-boy type in this place, I thought I would see what success I would have in securing a few negatives."

"Well," said we, "the town is full of queer characters, and all that is necessary to bring them forth is to fire off a gun in the street."

"Why, how perfectly *odd!*" exclaimed the man; and stepping outside, he brought in a box and a bundle of sticks, which he set up inside of three minutes, and there had as pretty a camera as one could wish for. When we saw this our respect for the man rose several degrees, and we began to get interested. At first it was our intention to let the boys have some fun with him, but now we changed our mind, and decided to warn him.

"Aren't you afraid to aim that at some of these rough men?" we asked. "You see, they are liable to take you and your machine for a target, and indulge in a little revolver practice."

"Well, er, aw, to tell the truth, ye knaw, I am *rawther* timid, but I always awsk one's permission, don't ye knaw, er, before taking their photo."

"Well, take the advice of a friend and be careful," said we, as we sized him up again, and thought of the risk he was running.

"Thanks, er, awfully," said he; and carrying his camera to the door, he stepped out on the walk, and reaching into his hip pocket, pulled out the ugliest gun that it was ever our lot to behold. He aimed it into the air, and a report like a small cannon followed. Hardly had he replaced the revolver in his pocket when the boys came pouring out of the Dew Drop Inn, and, when their eyes rested on the tourist, they looked at each other, first in surprise, and then mischievously. Locking arms, they all faced the party with the abbreviated pants, and commenced to march on him. On they came, keeping perfect time, walking straight at him, and almost any other man would have turned pale and run, but not so with the dude. He pulled out a cigarette, lit it, and, after taking a few puffs, commenced to mark time. We could see plainly that the crowd were a trifle staggered at the man's nerve, and did not know whether to keep on and walk right over him, or try some other scheme to frighten him. Finally they decided to stop and hear what he had to say for himself, and they were not kept long in suspense.

"Gentlemen," said the dude; "if you don't mind, there being so many handsome fellows among you, I should like to take youah photographs." This knocked the boys all in a heap, but Col. Jno. Watkins was the first to collect his senses, and said:

"All right, pardner, bring out year photygraffin machine, an' we'll try ter look pleasant." At this the dude stepped inside the office, and, opening a valise which he had previously brought in, he took out another camera, laying it tenderly on a chair while he removed the one from the tripod. "I find," said he, as he glanced out of the window, "that in case the crowd is *very* rough, that, er, in ordah, aw, to successfully get their pictures, it is first necessary to thoroughly frighten them. Now, they will undoubtedly fire at the camera the moment it is aimed in their direction, and I must, er, aw, fool them, don't ye know. Observe me, and you will see how it is done."

Thereupon, he took up the camera which he had handled so carefully, and screwed it on to the tripod, and, going out into the road, aimed it at the crowd, who were patiently waiting with drawn revolvers.

"Aw, are you ready, gentlemen?"

"We are," they replied in chorus.

"Then wait one moment, till I, aw, return, and I will take your photos."

Hastily entering the office, the man commanded us to lie down flat upon the floor. We did as we were ordered, gazing through a knot hole in the wall the while, and we must own that what followed startled us. Col. Jno. Watkins gave the order to take steady aim at the camera, and at the word fire, twenty bullets entered the box, which exploded in its turn, tearing up the ground for twenty feet, and shattering every window within the block.

"That, aw, was twenty-five pounds of dynamite," coolly explained the dude, as he lit a fresh cigarette. Taking another tripod from his valise, he fastened it to his camera, and going out on the side-walk, addressed the frightened gang.

"Gentlemen, aw, you were very unwise, er, don't ye know, to risk your lives in that mannaw, and I would advise you not to fire at this one, as it would blow up the whole town." Every mother's son in that crowd turned pale at this, and Col. Jno. Watkins was upon the point of running away. "One moment, er, deah boy," said the dude, as he observed the colonel's action, "I desire youah photograph." Then pulling out that ugly gun, which had a bore nearly big enough for a jack rabbit to crawl into, he said: "Gentlemen, I want you, aw, one at a time, don't ye know, and as I point this aw, little revolver at a man, I, aw, want him to come forward and look pleasant." In this manner every one in the crowd was photographed, and told to skip a soon as the operation was over. The dude left that night on the stage, but we have since learned that he is a member of a private detective agency, and would warn our good citizens to be in constant readiness to take to the sage bush.—*American paper.*

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The annual meeting will be held on Tuesday next, February 11th, at 8 p.m., at the Gallery, 5A, Pall Mall East.

COPYING DRAWINGS.—A new method for copying drawings which may be found of service is described by *Building*. Any kind of opaque drawing paper in ordinary use may be employed for this purpose, stretched in the usual way over the drawing to be copied or traced. Then the paper is soaked with benzine by the aid of a cotton pad. The pad causes the benzine to enter the pores of the paper, rendering the latter more transparent than the finest tracing paper. The most delicate lines and tints show through the paper so treated, and may be copied with the greatest ease, for pencil, Indian ink, or water-colours, take equally well on the benzinised surface. The paper is neither creased nor torn, remaining whole and supple. Indeed, pencil marks and water-colour tinting last better upon paper treated in this way than on any kind of tracing paper, the former being rather difficult to remove by rubber. When large drawings are to be dealt with, the benzine treatment is only applied to parts at a time, thus keeping pace with the rapidity of advancement with the work. When the copy is completed the benzine rapidly evaporates, and the paper resumes its original opaque appearance without betraying the faintest trace of benzine. If it is desired to fix lead pencil marks on ordinary drawing or tracing paper, this may be done by wetting it with milk, and drying in the air.

DANGERS OF FLASH-LIGHT COMPOUNDS.*

BY JOHN G. BULLOCK AND CHARLES L. MITCHELL, M.D.

Within the last two years the community of Philadelphia has been startled by a series of fatal accidents occurring during the manufacture of magnesium flash-powder, a compound well known to photographers, whereby in all five human lives have been lost. On three several occasions explosions have taken place, each with fatal results, the last and most recent of all resulting in the death of three persons. As a natural consequence considerable attention and inquiry have been attracted to the subject of flash-powders and their probable dangers, and the writers of this paper were requested at a recent meeting of the Photographic Society of Philadelphia to prepare a report upon the subject.

The composition of the particular powder which was the cause of this disastrous loss of life is understood to have been powdered magnesium, chlorate of potash, picric acid, and bichromate of potash. No one of these ingredients is in itself explosive except under extraordinary circumstances, and may be considered as safe; but the moment that they are mixed an element of danger is introduced.

Many finely-powdered metals are prone to rapid oxidation; give them the oxygen and the reaction takes place rapidly, and is frequently accompanied by heat and flame. Powdered magnesium and powdered zinc have been known to become sufficiently hot to ignite material in contact with them, on being wet with water.

The addition to magnesium of a chemical rich in oxygen, or holding oxygen loosely, so to speak, increases its susceptibility to rapid change.

For instance, a match applied to some of the powdered metal will fail to ignite it, or occasions a mere glow from slow ignition; but let the magnesium be mixed with chlorate of potash or nitrate of potash to furnish it with oxygen, and the whole mass will flash with almost explosive violence. Again, mix with the magnesium and chlorate of potash some carbon, and under some conditions a dangerous explosive will be formed. For instance, oxygen gas is made safely from the heating together of chlorate of potash and oxide of manganese; allow some carbon to be accidentally mixed with the two ingredients and heated, and a violent explosion will probably ensue. The rubbing together of chlorate of potash and some organic substances is accompanied with a crackling noise and frequently explosion, as instanced in the combination with sugar or tannin.

Such compounds as we have spoken of are known as explosives, as typically illustrated by gunpowder—a mixture of nitrate of potash, carbon, and sulphur. Another and more dangerous class of chemical compounds which may be formed under some circumstances are known as detonators; that is, compounds the component parts of which are held together under so strained a condition of high tension, that a very slight cause, such as a light, sharp blow, will occasion them to fly apart violently with a sharp, loud report; in other words, they detonate. The force of an *explosion* is felt at a greater distance than that of a *detonation*, but the disruption of surrounding bodies is greater and more complex with the detonation than the explosion. An explosion is generally accompanied by fire and smoke; a detonation is not.

Many detonating compounds may be heated and burned until consumed without discharge, whereas the detonation or snapping of a common pistol cap in contact with or near them may detonate the entire mass; such is the method adopted in the explosion of mines, &c.

Picric acid is, in itself, we might say, perfectly safe, as it can be burned without danger, and will detonate only when confined. In compound, however, with some other bodies, it produces a class of very dangerous substances, notably picrate of potassium, picrate of sodium, picrate of barium, picrate of strontium, picrate of magnesium, and picrate of lead. These substances are extremely unstable in character, and liable to explode with slight percussion or friction with the liberation of immense volume of gas. Sarran states the relative force of picrate of potassium, when exploded, as compared with gunpowder, is as 1·98 to 1·00—almost twice as great. A mixture of 0·5 kilograms of potassium picrate and 0·5 kilograms of potassium chlorate evolves through its combustion 352 litres of gases. One kilogram of gunpowder evolves but 200 litres under the same circumstances.

Picrate of magnesium is, when dry, one of the most unstable of its compounds, and therefore highly dangerous to handle. It may be made in a wet way by double decomposition, or by the intimate mixture of the powdered ingredients. Time is, of course, an important factor in the latter process of manufacture, but a microscopical examination of the mixture, after long standing, will show that the metal has entirely disappeared, and the explosive compound been formed. There is no doubt but that this combination may be greatly assisted by the presence of atmospheric moisture. Powdered magnesium is quite hygroscopic, and has a tendency to cake together in loose masses, or adhere to the sides of a bottle, if exposed to a moist atmosphere. Picric acid, when powdered, is also rather sticky in character, and it can be readily seen how, if these two substances existed together in a mixture, they would be attracted to one another; then, given the elements of time, moisture, and perhaps some slight warmth, and a chemical combination would inevitably occur. That this is not simply theory, but fact, can be substantiated by a fact lately mentioned to one of the writers of this article by Prof. Henry Leffmann, of this city, in a personal conversation. He stated that some time previous, while microscopically examining a sample of flash-powder which contained picric acid, he was surprised to notice an entire absence of metallic magnesium, the yellow crystals of picric acid being alone prominent. On dropping the powder into water, however, an abundant sediment of metallic magnesium was deposited, showing its presence, and a closer examination of the powder showed that the particles of magnesium were completely enveloped in a yellow coating of picric acid. Of course these circumstances afforded a most fruitful opportunity for the conversion of these two substances into the explosive picrate of magnesium.

Here is the probable explanation of the late calamity at the laboratory of Wiley and Wallace. A bottle containing in the neighbourhood of several pounds of flash powder, made, after the before-mentioned formula, some eighteen months previous, was being emptied into a drain for the purpose of getting rid of it. No fire or other chemicals were known to have been present. Water had been thrown upon some of it to aid in its being carried down the drain. Experiments subsequently made proved that the presence of water would not occasion sufficient heat to ignite it. The most reasonable supposition is, therefore, that a small portion of the powder was detonated by an

* Read before the Photographic Society of Philadelphia.

accidental blow, and from thence the entire mass was detonated. No smoke or burns appeared upon the bodies of those killed, or surrounding objects, thus proving the absence of fire. For the preceding disasters by the same powder another theory must be advanced, as they occurred at the time of the mixing of the ingredients, and previous to the probable formation of the picrate of magnesium. In the first case there was an explosion during the process of grinding the material; in the second case, while the powder was being sifted. In the first case it can readily be seen that an explosion would be the natural sequence. In the second case it is probable that some clogging of the sieve occurred during the mixture of the materials. The loss of these five lives is a terrible caution against the use of the especial compound which caused the explosion, and a sufficient reason to regard with suspicion any powder the formula of which is not made public and known to be safe. This especial formula produced a compound which was alike unsafe to make, to use, or to keep. To sell such an article, therefore, for ignorant and unskilled persons to use, or to induce anyone to attempt its manufacture, places a fearful responsibility upon those who knowingly undertook such a risk.

It is much to be regretted that the formulæ of most of this class of preparations are not published, and it is highly probable, in many cases, that their ingredients have been combined with but little regard to their chemical properties and the chemical reactions which might occur from their admixture. The fact that the compound may bear a label proclaiming it "safe" is but a very slight guarantee when its composition is altogether unknown.

It seems hardly necessary now, in view of all that has been said, to raise a note of warning in regard to the use of all these flash-powders, but the statement has been already made that while this one particular compound was unsafe, other compounds are harmless. The writers wish to state, therefore, that they consider *all forms* of flash-powder dangerous, the difference between them being only in the degree of danger involved. As has been said, they are all composed of substances liable to rapid decomposition when in contact with each other: they are liable to form new compounds often possessing dangerous and unknown properties, their combustion is attended with an intense degree of heat, involving risks from severe burns, and they are liable to spontaneous explosion or ignition. This danger is greatly augmented when they are made or kept in mass, and the probable reason why a greater number of fatal accidents have not occurred is because the powders have mostly been made in comparatively small quantities and put up in separate packages, each containing but a few grains of the mixture. They contain, in most cases, chlorate of potash, bichromate of potash, permanganate of potash, ferrocyanide of potassium, nitrate of potash, amorphous phosphorus, and other highly organized compounds, the very purpose of their admixture with the magnesium being to increase its inflammability and the rapidity of its combustion. This can only be done by making the combination more unstable, and thus introducing at once a large element of danger. A simple mixture of magnesium and chlorate of potash, which has been claimed to be harmless, if placed in a confined situation, as in a pistol, and discharged by a cap, will detonate, and there is probably no compound of this character which does not possess some elements of danger.

Since the introduction of the different forms of the magnesium lamp, in which pure metallic magnesium can be burned with absolute safety, there seems to be but little reason why the use of flash-powder should be continued, and as the only possible advantage in their use over that of the lamp is that a slight amount more of speed may be obtained, the question may well be asked whether the possible advantages to be gained are worth the additional risk involved in the use of the flash-powder.

In conclusion, the following quotation from Eissler's work on "The Modern High Explosives" may well be cited here, more particularly in reference to combinations into which chlorate enters:—

"In mixing these compounds great danger is attendant, and too much circumspection cannot be used. They explode instantly upon any violent stroke, very often by friction alone; sometimes spontaneously, as when in a state of rest, and no known cause for their combustion can be assigned. Many are deluded as to its safety by so-called experiments with freshly-made powder. Manufacturers of the compound may attempt to show its safety by hammering it and cutting it, and similar tests; but let the powder be exposed to the natural atmospheric action, attract some moisture, then get dry, and the least friction or blow will cause an explosion."

The writers hope that the knowledge of the dangers attending the use of flash-powders is now so diffused that no farther accidents will result from their use, and that their manufacture will eventually be abandoned.

THE first number of the *Art World*, a weekly art newspaper, is announced for February 22nd. It is to be devoted chiefly to the pictorial and plastic arts, and to the interests of artists of all denominations. It will not be illustrated.

NEXT Monday, Mr. Douglas Freshfield will give a full account before the Royal Geographical Society of the search expedition undertaken by Mr. C. Dent and himself, which solved the problem of the fate of the two English mountaineers, Mr. Donkin and Mr. Fox, who were lost in the Caucasus in 1888. Mr. Freshfield's paper will be illustrated by photographs taken by Signor V. Sella, one of several travellers who succeeded last year in the ascent of Mount Elbraz, and by Mr. H. Woolley, who accompanied Mr. Freshfield in his search expedition.

THE following experiment showing how primary colours produce white is of interest. Cut a circle of pasteboard nine inches across, pencil it into four parts, then again each of these into seven. With bright, clear water-colours paint these narrow, pie-shaped slips with red, orange, yellow, green, blue, violet, indigo, in this order; then begin, and do this in each quarter. Put a round, smooth nail or pin through the centre of the disc where the points of the colours meet; drive this into a heavy board edge, and whirl it around as fast as you can. The colours disappear, and you see a round but rather dirty white circle. If the colours were pure it would be pure white; if they were really prismatic you would have a little shining white moon of light.—*Invention.*

MESSRS. PERKEN, SON, AND RAYMENT.—Our attention is drawn to the subjoined extract from the *London Gazette* of January 28th:—"Notice is hereby given that the partnership heretofore subsisting between us the undersigned, Louis Edmond Perken, Frederic Louis Perken, and Arthur Rayment, carrying on business as Manufacturers and Importers of Optical and Scientific Instruments at No. 99, Hatton Garden, and elsewhere in the County of London, under the style or firm of Perken, Son, and Rayment, has been dissolved by mutual consent, as from the 31st day of December, 1889. All debts due to and owing by the said late firm will be received and paid by the said Frederic Louis Perken and Arthur Rayment, who, with Edgar Theodore Perken, the younger son of the said Louis Edmond Perken, will continue to carry on the same business at No. 99, Hatton Garden aforesaid, in partnership, under the same style or firm."

A CAMERA WITH THE LUSHIA FIELD FORCE.*

BY TOM. DE LA TOUCHE.

We left Calcutta on the eve of a cyclone, and the weather was so gloomy that no pictures of the embarkation of troops or views of the river were possible; but as these have been often photographed, perhaps it was just as well not to be tempted to waste plates on them. Arriving at Chittagong, let us draw a veil over the events of the intervening two days. I tried a picture of the I. G. S. *Dalhousie*, which had brought us across; but having just before been showing off the beauties of the camera to some friends on board, and having left it on a skylight for a short time, one of these friends had taken the opportunity to set the lever that keeps the shutter open, and consequently, on releasing it, the shutter stuck halfway. The result was a picture that showed the *Dalhousie* as she might have appeared in the height of the cyclone, and which even a hardened sailor could hardly have contemplated without its bringing on an attack of sea-sickness. A view of the shipping in the river with boats in the foreground preparing to embark troops turned out better; but away from the river Chittagong is uninteresting, and does not lend itself well to the camera. Proceeding up the river, the little station of Rangamati, built on a ridge high above the river, makes a fairly good picture, but below this place and for a long distance above it the banks are monotonous, low hills covered with dense jungle to the water's edge extending for miles. At Burkul, however, two days above Rangamati, where the river cuts through a lofty range of hills, and is broken by a series of rapids, the scenery becomes finer, and several good views may be obtained. This is a grand place for fishing, and a rod should be included in one's kit, but the strongest kind of tackle, especially hooks, will be required. All the fish that I hooked broke away, sometimes straightening out the hooks or bending them into a ring. Above Burkul there is another long stretch of still water, and few good subjects for pictures are met with till Demagiri is reached, where one or two fine views may be obtained, especially of the rapids and falls above the station, and the rod may again be used with effect. There is a Kulsi village on the heights opposite Demagiri; and if one does not object to a steep climb of about 1,000 feet, a group of the inhabitants and their bamboo huts will repay the trouble of getting to it.

As far as Demagiri the journey is easy enough; and, as a police post has been established there for several years, it may be visited at any time. A steamer leaves Chittagong for Rangamati once a week, and, beyond this, dug out boats are easily procurable, which are fairly large and comfortable, and may be slept in at night, but a mosquito net is indispensable. Beyond Demagiri it would not be safer to proceed, at any rate for the present, without an escort; but in a few years, let us hope, these hills will be as free to the seeker after the picturesque as any part of the hills of Assam.

Camp Demagiri; 20th December, 1889.

PHOTOGRAPHIC COMPETITION WITH OTHER PICTORIAL ARTS.

The *Daily Telegraph* says:—There is no great probability, fortunately, of any development of the art, or rather scientific craft, of photography doing any harm to water-colour painting. What harm photography has been capable of inflicting on art has already been perpetrated, and it must be confessed that the mischief effected has been prodigious. It has killed lithography—the chalk branch at least; chromo-lithography has escaped, and will enjoy immunity until the secret of producing photographs in colour is discovered. It is killing the beautiful craft of drawing upon wood, and, allied with all kinds of electro "processes," it is killing the art of wood-engraving itself. It has nearly slain the art of portrait-drawing in crayons; although a good many French and a few English portraitists are fighting a valiant fight in the production of drawings in charcoal, and in "sanguine" or red chalk; while the enterprise and taste of Sir Coutts Lindsay have succeeded in giving fresh life to the beautiful, but almost moribund, art of pastel. Photography, however, has utterly and, it is to be feared, irrevocably slain the art of miniature-painting. The names of Carpenter, of Mee, of Margaret Gillies, of Thorburn, of Ross, of Karl Schiller, seem almost to belong to ancient history, and at the summer exhibitions of the Royal Academy miniatures have become almost as rare as enamels. Yet it is questionable whether the good deeds done by photography have not very far surpassed the artistic evil which it has undoubtedly wrought. The services it has rendered to the cause of archæology and architecture have been immense. Photography has lightened the labours of the botanist, the ornithologist, the comparative anatomist, the decipherer of manuscripts, the entomologist, the aeronaut, and the meteorologist. It has given material assistance to those whose calling is the detection of crime. It has been literally the traveller's joy and the solace of those who have never been able to wander to far-distant lands, of the scenery of which they are able, through the medium of the camera, to view exact and picturesque transcripts. Photographic portraiture, again, as a means of pleasant intercommunication between widely separated kinsfolk and friends, and as an agent for the cultivation of the domestic affections, has been productive in degree of comparatively as much social benefit to the community at large as cheap postage itself. Who are so poor and lowly, "so accursed by fate, so utterly desolate," as not to have been able to afford at some time or another a photographic portrait of themselves or of those they have loved, even though the counterfeit presentment has been taken for a few pence on the sands at a watering-place?

* From *The Journal of the Photographic Society of India.*

Correspondence.

PHOTOGRAPHY AND ILLUSTRATED PAPERS.

Sir,—My attention has just been called to a paragraph in your "Notes" of January 24th, in which you remark, referring to photography, that "The one man who, it would be thought, should have been among the earliest to practise the art, has not touched it; we mean the descriptive reporter." And then, referring to the new venture of the *Daily Graphic*, you add, "He may see the necessity."

Now, sir, I have seen the same, or similar assertions, made repeatedly in the photographic press; but, from personal experience, I feel bound to dissent from them. I happen to be on the staff of one of the leading trade journals, and some years ago, seeing the importance and usefulness of learning the art of photography, I did so, and although my work with the camera, and also with the "detective," has become my chief hobby, and I have so improved myself that no branch of the art comes amiss, yet I find it of no use whatever; certainly, for our own journal, I sometimes take a photo for reproductive purposes, but although I have offered my services to most of the leading papers, including the *Daily Graphic*, I am met with the stereotyped reply that they prefer pencil artists, who are capable of making rough sketches. As to my descriptive powers, they are fully appreciated by some half-a-dozen periodicals that I contribute to, but whenever photography is mentioned it is pooh-poohed. Practically, the only use I have as yet been able to put it to has been the illustration of some of my own stories; but for the newspaper proper—daily or weekly—it has as yet failed to grasp the use of descriptive writer and photographer combined.

I merely write this letter to give you the experience of one who has endeavoured to push himself forward on the lines you recommend for some years past, but finds there is no opening.

George Brown.

25, *Sturgeon Road, Walworth, S.E., February 1st.*

Manchester Amateur Photographic Society.—A Photographic Exhibition will be held at the Manchester Athenæum on Thursday, Friday, and Saturday, February 13th, 14th, and 15th. Open Thursday, 6 to 10 p.m., Friday and Saturday, 10 a.m. to 10 p.m. The Council have arranged for a lantern exhibition at 8 o'clock each evening.

Patent Intelligence.

Applications for Letters Patent.

1,388. A. WATKINS, Imperial Flour Mills, Hereford, "Instrument for Calculating Photographic Exposures."—January 27th.

1,394. G. J. HEATON, 2, Coburg Villas, Windsor, "Levelling Instrument for Cameras."—January 27th.

1,489. J. J. E. MAYALL, 1, Quality Court, London, "Colouring Photographic Impressions, and a Varnish or Enamel for the same."—January 28th.

1,501. W. W. BAGALLY, 3, Poet's Corner, Westminster, "Optical Illusion."—January 28th.

1,560. JANE MATHERS, 41, Reform Street, Dundee, "Fan for Displaying Photographs."—January 29th.

1,562. T. STANWAY, 24, Cauldon Road, Hanley, Staffordshire, "Supports for Photographs while under Manipulation."—January 29th.

1,600. E. T. PERKEN, F. L. PERKEN, and A. RAYMENT, 34, Southampton Buildings, London, "Magic Lanterns."—January 30th.

1,631 J. J. ATKINSON and R. W. BARNES, 6, Lord Street, Liverpool, "Displaying Photographic Backgrounds."—January 30th.

1,715. M. A. WIER, 3, Palace Grove, Upper Norwood, "Exposing a Succession of Films."—February 1st.

1,747. W. HERBERT, Waltham House, Suffolk Road, Cheltenham, "Time-piece Regulator to Turn on and Lower Gas at any Time Required."—February 1st.

Specifications Published.

2,623.—*14th February*, 1889. "Flash Lamp." JOHN LEISK, 169, Commercial Street, Lerwick, Shetland, Merchant.

My invention relates to a new or improved form of flash lamp, for the rapid or instantaneous combustion of magnesium powder applicable to photographic or other purposes, whereby the powder is propelled by centrifugal force outwards, equally all round, from the surface of a circular horizontal rapidly revolving disc, into a suitable flame or flames completely surrounding the said revolving disc, thus securing the total combustion of the metallic powder under conditions favourable to obtaining the maximum of incandescence, the result being an instantaneous flash of actinic light circular or globular in form and many inches in diameter, which, from its large area and diffusive power, is eminently suitable for photographic purposes. All in contra-distinction to the methods heretofore used of projecting the magnesium powder by means of an air current into a suitable flame, either horizontally, obliquely, or vertically, by which mode, in some instances part of the metallic powder passes through the flame unconsumed, and in all the cold air introduced into the flame tends to disturb the same, lowers the temperature, and prevents the maximum incandescence of the magnesium powder used.

By one arrangement my invention may be constructed as follows :—

A bed plate of metal or other suitable material, and which may be five inches square, is prepared, and on each corner of the same is erected rigidly a stout pillar one and a quarter inches high. A second plate, of same size as the first, is now placed on the top of these pillars, to which it is attached by screws or otherwise.

Pivoted to the centre of the lower or bed plate, and rising perpendicularly through an opening in the centre of the upper plate, is an arbor or spindle, about three inches long, on the upper end of which is rigidly fixed, at right angles by its centre, a circular metal disc about one and a half inches in diameter, the said arbor being fitted so as to revolve easily, and being provided with the necessary collars or shoulders to prevent it leaving its bearings.

To the lower part of the said arbor is attached a coiled spring for revolving the same, and also a ratchet wheel and suitable detent for stopping the spring when wound up.

By another method an india-rubber band may be substituted for the coiled spring.

There is also attached to the bed plate a suitable trigger arrangement, brought by pneumatic or other means under the control of the person using the lamp, by which the detent can be instantly removed from the teeth of the ratchet wheel when a flash is required to be made.

Resting upon the upper plate is a circular spirit lamp or burner, made of metal in the form of a flat, hollow ring two and a half inches in diameter, one and a quarter inch broad, and one eighth of an inch or more in thickness. The wick of this lamp, preferably of asbestos, protrudes from the upper open edge of the ring aforesaid, the other edge being closed and resting upon the plate, while a small capped reservoir at the side, connected to the ring or burner by a short tube, supplies the wick with spirit. This circular lamp or burner is attached to the upper plate in such a manner that it shall surround equidistantly the circular disc and arbor before mentioned, with the surface of the wick at a level one half of an inch below the upper surface of the said circular disc, the part of the top plate thus enclosed being freely perforated so as to admit a free current of air from below between the circular disc and the spirit lamp wick. An annula cap for extinguishing the spirit lamp is also provided.

By another arrangement a circular Bunsen burner or circle of gas or other flames may be substituted for the spirit lamp in conjunction with the revolving mechanism before described for igniting magnesium powder and producing a flash.

To use a flash lamp as before specified : the lamp is first filled with methylated spirit. The spring is then wound up by turning the circular disc at the top of the arbor. The charge of magnesium powder, which may be three grains or more, is then spread on the upper surface of the aforesaid disc, and the spirit lamp lit ; the detent is now withdrawn from the ratchet wheel, when the coil spring thus suddenly released, causes the arbor and disc instantly to rapidly revolve on its axis, and by the centrifugal force thus generated to scatter the charge of magnesium powder into the adjacent flame of the lamp, thereby producing an instantaneous flash of maximum size and brilliancy with a minimum of powder used.

Having thus described my invention, the chief feature of novelty of which consists in utilizing centrifugal force to project the magnesium powder into one or more suitable flames, the mechanism here described for carrying out that principle may be somewhat varied in details or size ; the measurements before given being merely relative, must be varied to suit other sizes of flash lamps.

When used for taking photographic portraits a suitable reflector and diffusing screen should be used in conjuction with the lamp herein described.

2,723.—*February 16th*, 1889. "Controlling Exposures when Using-Flash Lamps." FREDERIC WILLIAM HART, 8 and 9, Kingsland Green, London, Manufacturer of Scientific Instruments.

The object of this invention is for controlling the exposure of the sensitive photographic plate or plates. in lighting single or grouped objects to be photographed by flashing light or lights ; it has been found that some persons and lower animals involuntarily move either the body or more frequently close the eyelids very shortly after the flash commences ; to render this movement of little or no moment I employ a stop-cock with two separate ways, or two separate stop-cocks actuated simultaneously by one lever or turnkey ; each way is connected with a separate air chamber in which is air or gas under pressure : one conducting tube for air goes to the flash-lamp, and the other to the pneumatic release of an exposing shutter ; their relative times of discharge are so adjusted that the shutter exposures take place at the early part of the flash or combination of flashes, and according to the volume of light provided so the actual exposure of the plates may be reduced to a very small fraction. It has been found impracticable for many to accomplish the double movement for flash and shutter by simple hand pressure on balls at the right instant of time. It has also been suggested to connect the exposing shutter-release with the same air-ball or chamber that discharges the magnesium, but as the air does not escape at the shutter's release, but exerts pressure, and

on the other hand the tube to the flash-lamp is practically open, it is seen that such an arrangement could exert no practical pressure at the shutter-release.

The inventor claims :—

1st. The combination of a two-way stopcock, pneumatic release-shutter, and flash-lamp or lamps.

2nd. The combination of two air or gas chambers and stop cocks in line, the discharge ports of the plugs being adjustable one to the other by means of a graduated disk and index.

3rd. The combination of a two-way stopcock with separate air chambers, valves, and air compressing balls or pumps.

4th. The combination of two separate air chambers, each with stopcock and their plugs in line, their axes connected through a prolongation and set screw, or the stopcocks placed parallel, and worked by an intermediate tooth wheel.

15,289.—28*th September*. 1889. "Shutters for Photographic Apparatus." Newnham Browne, 73, Cheapside, London, Fellow of the Institute of Patent Agents, communicated from abroad by Richard Kindler, Friedrich Str. 29, Dresden, Mechanician and Optician.

The invention relates to shutters for photographic apparatus, which contain two plates, one placed over the other, and capable of longitudinal motion with reference to one another, each plate having an aperture, and which two plates in their positions at the end of their stroke close or cover the lens, whilst when the plates travel from one extreme end of their motion towards the other, they uncover or expose the lens for an instant at the time when the apertures in the two plates are coincident.

The improvements relate partly to the mechanism and adjusting devices causing and controlling the motion of the shutter-plates, and partly to the arrangement of the plates themselves, whereby the manner in which the exposure is effected is controlled.

Mr. E. Muybridge will, we understand, shortly give a second lecture in Manchester on "Animal Locomotion."

Specimens of the late Mr. Rejlander's photographs can be obtained made up in albums from Mrs. Rejlander, 2, Waverley Villas, Bruce Grove, Tottenham.

A contemporary says that a mother whose sons were tending cattle on her estate, named the estate "Focus," because, she said, it is where the sons raise meat.

A light basket-case for a half-plate camera has been received for inspection. Shortly we shall return to the subject of basket-work for photographic purposes, to bring forward some fresh points.

The annual dinner of the Photographic Society will be held on February 10th, at 6.30 p.m., at the Café Royal, Regent Street, London. Tickets, six shillings each, may be obtained from Mr. William England, 7, St. James's Square, Notting Hill, London. Evening dress optional. Ladies will be present.

In our last number, we stated, in a paragraph about illustrated journalism, that *The Daily Graphic* had to apologise for a blunder in regard to one of its illustrations. We find that this statement is not correct, and accordingly express our regret at its insertion, and offer to our contemporary our sincere apology.

Proposed Lantern Club.—Mr. T. H. Holding, whose letter respecting this project appeared in our issue of January 17th, writes as follows :—"Permit me to notify that a meeting will be held in the Upper Regent Saloon of the St. James's Hall Restaurant, (Regent Street and Piccadilly), on Thursday, February 20th, at 8 p.m. I have to ask those who can attend to send in their names either to the Hon. Slingsby Bethell, Chelsea Lodge, Chelsea, or to myself, before that day. Possibly there are those who will have engagements, and, nevertheless, are in sympathy. We shall be glad also to have a word from them before the 20th, as it will be useful. Any suggestions which any gentleman may have and will embody in a brief letter, shall be put before the meeting.—T. H. Holding, 46, *Chesilton Road, Fulham, S. W., 7, Maddox Street, W.*"

Proceedings of Societies.

The Camera Club.

On January 30th, Mr. T. R. Dallmeyer read a paper entitled "Practical Interpretations of the Law of Conjugate Foci." Mr. Lyonel Clark occupied the chair.

The Hon. Secretary handed round a matt surface silver print, sent by Mr. Quick, in which the note paper on which his letter was written had been sensitised and printed upon with good results.

Mr. Dallmeyer showed a graphic method of illustrating the equation representing the law of conjugate foci, by the properties of lines drawn within the circumference of a circle. He also showed applications of the law of conjugate foci, whereby the purposes of a view-meter were served, and also to give indications of the object focussed for being actually in focus. These included one by Mr. Berthon, one mentioned by Mr. Traill Taylor, and one described and illustrated by an instrument by Mr. Dallmeyer himself.

The subject on Thursday, February 13th, is "Landscape," when a paper will be read by Mr. Graham Balfour.

London and Provincial Photographic Association.

At the meeting on the 30th ult., Mr. T. E. Freshwater occupied the chair.

Mr. A. Cowan said that he had continued his experiments with a view to test what part the alkaline salts played in the developer in connection with and without sulphite of soda. Two plates were shown, one developed with a ten per cent. solution of sulphite, and the other with a twenty per cent. solution of sulphite, two grains of pyro being used in each case. The increased strength of sulphite added considerably to the density of the image.

Mr. A. Haddon was still of opinion that the developing power of sulphite was due to its degree of alkalinity. Three solutions he had tested, all indicated the presence of excess of alkali.

Mr. J. B. B. Wellington exhibited a 15 by 12 collodio-bromide plate, showing after development innumerable black spots ; these spots were absent in small plates coated with the same emulsion.

Mr. W. E. Debenham thought the spots might be caused by the plate not having been thoroughly clean.

The Chairman drew attention to a report in one of the journals of the bursting of a gas cylinder. Remarking upon the danger of sending out both oxygen and hydrogen in black bottles, which in many instances was done, he would urge upon all users of the two gases to insist upon having these gases delivered in red and black bottles.

Dundee and East of Scotland Photographic Association.

February 6th.—The first popular lecture this season, under the auspices of the above Association, was given in the Kinnaird Hall on Wednesday by Mr. J. W. McCall. The scenery illustrated was that of Orkney, Shetland, and Greenland ; the pictures had been prepared by Messrs. Valentine and Sons. A large screen was used, some thirty feet square, and special lantern arrangements had to be made.

Starting from Kirkwall, with its celebrated cathedral, the various islands were visited in turn, and the Orkney group was next shown, besides views of Lerwick, Stromness, and Scalloway, the old castles and ruins found on the various islands, and scenes illustrative of the habits and customs of the natives. The series closed with views of the Tay and Forth Bridges; several other large structures were also shown by way of contrast.

Sheffield Photographic Society.

The monthly meeting was held on Tuesday evening, the 4th inst., at the Masonic Hall, Mr. B. J. Taylor in the chair.

A series of 180 slides was passed through the lantern, which was manipulated by Mr. G. Bromley.

On the table were laid the competitive enlargement pictures, prizes for which had been given.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

AT the meeting held on the 30th January, at 3, Lord Street, Mr. PAUL LANGE occupied the chair.

Messrs. J. W. Warburton, M.D., John Price, M.I.C.E., Rev. G. F. Wills, H. Cope West, E. S. Gladstone, B. Cooksou, and J. Watkins were elected members.

Mr. P. LANGE spoke at some considerable length as to the benefit derived from Conventions generally, more particularly when attention was drawn to something really practical. He advocated that a better feeling should be cultivated with kindred Societies, and drew attention to the Chester Conference to be held shortly, of which Mr. F. Evans was the Secretary.

A short discussion on the subject of "The Best Lenses for Detective Work" then followed, in which Messrs. Sayce, Wilkinson, Earp, Lange, Kirby, Williams, Tomkinson, and Swinden took part. It was pretty generally allowed that an ordinary French lens, working at *f* 11 with a rapid shutter, gave good results; especially so when working with a lens covering the next larger sized plate than the one used.

Mr. W. J. ARCHER exhibited a selection of Woodbury lantern slides and a series of views of the Paris Exhibition, including a few panoramic slides, which gave great satisfaction.

The exhibits consisted of snap shots by W. Wilkinson, on glass and film; new lantern slide carrier, by W. J. Chadwick (Manchester); and Mawson and Swan's transparency and photograph frame.

The twenty-sixth report of the above Association sets forth that the President and Council have much pleasure in congratulating the members on the continued prosperity of the Association. In previous reports the attention of the latter had been drawn to the years 1883 and 1884 as phenomenally prosperous ones, showing in the former 32 new members and in the latter 37—an increase of 69, and accounted for by the increased facilities offered to amateurs by the introduction of the gelatine dry plates.

In the years 1888 and 1889, there has been a yet greater increase; in the year 1888 there were 49 new members, and in this year 74, showing an accession of 123, or an increase as compared with 1883 and 1884 of 78 per cent. In 1889 alone the number exceeds that in 1883 and 1884 together. The accession to the roll of membership has been the highest yet attained, and the total number of members 238. There can be little doubt that this increase is in a great measure due to the prominence the Association secured in connection with its exhibition held in the Walker Art Gallery in 1888, and to the securing of club rooms situated in the centre of the city, giving members such convenience, comfort, and advantages of association as cannot be surpassed by any similar photographic society in the Kingdom.

The following is a record of the numbers joining the Association during each year of its existence, viz.:—1863, 17; 1864, 4; 1865, 1; 1866, 0; 1867, 1; 1868, 0; 1869, 3; 1870, 1; 1871, 1; 1872, 3; 1873, 2; 1874, 4; 1875, 2; 1876, 2; 1877, 7; 1878, 7; 1879, 6; 1880, 6; 1881, 8; 1882, 19; 1883, 32; 1884, 37; 1885, 23; 1886, 18; 1887, 19; 1888, 49; 1889, 74.

The number of members at the commencement of the year 1889 was 181, and 17 have left the Association, thus making the net number at the present time 238. The numbers on the books for the last six years are as follows:—In 1884, 138; 1885, 134; 1886, 140; 1887, 144; 1888, 181; 1889, 238. There have been two removals by death, viz.:—W. P. Riley, a member of the Council, and one of the most promising and active members; and C. J. Renfrey, who had but recently joined the Association. The Association has also lost the services of two valued members of the Executive, owing to business appointments removing them from this part of the country, viz.:—H. N. Atkins, Vice-President; and W. A. Watts, M.A., Hon. Secretary. These vacancies have been filled by P. Lange to the former, and W. Hughes to the latter. W. H. Tyerman and C. A. Timmins have been elected to fill the other vacancies. The year 1889 is prominent in the records of the Society on account of the permanent club rooms which have been so happily acquired. The committee appointed to select and furnish suitable premises for the club rooms consisted of the following members:—Messrs. J. H. Day, J. Earp, A. W. Cornish, A. W. Beer, B. J. Sayce, and G. H. Rutter; but before any action was taken Messrs. B. J. Sayce and G. H. Rutter retired from the Committee, and Mr. H. Lupton was elected in their place. The Committee thus formed was subsequently appointed as the "House Committe." Owing to the substantial balance from the Exhibition account of £257 18s., and the ordinary balance on the 24th November, 1888, of £77 8s. 5d., making £335 6s. 5d., the long-desired wish of many members has been attained. Thanks to the House Committee and to Mr. Day, their Secretary, a number of works of art have been secured for the adornment of the room from Messrs. H. P. Robinson, "Carolling," and own etching; F. M. Sutcliffe, "Water Rats;" R. Keene, "Tissington Spires;" A. Pringle, "Dove Dale;" Rev. H. B. Hare, "Thirsty Moments; W. W. Winter, J. P. Gibson, B. Wyles, H. S. Mendelssohn, M. Auty, Rev. H. J. Palmer, and F. Whalley. The rooms have been well furnished, and the comfort and convenience of members have, as far as practicable, been attended to. An enlarging camera has also been provided for the convenience of members, and has been of service to many. The entrance fee on membership has been increased to £1 1s. The Treasurer's account shows a balance remaining to the credit of the Association of £48 13s. 8d. after investing the sum of £194 14s., and writing off £14 5s. 4d. as depreciation on club room furniture, &c. There has been a great increase and improvement in photographic work done by the members this year, and it is encouraging to note that, instead of the higher class of results coming only from a limited few as heretofore, there is now a fair distribution amongst the younger members. Nothing of a very startling character has been submitted to photographic workers generally during the year. Developers are now fairly divided in numbers of their respective adherents—pyro-ammonia and hydrokinone; yet another "Richmond" has appeared in the shape of Dr. Andresen's "Eikonogen," of which we may hear more next year. Celluloid films have apparently displaced "paper"-work to a great extent, and have recently been much improved. Platinotype has been increasingly adopted, the process being simple, results artistic and permanent, and the price of the paper has been greatly reduced. Much attention has been directed to "detective" or hand-camera work, though, as yet, with but limited success; still, the difficulties attendant upon this interesting branch of photography have been met with praiseworthy determination, and many ingenious devices and improvements have been affected, notably the camera invented by two of our members—Messrs. Swinden and Earp—which obtained the only medal given for apparatus by the Photographic Society of Great Britain at the recent Exhibition at Pall Mall, keeping up the traditions and *prestige* of this Society in the advancement of photographic art. Early in the year we received from the Boston (U.S.) Camera Club a series of lantern slides, in trust, for exchange with other societies, entitled "Illustrated Boston," and which has been *en tour* during the year. The series was carefully prepared, and reflects the highest credit on the Boston Camera Club for the manner in which the slides were completed as a representative set. The idea was one worthy of following, and the Council has requested the members of this Association to make up a Liverpool set as a "return" series for the Boston Club, and also a representative set for reciprocal exchange with other societies in our own country, especially as so many societies have already adopted the plan as a great incentive to individual work, and an encouragement to the respective societies in a new branch of activity. The meetings have maintained their interest throughout the year. Papers have been read and demonstrations given by Messrs. W. Tomkinson, on "An Easter Trip to the South of France and Northern Italy"; F. A. Bartlett, M.A., on "A Month in Normandy and Brittany"; J. Earp, on "Ten Days in Holland and Belgium with a Hand Camera"; S. J. H. Dearle, on "English River Scenery"; P. Lange, the representative series of lantern slides sent by the Birmingham Society; W. A. Watts, M.A., the "Illustrated Boston" slides sent by the Boston (U.S.) Camera Club; F. T. Paul,

F.R.C.S., a demonstration on "Micro-Photography"; Vero C. Driffield, paper on the "Actinograph"; G. A. Kenyon, M.D., on "Film Photography"; P. Lange, demonstration on "Enlarging"; H. Wilkinson, paper on "The Intelligent Use of the Detective Camera;" G. E. Thompson, on "Rambles along the Riviera, from Marseilles to Genoa;" J. S. Brown, "From Cairo to the Cataract;" Messrs. Sinclair, Tomkinson, and Tunstall, on "Normandy and Brittany;" while discussions have taken place upon "Cloud Negatives," "Warm Tones by Development in Lantern Slides," "Eikonogen as a Developer," and also upon the various demonstrations, papers, and novelties submitted to the meetings. Much interesting work has been shown and other exhibits brought forward by Messrs. W. Rogers, E. Roberts, S. J. H. Dearle, P. Lange, J. Comber, H. Wilkinson, A. W. Beer, W. Tomkinson, T. S. Mayne, C. A. Timmins, E. M. Tunstall, J. L. Mackrell, J. A. Forrest, H. Holt, R. Crowe, B. J. Sayce, W. C. Bustard, A. F. Stainstreet, and others. The social element has also received attention. Four smoking concerts have been held, and largely attended.

The annual competition for Prints, Enlargements, and for Lantern Slides has received increased attention from the members this year, and some excellent work has been submitted.

The thanks of the Association are due to the following judges, viz.:—*For Prints and Enlargements*—G. Watmough Webster, F.C.S., John Finnie, and E. Rimbault Dibdin. *For Lantern Slides*—G. E. Thompson, Paul Lange, W. D. Mead, and E. Landseer Grundy.

The judges' award is as follows:—

		Sets No.	Name.
Set of six prints, half-plate and under...	*Silver Medal*	11	T. B. SUTTON.
	Bronze Medal		W. TOMKINSON.
Set of six prints, over half-plate ...	*Silver Medal*	4	J. L. MACKRELL.
	Bronze Medal		D. CUNNINGHAM.
Set of two enlargements	*Silver Medal*	4	F. K. GLAZEBROOK.
	Bronze Medal		J. L. MACKRELL.
Set of six lantern slides	*Silver Medal*	23	A. J. CLEAVER.
	Bronze Medal		T. B. SUTTON.

The excursions arranged for out-door photography this year have been numerous, and the following table of particulars of attendance and results will no doubt be interesting:—

Date.		Place.	Attendance.	Exposures.
April	22	Ludlow and District ...	*	—
May	4	Rossett	15	56
	18	Instantaneous—River	7	60
	27	Haddon Hall and Bakewell ...	19	150
June	1	Burton and Ness	15	102
	10	Dolgelly	*	—
	15	Speke Hall and Old Hutte ...	49	229
	26	Emral Hall and Wrexham	*	—
	29	Bollin Valley	16	106
July	13	Chester	7	20
	22	Pont-y-Pant	6	50
	29	Knowsley Park ...	*	—
August	5	Boscobel, Tonge, and Lilleshall Abbey	5	20
	10	Eastham Rake...	17	60
	24	Raby Mere	12	60
Sept.	2	Sandbach and Moreton	*	—
	11	Excursions ...	168	913
Last year ...	3	,, ...	49	362
Increase ...	8	,, ...	119	551

Arrangements were made for sixteen excursions, but five (*) had to be abandoned; the attendance at the eleven excursions was 168, and the number of exposures made was 913. As compared with last year, there is an increase in the number of those present of 119, and in the exposures 551.

The following are the officers of the Association for 1890:—*President*, Mr. Paul Lange; *Vice-presidents*, Messrs. Wm. Tomkinson, W. D. Mead; *Treasurer*, Mr. Joseph Earp, c/o Edward Thin, 3, Rumford Place; *Council*, Messrs. W. H. Tyerman, D. Lewis, C. A. Timmins, G. H. Rutter (to serve one year); R. Crowe, E. Roberts, B. J. Sayce, J. H. Sinclair (to serve two years); A. W. Beer, J. H. Day, E. M. Tunstall, J. L. Mackrell (to serve three years); *Librarian*, Mr. J. McDonald Bell; *Auditor*, Mr. A. Bradbury; *Hon. Secretary*, Walter Hughes, 3, Lord Street, Liverpool.

DERBY PHOTOGRAPHIC SOCIETY.

ON Wednesday night the members of the Derby Photographic Society held their annual conversazione at the St. James's Hall. The work of some of the members of the Society was exhibited in the room. Among the exhibits, many of which consisted of well-known local scenes, prints were shown by Messrs. Winter, Keene, Thomas Scotton, A. B. Hamilton, C. J. Chadwick, C. Bourdin, W. Hart, and others. In addition a competition had been organised by the Society, three prizes being offered for the best work by amateurs, for which the following seven entered: Messrs. F. Benrose, C. Bourdin, C. J. Chadwick, Cope, A. B. Hamilton, T. A. Scotton, jun., and G. Walker. The judges (Messrs. Simmonds and Arthur Cox) had some difficulty in making their awards. Eventually, Mr. T. A. Scotton, jun., took the first prize with a photograph of a country lane near Birmingham. Mr. Bourdin was awarded the second prize; the scene of his photograph was "Derby from Exeter Bridge," and the third prize fell to Mr. C. J. Chadwick, whose picture was a scene at "King's Mills." The judges also highly commended the work of Mr. A. B. Hamilton, who from a lady's photograph had taken the head as a statue.

In opening the proceedings, Mr. HERBERT STRUTT, J.P., delivered a brief address, and said that in an assembly like that, he should be the last person to introduce any controvertial matter or technicality, because he was fully aware of the fact that he was speaking to gentlemen who knew more about art than he did himself, and he should only display his ignorance. He thought no one present needed to be told that during the past ten years the number of amateur photographers had greatly increased, the reasons having been the great reduction which had taken place in the cost of the outfit and the simplification of the process. The result was that the number of amateur photographers was about 500 per cent. larger than it was ten years ago. He looked upon the art as one of the most fascinating that could be taken up, not only because it led one to the most interesting places, but when they had taken the photographs they could enjoy the sight of them for the rest of their lives. He had spoken of the increase of amateur photographers, and he might say that their Society, which was established in 1884, had now about sixty-five members.

During the evening Mr. F. G. PIERPOINT, of Leicester, gave an exhibition of lantern slides, executed by the members of the Society, and Mons. Julien Lachapelle a shadowgraph. In addition, Mrs. Sim, Mrs. Hamilton, Capt. Sim, and Mr. Drury took part in a musical programme.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held January 1st, President FREDERICK GRAFF in the chair.

The secretary read a communication inviting entries to the exhibition of the Worcestershire Camera Club at Kidderminster, to be held from March 1st to 15th. A prospectus accompanied the communication.

The annual report of the treasurer was presented, showing a cash balance on hand of 820.68 dollars.

The annual report of the Executive Committee was read, giving a resumé of the work of the Society for the past year. A number of valuable additions to the library had been made, and a considerable sum expended for binding of journals.

Reference was made to various papers read before the Society, to the Third Annual Joint Exhibition held under the auspices of the Society during the month of April, and to the Fall Competitive Exhibition, now in progress, from which the Honour pictures for 1889 would be selected.

The Committee on Lantern Slides reported as follows: At the Conversational Meeting, held December 18th, the interchange slides shown were those of the Syracuse Camera Club. This organization was admitted to the American Lantern Slide Interchange only this year, and their first contribution was

creditable to the members of the Club, and a pleasure to the members of this Society who saw them. There were seventy-six slides in all, most of them on gelatine dry plates, and represented a wide stage of subjects, including some fine studies in Europe.

Dr. Charles L. Mitchell showed fifty slides, on gelatine plates developed by eikonogen. The views were chiefly marine studies, made with a Hawkeye Detective Camera, and the cloud effects in most of the views were excellent.

The election for officers and committee for 1890 resulted as follows:—*President*—Frederic Graff; *Vice-Presidents*—John G. Bullock, Joseph H. Burroughs; *Secretary*—Robert S. Redfield; *Treasurer*—Samuel M. Fox; *Executive Committee*—Ellerslie Wallace, M.D., Charles L. Mitchell, M.D., Edmund Stirling.

A paper prepared by Dr. Charles L. Mitchell and Mr. John G. Bullock on the "Dangers of Flash-Light Compounds," was read by Mr. Bullock (see p. 109).

Bath Photographic Society.

January 29th.—Meeting at 10, Quiet Street, Mr. W. Pumphrey in the chair. Messrs. H. J. Lewis, H. G. P. Wells, D. Swain, and J. S. Gibbs were elected ordinary members. Messrs. Ernest Pitman and J. Day were appointed auditors.

A circular letter was read from Dr. P. H. Emerson, offering a copy of his work, "East Anglian Life," to the Society. This generous proposal was accepted with thanks.

Messrs. Dugdale and Davis then, by means of the oxy-etho light, showed a series of views representing places visited by the Society during the summer excursion.

Dr. Dutton passed round developed prints on celluloid, opal, and cardboard. He remarked that the percentage of failures with celluloid was high.

The annual meeting will be held on February 26th.

Manchester Amateur Photographic Society.

The fifth annual report was presented at the annual general meeting held at the Manchester Athenæum, Princess Street, on Tuesday, January 28th, from which we give the following:—

Eighty-six new members have joined since the fourth anuual meeting, and during the year there have been no fewer than 353 members on the books. The present actual numerical strength stands at 293 members.

The Treasurer's account shows a balance in hand of £44 8s. 10d., as against £41 3s. 9d. last year.

An addition of 17 volumes has been made to the library during the year, making a total of 171 volumes. The number of books issued to the members was upwards of 250.

Since the issue of the last report there have been added to the apparatus belonging to the Society a fine lime-light enlarging lantern, at a cost of £13 (exclusive of the condensers, which were presented by a member), a lime-light lantern, costing £20 8s., and a screen. In addition to the lanterns, the Society has a slide cabinet containing upwards of 300 slides contributed by members, which slides have been in much request during the year.

The Camera Club.—The *Camera Club Journal* says about the probable new premises of the Club:—"Provided that the details now under arrangement can be settled to our satisfaction, these premises will be erected to comprise five floors and a spacious basement, the entrance to the building belonging solely to the Club. The divisions into rooms will probably be as follows:—Eight or nine separate small dark rooms, work-room and storage, a waiting-room and porter's lobby, large meeting-room, still-room and offices, library, billiard-room, workshop fitted with lathe, &c., committee and secretaries' rooms, grill-room, kitchen, resident porter's rooms, studio and enlarging room, and lead flats."

Received.—From Messrs. Perken, Son, and Rayment, a simple and inexpensive magnesium-ribbon lamp—an improvement on one figured and favourably noticed in these columns about a twelvemonth since.

Answers to Correspondents.

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

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

Ligroine Lamp.—A correspondent in Vienna has been good enough to seek out the maker of this incandescent lamp, which costs 22 gulden (about £1 18s.) all complete, with benzoline boiler, gas burner, and a spare Welsbach gauze. Our friend saw it in action. The power is said to be 100 candle-light, and it works very efficiently, bearing out Dr. Eder's report of it. The maker is Herr C. Fabricius, II Erzherzog Karl Platz, No. 16, Vienna. Benzoline vapour mixed with air is burnt at a jet surmounted with a Welsbach incandescent gauze, giving a brilliant white light. See Year-Book, page 170.

Pr. O. S.—The best hand camera. If you are intent upon using glass plates, the camera mentioned is as good as any, but the most portable form is now the new Kodak No. 2, worked with a roller of flexible celluloid. This gives circular pictures of 3½ inches diameter, very suitable for lantern transparencies, but of course not answering your requirement of taking negatives 3½ by 5 inches.

Noriam.—Plate-glass for studio roof. Under the special circumstances of your case, being already in possession of a large square of plate-glass, it might be well to make it do duty as part of the roof of your studio. The lower slope, and not the top light, is certainly the best place to put it, for in this position it may rest on a faced iron horizontal ledge fixed directly on the iron support as sketched. With regard to the probability of its changing colour, examine carefully the edges with a white card behind to see whether, in the protected parts under the rabbet, where it was originally screened from sunlight exposure, there is the slightest indication of a paler tint than in the rest of the glass, and be guided accordingly.

M. W.—Your letter was duly received and acted upon a fortnight ago. You will know the result next week in ordinary course.

W. T. D.—The back numbers of the *Photographic Times* (1889) are not just now accessible at the Patent Office Library; they have been sent away to be bound. There is no English patent in the name of F. Winterhoff. You probably saw a notice in this column last week, asking for information as to present address.

Residues.—You are using vastly too much chrome alum in your fixing bath, and every fresh addition of potassium sulphide merely precipitates the oxide of chromium along with the sulphur. But the silver is thrown down first, and this with a moderate quantity. When you smell sulphuretted hydrogen in the liquor you have added enough, or you can tell by the colour of the precipitate. The zinc method of reduction is slow and unsatisfactory.

W. H. L.—Gelatino-Chloride Printing-Out Process. Dr. Barker's formula:—

Nelson's No. 1 gelatine	175 grains
Coignet's gelatine	175 ,,
Sal ammoniac	36 ,,
Rochelle salts	100 ,,
Nitrate of silver	150 ,,
Alcohol	1 ounce
Water	10 ounces

Soak the gelatine in part of the cold water, then heat to 100° Fahr. with all ingredients added, and maintain at this temperature for ten or fifteen minutes after everything is dissolved. See also page 201 of the Year-Book, for Ashman and Offord's formula for a Citro-Chloride paper.

Flux.—In addition to the details given last week, we may refer you to "The Reducer's Manual and Gold and Silver Worker's Guide," by Victor G. Bloede, published in New York (J. H. Ladd), and to be had of Messrs. Trübner and Co. The little book is full of practical details which cannot fail to be of service to you.

Other correspondents in our next.

PENZANCE HARBOUR

Reproduced by Waterlow & Sons Limited from a photograph by Col. W. Noverre

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1641.—*February* 14, 1890.

CONTENTS.

FOCUSSING APPLIANCES.

PLENTY of room exists for improvements in focussing appliances for photographic cameras, and a recent invention in connection therewith made by Mr. Frank Bishop, of the firm of Messrs Marion and Co., may be explained by the aid of the accompanying diagrams. It consists of an ordinary focussing glass and tube, and to this larger tube a smaller one is soldered, as in Fig. 1. The smaller tube ends in a small india-rubber cup, which, when wetted, will hold on by the pressure of the atmosphere to the polished side of the glass focussing screen, and can readily be pushed about with an easy, sliding motion, to any part of the surface; in short, it is on the principle of the "sucker" used by schoolboys. The object of the invention is to allow the photographer the free use of both his hands while focussing, instead of employing one of them to retain the focussing glass in position, and this purpose it achieves admirably. Fig. 2 represents the focussing glass holding on, limpet-like, to the screen, as it does when in use. It adheres with considerable tenacity.

Fig. 1.

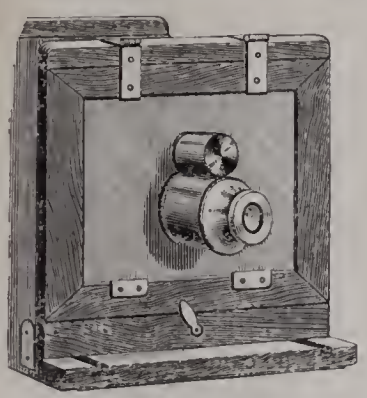


Fig. 2.

The method recommended in another column by Mr. Varley of using ground glass to ascertain the exact amount of subject upon the plate, and afterwards a plain piece of glass with scratches upon it to get a critical image, is often employed in photo-micrographic work; but it is doubtful whether it will ever come into general use with ordinary cameras, especially those for outdoor purposes; in the latter case it would form an item adding somewhat to the weight of the instrument, and be a step in the direction of complexity rather than of simplification. Probably what may be called a "piebald" screen would answer better, that is to say, a screen of finely ground glass, with perfectly transparent spots a quarter or a third of an inch in diameter scattered over its surface. The ground glass would give the general view, and the spots would favour the easy focussing of a critical image.

A good focussing screen made on the principle of those now in common use would consist of much finer ground glass than such as is ordinarily employed, and more approaching in appearance unground glass. With two lenses on Ramsden's principle mounted in one tube, a focussing glass is formed transmitting much more light to the eye than those at present in use, and when employed to view the image upon exceptionally fine ground glass there is a pleasure and ease in focussing to which the majority of photographers are entirely unaccustomed; when once they have tasted the luxury they will never return to the present appliances. Now that the magnesium light is coming into more general use, and that the operators have usually to focus beforehand by gaslight or lamplight, the desirability of being able to get a brilliantly illuminated critical image when focussing, is all the more palpable.

THE "PHOTOGRAPHIC NEWS" SUPPLEMENT.

TO-DAY we issue as a Supplement a photo-mechanical reproduction, on a reduced scale, of the photograph of Penzance Harbour, by Col. W. Noverre, which was so much admired at the last Photographic Exhibition. The original was upon very rough drawing paper, and was of a terra-cotta red colour.

ATHANASIUS KIRCHER, THE INVENTOR OF THE MAGIC LANTERN.—No. I.

BY JAMES MEW.

SOME years ago* an occasion was taken to notice in the columns of this paper a communication made to the London and Provincial Photographic Association by Mr. W. H. Harrison, containing many interesting and historical notes on the optical or magic lantern. In this communication we learnt that the magic lantern was invented by Athanasius Kircher in the year 1646. A few lines, which many of the present readers of the PHOTOGRAPHIC NEWS have never seen, and many others perhaps forgotten, may be here copied out of that interesting and ably conceived communication. "There are," says Mr. W. H. Harrison, "speculations that the magic lantern may have been known before Kircher's time. Some have ascribed its invention to Roger Bacon, who, in his 'Discovery of the Miracles of Art, Nature, and Magic,' written about the year 1260, displays knowledge of the uses of lenses. Others have speculated that it may have been known to Egyptian hierophants, because they understood the properties of concave mirrors. Cellini, who died about 1570, describes spectres which had been seen in ascending smoke, and it has been said that these must have been produced by an optical lantern. All this is but speculation. The one thing which can be clearly seen by us when peering into the mists of antiquity is that Kircher gave the first clear description of an optical lantern, and was personally proud of its invention." But whether Kircher be the inventor of the magic lantern or not, supposing even it could be demonstratively proved that this machine—which, in the English Patent Office, is not entered under the heading of Optics, but, curiously enough, by a strange system of governmental classification, under that of Toys—was the invention of another, and not Kircher, Kircher would still be of the greatest interest to photographers from his remarkable work, written in Latin at Rome, in the middle of the seventeenth century, entitled "The Great Art of Light and Shade." This large folio volume, digested into ten books, contains so many matters of interest to photographic artists that we propose to reproduce a portion of it in these pages. We will preface this reproduction with a short biography of the author.

"In the year 1602, on the second day of May, on the third hour after midnight," says Kircher in the story of his own life, entitled by him 'The Life of the very reverend Father Athanasius Kircher, of the Society of Jesus, a man most celebrated throughout all the world,' on the festal day of Saint Athanasius, was I by my parents, John Kircher and Anna Garsekin, catholic persons and most devoted to divine worship and pious works, brought forth into this common air of calamity in the town of Geyssen, distant some three hours' journey from Fulda." He speaks of his father as a high-souled person who, refusing all gifts from the governing Prince, constantly asserted that one ounce of liberty, the wise man's true delight, was of more value than kingly honours of many thousand pounds.

Athanasius was the youngest of nine children. His name was derived from the great veneration in which his father held that saint on account of his constancy and imperturbable fortitude in the Arian persecution. In his tenth year the young Kircher learnt music, Latin, and geography, and afterwards was sent to the Jesuit College at Fulda, where he also acquired Greek and Hebrew.

Kircher speaks at some length of the weekly purgation of his conscience by confession, and of the Divine aid by which he was encouraged to fight against all the enticements of puerile play, and all the idle occupations which are wont, in ill-conditioned bosoms, to constitute childhood's chiefest charm. The Divine clemency preserved him, he tells us, from manifold dangers. On one occasion—it was on a bathing excursion, chosen with some apparent heedlessness in the vicinity of a water mill—Kircher was sucked under the wheel by the current, but emerged uninjured on the other side, to the astonishment of himself and of his companions. Another miracle happened in his favour on the day of Pentecost, on which a procession took place to consecrate certain fields by sacerdotal aid from satanic storms. This solemn lustration was succeeded by a horse race. Kircher, being in the first rank of the spectators, was pressed by a sudden impulse of those behind him into the middle of the racecourse just as the horses were about to pass. "I lay," complains the unhappy Kircher, "having commended myself to Supernal protection, with a contracted body and prone till all the horses had passed over me, after which I arose safe and sound." On being asked how he had managed to escape, he replied that there was no diminution in the power of Him who delivered Jonah from the ingurgitating whale, Tobias from the devouring fish, and Daniel from the ravening lions. On a third occasion Kircher was lost in a wood at night, and was so terribly frightened in consequence that he determined to renounce this wicked world and enter a religious order. He chose that of the Jesuits, and was admitted a novice at Paderborn on the 2nd October, 1618. Here he studied logic, physics, mathematics, and philology.

The greater part of Kircher's autobiography is made up of most disastrous chances, of moving accidents by flood and field, from all of which he, like the Moor, escaped scot free. His descriptions of his dangers, from which he considers himself liberated by Divine intervention, are sometimes highly picturesque. He gives, for instance, a very graphic account of how he avoided on one occasion his enemies by a flight in the winter time. The ways were deep with snow, which covered his knees; dire hunger assailed his stomach, a cold wind froze his extremities. His sole food was a loaf of barley bread mixed with a great quantity of bran which, not without difficulty, had been extorted from a surly peasant; bread of the very worst condition, and yet to him in his famished state, delicious beyond all compare. It is a long story, but it ends well. He escapes his foes after persistent prayer, though his knees are trembling, the rest of his body—Kircher writes "my whole body," but this must be an error arising from some mental confusion induced by a reminiscence of his agony—rigid, and his face a livid blue. One more of these disastrous chances will probably suffice the reader's curiosity. It is told at some length by Kircher, who insists on every circumstance of his peril with naive minuteness. We can find room here only for an abstract or a digest of this particular danger, a danger so formidable that he cannot call it to mind without much horror. It happened in a garden of the Jesuits' College at Avignon, to which he had retired in 1635 after the celebrated thirty years' war which Gustavus Adolphus of Sweden had carried on in Germany, where Kircher was professor of philosophy and oriental languages at the College of Wirtzburg, in Franconia.

In the garden of the Jesuits' College at Avignon was a large water wheel, placed between two high walls, and

* "Historical Notes on the Optical Lantern," by W. H. Harrison; PHOTOGRAPHIC NEWS, Dec. 23, 1887, p. 803.

driven round by horse power. The wheel stood in a narrow pit of deep water, and, raising the fluid in buckets, cast it into a stone basin, from which it was distributed by channels through the whole garden. The ill-starred Kircher, while standing near this water machine involved in thought, was suddenly knocked down by the pole to which the horse was attached, and became, by some untoward destiny, inextricably involved with the machinery. "The wheel continually moving, I was," says Kircher, "nowhere able to fix my foot, nor was it allowed me to escape sideways, on account of the close proximity of the walls which, within a little, touched the wheel. Being in this extreme necessity of peril I implored the assistance of my companion: but he, being occupied in a remote part of the garden, gave no heed to my clamour, what time I was revolving with the wheel, and was expecting death with every moment." Then, says this victim of accidents, *solita fiducia ad Deiparam confugi*, whereupon the wheel incontinently stood still, and Kircher, who by this time was up to his neck in the water, managed to clamber out of his difficulty and find a way to escape.

With the good Jesuits at Avignon he passed two years, occupied entirely with the study of antiquities. It was during his sojourn here that he became acquainted with the learned Peiresc, who advised him to apply himself to the explication of Egyptian hieroglyphics. Elected to a Professorship of Mathematics at Vienna, he was about to return to Germany when he received an order to journey to the Vatican. He was charged by the Pope in 1637 to visit Malta. He went afterwards to Sicily and Naples, and ultimately taught mathematics for eight years in a college at Rome. Here he had a dispute with Father Maignan on the subject of the invention of an optical instrument. Kircher, on seeing it, said, "*Quod stupes, an non hoc est figura mei libri?*" What do you wonder at? Is not this the figure of my book? Whereupon one who was present, comprehending that Kircher was for taking to himself all the credit of the invention, replied, "On the contrary, it is the book of your figure (*Imo, hic est liber tuæ figuræ.*") This account is given by Bayle, who adds that the matter would have rested there had it not been that the honour of two nations French and German was supposed to be involved. After all, each mathematician may have invented the machine independently.

Kircher died at Rome on 28th November, 1680. He was a man of immense erudition, but ill-digested and uncritical, endowed with the wildest imagination, a most retentive memory, and an untiring patience. He composed twenty-two folio, eleven quarto, and three octavo volumes. It is not to be supposed that from such a mass of literature error could be excluded. One of his books, "*Musurgia Universalis*," published in 1650 in two heavy folios, treats of the principles of music. The celebrated Dr. Burney, in his criticism of this composition, speaks of it as a large work which might give occasion to one yet larger, if all the errors contained therein were duly annotated and corrected. Not only was Kircher on some occasions inaccurate—as who, indeed, is not?—but he has also been charged with too careless credulity. How far this charge is borne out by what the reader has already perused, is for him to determine; but in a story commonly adduced to support it we can find nothing to Kircher's discredit.

The Jesuit was more than ordinarily addicted to the study of hieroglyphical characters. Mystery is pleasing to most of us; for Kircher it had an especial charm. Some gentlemen—as the term was then, perhaps is now, generally understood—proposed to divert themselves at the scholar's expense. With this excellent view they caused to be cut by a common stone-cutter some fantastic, unmeaning marks and figures upon a rude block of stone, and had it buried in a spot which Kircher had been commissioned to excavate and explore. The learned antiquarian stumbled on this stone, regarded it in the light of a singular curiosity, and, enraptured with his discovery, set himself at once to work to ascertain its meaning. After several days' assiduous study, he lighted upon an elucidation satisfactory to himself, and—here the jest came in. As to whether any of the gentlemen apologised to the student for having made him their laughing stock, we consult history in vain. Perhaps the whole account, of which there is another version, is apocryphal. In the other tale we learn that one André Muller did some scribblings on a parchment, and forwarded them to Kircher as antique records; that the unsuspecting *savant* replied that they were true hieroglyphics, and sent Muller the translation.

This prefatory article cannot be concluded in justice to Kircher without a short notice of his manifold works. Casting aside some religious compositions, these may be divided into historical, antiquarian, linguistic, hieroglyphic, mathematical, and physical. Of all these the last are chiefly our concern. One of the first and rarest of his works, which, by the way, are nearly all written in Latin, was called "Magnetic Art, or Experiments on the Operations of the Magnet," published at Wirtzburg, 1631, in quarto. In an extension of this same subject he published in 1641, also in quarto, a book entitled the "Magnet," in the third part of which is a description of the Tarantula, with two portraits of him, one exhibiting his belly, the other his back, and a legend underneath declaring in a Latin hexameter that music is the only potion against the poison of his bite. Above is a geographical sketch of the places where the beast is mostly to be met with, and again above that on this full-page plate is the musical composition in which Kircher confides as a certain cure.

"The Subteranean World, in which is shown the Majesty and Riches of Nature," was published in two folio volumes at Amsterdam, in 1668. Kircher, being anxious to discover the interior of Vesuvius to see, in fact, if there was anything in it, let down a man hired for a price into the principal crater, and held him suspended there until he had fully satisfied his curiosity. In this book will be found many bizarre and apocryphal accounts of giants, dragons, devils, and men all living underground, with the secret of palingenesis, or the way to resuscitate a plant from its ashes. But Kircher's greatest work for the photographer is his "Great Art of Light and Shade," already mentioned, published at Rome in 1645. Of this book, from which it is proposed to extract much which will be interesting, there has already appeared a short notice in the PHOTOGRAPHIC NEWS (December 23rd, 1887), where we read that in Kircher's preface to a portion of the book devoted to optical instruments and peculiar kinds of cameras, he says that the secrets contained therein are by no means satanic work, but the result of study and contemplation. He adds that he has to tell of some of the rarest marvels in nature, such as will excite admiration in the minds of those who behold them, that nobody has done anything of the kind before, and that he, Kircher, made his first

experiments before any one else knew anything about the matter. There is evidently here a little side-wind directed against his worthy colleague above mentioned, Father Maignan. Other people (Father Maignan?) sometimes promised rare wonderful and unheard of things which afterwards proved all wrong, but what he (Father Kircher) had to tell would prove all right. It is at least clear that the worthy priest stood upon excellent terms with himself, and was not devoid of that self-confidence which has been said by an excellent authority to be essentially requisite to all great undertakings.

(*To be continued*).

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

FRENCH PHOTOGRAPHIC SOCIETY—INTERNATIONAL PHOTOGRAPHIC LABORATORIES—ORTHOCHROMATISM APPLIED TO THE REPRODUCTION OF PICTURES—POSITIVE PAPER WITH CHLORIDE OF IRIDIUM—NEW ENGRAVING PROCESS—PROOFS FROM ORTHOCHROMATIC COLLODION—THEORY OF CONTRETYPES—LANTERN IMAGES.

THE district photographic club of the south-east of France at Lyons has written to the French Photographic Society to announce that its photographic laboratory is at the service of members of the Paris Society on presentation of card. A similar notice comes from the Italian Photographic Society in Florence. This movement in a direction so useful to amateur photographers appears to be spreading. It is to be desired that in every part of the civilised world there were international laboratories of this kind, at the service of members, duly accredited, of all the photographic societies.

Mr. Edwards has just presented to the French Photographic Society some fresh specimens in support of the results that he obtains upon his orthochromatic plates in the reproduction of pictures. He sends an interesting note on this subject, and the specimens presented are generally speaking good. We are not the less convinced, however, that orthochromatism does not suppress the effects of reflection, for in that case it would be necessary to suppose that what the eye sees, and to the degree to which it sees it, is not rendered on the orthochromatic plate. Let us commence by saying that both here and in the Society, we discuss the matter from the purely technical point of view only. We do not know Mr. Edwards; we have no interest in being disagreeable to him, still less to speak ill of him, and when we said that the presentation was not candid (*sincère*), we merely made allusion to the proofs placed in our hands without questioning the good faith of the author of those proofs, without having the slightest intention to injure him. What interest could we have in doing so? The word *sincère* in the present case signifies real, true (*vrai*). We can make plain by an example furnished to us by Mr. Edwards himself, what we understand by the word. The example is as follows:—Mr. Edwards displayed various photographs on ordinary and isochromatic plates; amongst these photographs were two representing a vase of jonquils (a beautiful yellow flower). On the ordinary plate these flowers came out as rich black, almost *velvet black;* in the isochromatic plate the same flowers were a beautiful *white velvet* in appearance.

Well, this is not *real;* if the intention has been to force the effect, to exaggerate the contrast, the fact shows that the desired quality of scientific inter-comparability is wanting. The ordinary plate, of whatever make, will yield in the hands of any photographer a reproduction of these flowers that shall be *less black*. It suffices to expose a little longer, in order that in place of a degree of blackness answering to 100, we have, for example, a middle tone of grey of the degree 50. Now it seems to us that the ordinary plate is bad, defective in consequence of insufficient exposure; it might have been less black by half; then it ought so to have been in order that a technical comparison fulfilling the desired conditions of scientific candour might be made. As for the photograph on the isochromatic plate, it is *too white*. The plate should represent yellow more with its true value—that is to say of a light grey—evidently more closely reproducing the effect produced upon the eye by the tonality of yellow. As an orthochromatic result it is therefore defective; we should give to this too-white proof the designation 0 (Zero), answering to complete absence of black. There is thus between the two proofs exhibited a range of from 0 to 100, but if each had been made with the exact value that it might have yielded, the ordinary plate might be represented by 50 (*half as dark as it appeared*), and the isochromatic plate by 15 (*the shade of grey about equalling the apparent tonality of the yellow jonquil*), and the relation of one to the other would then not have exceeded that of 15 to 50. The effect of contrast has thus been exaggerated by 65, since it is 100 in the one case, and 35 in the other. We have set out, thus, exactly our impressions, and that is the explanation of the expresssion *absence de sincèrité*, regarding only certain results that were exhibited, and going no farther. We wish to say shortly that, in order that results of this character should be comparable with each other, it is necessary to show the best that can be done with the ordinary plate as well as with the isochromatic plate, in which case the contrast would have been less, and the result not less favourable to the employment of isochromatic plates.

In so far as concerns the reproduction of pictures, that which we criticised represents the Doge Loredano, by Jean Belin; here, again, we have not called in question the faith of Mr. Edwards in our criticism, but we have the conviction that with a longer exposure the photograph upon the ordinary plate would have been better, less harsh, less violent; with less exposure the photograph upon the isochromatic plate would have shown more pronounced relief; it would then have been less soft, less harmonious, but more true. Thus, to our thinking, the contrast has been forced in this case as in that of the flowers before mentioned. The ordinary plate is not so good as it might have been, the isochromatic one also; we have not, therefore, been shown the best possible result in the two cases; that is the origin of our impression that the true conditions of inter-comparability have not been obtained, but that is all we desire to say, using the right of scientific criticism which absolutely belongs to us.

M. Berthiot presented some beautiful prints obtained on paper containing chloride of iridium. This product promises stability in the prints, but as yet the value of the process is scarcely settled.

M. Chas. Guillaume Petit has perfected a process of typographic engraving which insures with skill the absolute purity of the whites. This is the process:—The photograph is printed on a copper plate, covered with

bitumen, and developed with essential oil, which leaves the copper bare in the absolute lights. It is washed, dried, and finally covered with powdered resin. It is then heated until a grain is perfectly formed. This dressing of resin on the insoluble bitumen has the property of rendering the bitumen soluble wherever the grain is formed. By plunging the plate again into the turpentine bath, the dissolved resin leaves a deep perforation in the bitumen. The plate is then re-coated with a solution of bichromatised gelatine; it is then exposed under the same negative by the aid of registration stops previously arranged, and is developed with perchloride of iron. In the pure whites there is no grain, and we have a plate where there is no need to have recourse to a tool in order to obtain the whites. Prints were shown in support of this process, which is very interesting, and may lead to other applications. M. Petit says that the dressing of resin has the effect of de-oxidising the bitumen rendered insoluble by light. We ought to know, in the first place, whether this insolubility proceeds from oxidation. Messrs. Chevreul and Kaiser have demonstrated that the effect caused by light is produced without the presence of oxygen, but with this reserve concerning a detail only affecting the theoretical question, we recognise the truly practical and very interesting communication of M. Petit.

M. Vallot, whose patriotism—like ours—will doubtless be attacked, presents proofs obtained with the isochromatic collodion emulsion of Dr. Albert, of Munich. As to the isochromatic properties of this emulsion M. Vallot says textually "above all, without the employment of a yellow screen before the lens, the effect is much more pronounced than with the best gelatino-bromide plates prepared either with eosine or with azaline." M. Vallot insists upon this point, which is of very great importance in his opinion, as in the reproduction of pictures the operator has a facility for varying at his will the effects of isochromatism by adding to the emulsion, as the case may require, divers colouring matters, such as cyanine, erythrosine, and chlorophyl.

M. Bordet explains how a contretype is formed when using the process with a bichromated gelatino-bromide plate, indicated by Mr. Bolas in the NEWS in 1880, and afterwards by Capt. Biny in 1882, and studied afresh by M. Balagny in 1889. According to him the theory is as follows: Bichromate in presence of light renders the penetration of solutions difficult in the insolated portions, from which fact arises the phenomenon of reversal of the image. He has verified his statements by dispensing with bromide of silver, and has obtained just the same a contretype by plunging the film of insolated bichromated gelatine into a colouring bath. From the fact of a more or less profound imbibition, according to the degree of the action of light, he obtains all the values of the negative, and the contretypes are equal to those obtained in the same way on gelatino-bromide plates. M. Vallot has also studied this question, but he has arrived, he tells us, at a different conclusion regarding the theoretical explanation.

M. Molteni presented transparencies of various tones obtained upon Ilford gelatino-chloride plates, and pointed out the different modes of development. M. Audra has done the same for the Perron plates. Shall we be accused of defamation if we timidly suggest that, in spite of all the improvements brought to bear on sensitive films of gelatine for transpareneies, we have not yet found them to equal what has been obtained on albumen or collodion?

DR. OTTO JUST.*

OUR club has to mourn the loss of an active member in Dr. Otto Just, the owner of an ocular institution in Zittau, Saxony, who died suddenly on the 5th of January last. The deceased was born in Zittau on the 7th of September, 1836, and was educated in the Gymnasium there, and afterwards at the University of Leipzig, after which he studied diseases relating to the eye under Professor Arlt in Vienna, and Professor Graefe in Berlin. In 1861 he established himself at Zittau as a surgeon and specialist for eye diseases, and a year later founded on a very small scale an institute for the cure of eye diseases. This undertaking succeeded so well that in 1869-70 he built a large house in which the Institute remained until his death. The skilful surgeon enjoyed a high place in the profession, and his reputation extended far from his own abode. Since 1886 Dr. Just occupied himself much with photography, and he joined the Club of Amateur Photography in 1887. At the Exhibition of Amateur Photographers in Vienna in the autumn of 1888, he showed a beautiful collection of landscapes, groups, instantaneous pictures, and reproductions. Dr. Just wrote articles for the *Photographische Rundschau*, having for their subject his varied experiments with Eastman's negative paper. In an early number we propose to issue one of his works as a supplement.

Although not personally acquainted with Dr. Just, we lament not the less his sudden death, which has deprived photography of so earnest an adherent.

THE SOLUBILITY OF GLASS BOTTLES.

DR. THRESH said at the British Pharmaceutical Conference, some years ago he was investigating the action of rain in certain districts on vegetation. It was supposed that some lime kilns, which had been recently erected, materially affected vegetation, and he had collected the rainfall at many different points. When he collected the rain on litmus and other papers he almost invariably found that it had an acid reaction; but, strange to say, when collected in bottles, it was either neutra or distinctly alkaline. On investigating the cause of this, he discovered that in all the bottles he employed—he tried all kinds and found the results the same—some decomposition took place in a very short time, and the free acid disappeared. His impression was that it was a decomposition of silicate of soda or of lime, in which the acid combined with the base, and the silica was thrown down. That this was the case was the more probable, because in evaporating samples of rain water he found that when collected in platinum dishes the solid residue per gallon was 1 to 4 grains less than when collected in glass, and this residue was chiefly silica. He also noticed, in making further experiments, that in titrating an acid solution, if the acid were run in until a faint tint was produced with litmus, and then the liquid were boiled for a few minutes in a glass vessel, the colour would disappear. Upon adding acid, the colour would again be obtained, which would again disappear on boiling, and so on; and he had seen students in the examination room go on repeating that process for an hour, thinking they were increasing the accuracy of the result, evidently not having observed that this naturally occurred when these solutions were boiled in glass flasks. Another thing still more interesting was this: if in one of these bottles—and they varied considerably, though they were all acted upon—a mixture practically neutral and containing tincture of cardamoms, were placed and kept in it for some time, it would vary considerably in colour in the course of, say, a month, and it was quite possible that the complaints sometimes made as to the colour of such a mixture were due to this cause.

* Translated for the PHOTOGRAPHIC NEWS from the *Photographische Rundschau*, organ of the Amateur Photographic Club in Vienna.

THE ROYAL INSTITUTION.

VI.

DR. THOMAS YOUNG'S DISCOVERIES AND PHOTOGRAPHS.

YOUNG'S researches on light were ably and briefly summarised on the 22nd of January, 1886, at the last Friday evening lecture which Professor Tyndall delivered at the Royal Institution, and whose utterances on the subject are here quoted :—

The physical meaning of all the terms applied to light was soon fixed. *Intensity* depended upon the amplitudes of the waves. *Colour* depended on the *lengths* of the waves. Two series of waves coalesced and helped each other when one was any number of complete undulations, or, in other words, any *even* number of half-undulations, behind the other. Two series of waves extinguished each other when the one series was any *odd* number of semi-undulations behind the other. But inasmuch as white light is made up of innumerable waves of different lengths, such waves cannot all interfere at the same time. Some interfere totally, and destroy each other; some partially; while some add themselves together and enhance the effect. Thus, by interference, a portion only of the white light is withdrawn, and the remaining portion is, as a general rule, coloured. Indeed the most glowing and brilliant effects of colouration are thus produced. Young applied the theory successfully to explain the colours of striated surfaces which, in the hands of Mr. Rutherfurd and others, have been made to produce such splendid effects. The iridescences on the polished surfaces of mother-of-pearl are due to the striæ produced by the edges of the shell-layers, which are of infinitesimal thickness; the fine lines drawn by Coventry, Wollaston, and Barton upon glass also showed these colours. Barton afterwards succeeded in transferring the lines to steel and brass. Most of you are acquainted with the iridescence of Barton's buttons. A descendant of Mr. Barton has, I believe, succeeded in reproducing the instrument wherewith his grandfather produced his brilliant effects.

But the greatest triumph of Young in this field was the explanation of the beautiful phenomenon known as Newton's rings. The colours of thin plates were profusely illustrated by the experiments of Hooke and Boyle, but Newton longed for more than illustrations. He desired quantitative measurement. The colour of the film was known to depend upon its thickness. Can this thickness be measured? Here the unparalleled penetration of Newton came into play. He took a lens consisting of a slice of a sphere of a diameter so large that the curved surface of the lens approximated to a plane surface. Upon this slightly convex surface he placed a plate of glass whose surface was accurately plane. Squeezing them together, and allowing light to fall upon them, he observed those beautiful iris-circles with which his name will be for ever identified. The iris-colours were obtained when he employed white light. When monochromatic light was used he had simply successive circles of light and darkness. Here then, from the central point where the two glasses touched each other, Newton obtained a film of air which gradually increased in thickness as he retreated from the point of contact. Whence this wonderful recurrence of light and darkness? The very constitution of light itself must be involved in the answer. His desire was now to ascertain the thickness of the film of air corresponding to the respective rings. Knowing the curvature of his lens, this was a matter of easy calculation. He measured the diameter of the fifth ring of the series. This might be accurately done with a pair of fine compasses, for the diameter was over the fifth of an inch in length. But it was the interval between the glasses corresponding to this distance that Newton required to know, and this he found by calculation to be 1-37,000th of an inch. This, be it remembered, is the distance corresponding to the fifth ring. The interval corresponding to the first ring would be only a fifth of this, or, in other words, about 1-180,000th of an inch. Such are the magnitudes with which we have to deal before the question "What is Light?" can be scientifically answered.

Newton's explanation of the rings, which he was the first to discover, though artificial in the highest degree, is marked by his profound sagacity. He was hampered by the notion of the "corporeity" of light. He could not get over the objection raised by himself as to the existence of shadows in a fluid medium. He held, therefore, that light was due to the darting forth of minute particles in straight lines; and he threw out the idea that colour might be due to the difference of bigness in the particles. He endowed these particles with what he called fits of easy transmission and reflection. The dark rings in his immortal experiment were produced where the light-particles were in their transmissive "fit." They went through both surfaces of the film of air, and were not thrown back to the eye. The bright rings occurred where the light-particles were in their reflective fit, and where, on reaching the second surface of the film, they were thrown back to the eye. The cardinal point here is, that Newton regarded the recurrence of light and darkness as due to an action confined to the second surface of the film. And here it was that Young came into irreconcilable collision with him, proving to demonstration that the dark rings occurred where the portions of light reflected from both sides of the film extinguished each other by interference, while the bright rings occurred where the light reflected from the two surfaces coalesced to enhance the intensity.

Young next applied the wave theory to account for the diffraction or inflection of light, that is to say, the effects produced by its bending round the edges of bodies. When a cone of rays issuing from a very minute point impinges on an opaque body so as to embrace it wholly, the shadow of the body, if received upon a screen, exhibits fringes of colour. They follow so closely the contour of the opaque body, that Sir John Herschel compared them to the lines along the sea-coast in a map. If a very thin slip of card, or a hair, be placed within such a cone, it is noticed that besides the fringes outside the shadow, bands of colour occur within it: the central or brighest band being always white when white light is employed. It is a singular and somewhat startling fact that, by the interposition of an opaque body, say a small circle of tinfoil, the point on which we should expect the centre of the shadow to fall is, by the joint action of diffraction and interference, illuminated in precisely the same degree as it is when the opaque circle is withdrawn.* In reference to the interior fringes, Young made the observation, which is of primary importance, that, if you intercept the light passing by one of the edges of the strip of card, or of the hair, the fringes disappear. It requires the inflection of the waves round both edges of the object, and their consequent interference, to produce the fringes.

Young's attempt to explain the phenomena of diffraction was a distinct advance on the extremely artificial hypothesis of Newton. Still, his attempt was not so successful as his explanation of the colours of striated surfaces and of thin, thick, and mixed plates. Here the young officer of engineers to whom I have already referred, Fresnel, entered the field. He presented in 1815, to the French Institute, a memoir on diffraction, which marks an epoch in the history of the wave theory. It is usual when such a paper is presented to refer it to a "Commission," who consider it, and report upon its merits. The commissionaires in this instance were Arago and Prony.

Arago had read the memoirs of Young in the "Philosophical Transactions," but had not understood their full significance. The study of Fresnel's memoir caused the full truth to flash upon him that his young countryman had been anticipated thirteen years previously by Dr. Young. Fresnel had re-discovered the principle of interference independently, and had applied it, with profound insight and unrivalled experimental skill, to the phenomena of diffraction. It was no light thing to Fresnel to find himself, as regards the principle of interference, suddenly shorn of his glory. He, however, bore the shock with resignation. He might have readily made claims which would have found favour with his countrymen and with the world at large; but he did nothing of the kind. The history of science, indeed, furnishes no brighter example of honourable fairness

* A similar diffraction has been proved by Lord Rayleigh to occur in the case of sound.—J. T.

than that exhibited throughout his too short life by the illustrious young Frenchman. Once assured that he had been anticipated —whatever might have been the extent of his own labours, however independently he might have arrived at his results, he unreservedly withdrew all claim to the discovery. There is, I repeat, no fairer example of scientific honour than that manifested by Augustin Fresnel.

Fresnel was a powerful mathematician, and well versed in the best mathematical methods of his day. With enormous labour he calculated the positions where the phenomena of interference must display themselves in a definite way. He was, moreover, a most refined experimentalist, and, having made his calculations, he devised instrumental means of the most exquisite delicacy with a view of verifying his results. In this way he swept the field of diffraction practically clear of difficulty, solving its problems where even Young had failed.

Truly these were minds possessing gifts not purchasable with money, and round about the central labours of both of them, minor achievements of genius are to be found, which would be a fortune to less opulent men. I hardly know a finer example of Young's penetration than his account of the spurious or supernumary bows, observed within the true primary rainbow. These interior bows are produced by interference. It is not difficult, by artificial means, to form these bows in great number and beauty. This is a subject on which, as you are aware, I worked a couple of years ago myself. And often, when looking at these bows, the words of Young seemed to me like the words of prophesy. The bows were the physical transcript of what Young stated must occur : a transcript, moreover, which, when compared with his words, was far more complete and impressive than any ever exhibited by the rainbow in nature. Many of you are acquainted with the beautiful rings of colour observed when a point of light is looked at through the seeds of lycopodium shaken over a piece of glass, or shaken in the air so as to form a cloud whose particles are all of the same size. The iridescence of clouds that I have once or twice seen in great splendour in the Isle of Wight, but more frequently in the Alps, is due to this equality in the size of the cloud-particles. Now the smaller the particles, the wider are the coloured rings, and Young devised an instrument called the *Eriometer*, which enabled him, from the measurement of the rings, to infer the size of the particles. Again, Ritter had discovered the ultra-violet rays of the spectrum, while Wollaston had noticed the darkening effect produced by these rays when permitted to fall on paper or leather which had been dipped in a solution of muriate of silver. Employing these invisible rays to produce invisible Newton's rings, Young projected an image of the rings upon the chemically prepared paper. He thus obtained a distinct photographic image of the rings. This was one of the earliest experiments wherein a true photographic picture was successfully obtained. Young had little notion at the time of the vast expansions which the art of photography was subsequently to undergo.

But Young was not permitted to pursue his great researches in peace. The *Edinburgh Review* had at that time among its chief contributors a young man of vast energy of brain and vast power of sarcasm, without the commensurate sense of responsibility which might have checked and guided his powers. His intellect was not for a moment to be measured with that of Young ; but as a writer appealing to a large class of the public, he was, at that time, an athlete without a rival. He afterwards became Lord Chancellor of England. Young, it may be admitted, had given him some annoyance, but his retaliation, if such it were, was out of all proportion to Young's offence. Besides, whatever his personal feelings were, it was not Young that he assailed so much as those sublime natural truths of which Young at the time was the foremost exponent. Through the undulatory theory he attacked Young without scruple or remorse. He sneered at his position in the Royal Institution, and tried hard to have his papers excluded from the *Philosophical Transactions*. "Has the Royal Society," he says, "degraded its publications into bulletins of new and fashionable theories for the ladies of the Royal Institution? Let the Professor continue to amuse his audience with an endless variety of such harmless trifles, but in the name of science let them not find admittance into that venerable repository which contains the works of Newton and Boyle, Cavendish and Maskelyne, and Herschel." The profound, complicated, and novel researches on which Young was then engaged, rendered an occasional change of view necesssary. How does the reviewer interpret this praiseworthy loyalty to truth? "It is difficult," he says, "to deal with an author filled with a medium of so fickle and vibratory a nature. Were we to take the trouble of refuting him he might tell us, '*my opinion is changed, and I have abandoned that hypothesis. But here is another for you.*' We demand if the world of science which Newton once illuminated is to be as changeable in its modes as the world of fashion, which is directed by the nod of a silly woman or a pampered fop? . . . . We have a right to demand that the hypothesis shall be so consistent with itself as not to require perpetual mending and patching ; that the child we stoop to play with shall be tolerably healthy, and not of the puny and sickly nature of Dr. Young's productions, which have scarcely *stamina* to subsist until the fruitful parent has furnished us with a new litter, to make way for which he knocks on the head, or more barbarously exposes, the first." He taunts Young with claiming the inheritance of Newton's queries, "vainly imagining that he fulfils this destination by ringing changes on these hypotheses, arguing from them, as if they were experiments or demonstrations, twisting them into a partial coincidence with the clumsy imaginations of his own brain, and pompously parading what Newton left as hints, in a series of propositions, with all the affectation of system."

To Brougham's coarse invective Young replied in a masterly and exhaustive letter. A single copy, and one only, was sold by its publisher. There were at that time in the ranks of science no minds competent to understand controversy. The poison worked without an antidote, and for thirteen years Young and his researches on light had no place in public thought. His discoveries remained absolutely unnoticed until their re-discovery by Fresnel lifted the pall which for so many years had been thrown over this splendid genius.

SCHIRM'S NEW FLASH-LIGHT GALLERY.

BY DR. H. W. VOGEL.

What is the latest novelty in German photography? Answer: The lightning gallery of Professor Schirm in Berlin. The event hinted at by us repeatedly of the establishment of a Blitz gallery dispensing entirely with daylight has at last become a fact, and immense progress in photography has been made thereby, which cannot be estimated highly enough, particularly during the present dark days of winter and the holiday season. The Instantaneous Blitz Gallery has been open since December 1st, under the modest title of "Gallery for Artistic Portraits," Potsdam Str. 20. This Blitz light is employed not only for taking negatives, but also for the production of prints. This is a still greater progress, the negatives being of not much advantage if the cloudy winter days make printing an impossibility.

Our advice to apply the Blitz light, if not rejected, at least met with indifferent consideration, and thousands of reasons were brought against it. We have here an artist, one of the best in his profession, and at the same time a clever amateur of photography, and he accomplishes what professionals would not risk to touch, and in such a masterly manner, that every one who has seen his establishment must be at once convinced.

It was no easy matter for Mr. C. C. Schirm to train his operators for this entirely new mode of photography. He has succeeded because he is not easily disconcerted.

Schirm's gallery is one of the usual elegant dwellings on the first floor, with a small hall and ante-chamber serving

as a reception room, two rooms which are arranged as Blitz galleries, and a large passage-room with one window, into which daylight penetrates only from one corner, and which bears the name of "Berlin room," as an authorised Berlin peculiarity.

This ordinarily partly-dark Berlin room forms the large Blitz gallery for groups. Each of these rooms has, so to speak, a firmament of Blitz lamps.

Schirm's lightning apparatus is known. He works, as Piffard has done before him, by blowing magnesium powder through the flame with an apparatus; but while Piffard applies large quantities—more than 1 gram—he proves that a minimum quantity, 0·03 gram (½ grain) is sufficient for one sitting, and that more is rather injurious than useful. This apparatus is excellent for single pictures, but not sufficient for larger views in grand style. Here it is oftentimes necessary to apply 7, 8, and even 15 to 20 lamps, and to ignite these simultaneously, the latter being of great importance. It is also important not to let the lamps be too near to the subject.

In Schirm's gallery they move therefore on rails, about four meters from the floor and near to the ceiling. Each lamp consists of a Bunsen flame, through which the magnesium is blown, and an illuminating flame, which serves for studying the light effect of the lamp. Some of the lamps are ignited in front of the subject, others from the side. The arrangement is such that the ceiling contains a system of rails, which might remind one of the game called "Mill." An exterior square of rails is placed round the four walls, and in the small room an additional inner square of about half the size. In the Berlin room, intended for groups, is a third and still smaller one. Upon these rails the lamps can be moved at will. Each lamp carries gas tubing and a tube for blowing, which are connected with the main gas pipe and also with the bellows.

This rather complicated system of tubing swinging from the ceiling leaves a peculiar, still not disturbing, impression at first sight. In the small room I counted fourteen on the exterior square, eight on the inner one. In the large room there were sixteen lamps outside. Each lamp (illuminating burner as well as Bunsen burner) had a cock with a long lever, which from the floor could be opened and closed with a pole-hook. Above each lamp burns continually a small igniting flame, from which the gas will ignite by opening the cock. The Bunsen burner is in connection with a small magnesium powder reservoir, which, on being closed, after ignition of the powder, will drop a new, small quantity of 1½ centigram of magnesium into the blow-pipe for the next view. A larger quantity of magnesium has not been found effective: if more light is required, more lamps should be used.

At a single sitting we saw nine lamps in activity—four from the side, four in front, and one from the other side almost behind the sitter. Most of the negatives are taken on old, extra blue sensitive plates, the magnesium light containing mostly blue rays. A mechanical electrical arrangement is used for the exposure, which, after the subject has been posed, opens first the flap on the objective, and immediately afterwards sets the blowing apparatus to work, which blows the magnesium powder through the flame, after which it closes again the objective flap, all by electrical movement.

The whole system is so neat and well executed that we cannot sufficiently praise the inventor.

The blow-light itself is not instantaneous, and lasts about one-half second, but the time of the objective shutter is only about one-tenth second, so that the exposure can be considered as instantaneous. It is remarkable that all brands of dry plates have not proved equally good and effective. The sensitive Beernaert plates cannot be used at all. Voigtlander's Euryscope, Series III, second diaphragm, was used as an objective. It remains a fact that a well-exposed negative was obtained. It may have had a pretty strong top light character, according to the judgment of some; but that pictures can be obtained of faultless illumination is proved by Delden's magnesium Blitz pictures, *Photographische Mittheilungen*, 1889, May 2. It is also evident that in such a room one is enabled to utilize every place, under the window, the piano, the stove, near the door or in any corner, for posing the subject, so that more change in the artistic arrangement is possible. The decoration of the whole room should of course be selected and gradnated photographically, and if this has not been done, it is an error which can easily be remedied.

The Blitz printing process is also interesting. This is executed on bromide paper. To prove that paper copies could be obtained at once, Professor Schirm pressed a piece of paper upon a gelatine negative, quite wet, and washed only for ten minutes, placed this upon a table arranged with a measure (rule) opposite a vertical ground glass at a distance of about 120 cm., and ignited behind it, with his military Blitz lamp—which is commonly used for signalling,—a flash of 1½ centigrams of magnesium powder. This was sufficient to obtain, with eikonogen development, a well-exposed print. It is peculiar how the character of the pictures and their tone changed by placing the negative nearer to the light or further off. Those near-by appeared browner and softer.

Ordinarily the prints are made after the negative is thoroughly dry and has been retouched, and a dozen cartes-de-visite can easily be printed with one flash. The tone of the prints I saw was perhaps a little too cold, but warmer tones can easily be obtained by a change in the lighting and development. Dr. Just's book, "Guide for Positive Developing Processes," gives the desired information. By the powerful action of the Blitz light it is shown that two flashes were sufficient to obtain a very intense positive from a drawing on bromide paper. Prints from these flash negatives can, of course, also be made by any of the other processes, so that in this respect no objection can be made to them.

Mr. Van Delden is fitting up another Blitz gallery in Breslau, but Mr. Schirm deserves the merit of having been the first to introduce this new kind of Blitz gallery. This is certainly a new step forward in photography—emancipation from daylight and emancipation from time, and I am convinced that it will have considerable influence on the progress of our beautiful art.—*Anthony's Bulletin.*

"THEY have been having *tableaux vivants* at Osborne," says a daily contemporary, "and the Royal photographer of the Isle of Wight has been busy. A photographer of Ryde has been nearly a dozen times to the Court, and the other day Princess Beatrice, on her way back from visiting the scene of the Needles wreck, called at his establishment and left her likeness in the costume of Mary Queen of Scots."

FOR a lantern slide, a *special negative* should be taken, or, in other words, if a lantern slide of a view or object is desired, it should be taken and manipulated all through with reference thereto. That it should be sharp, clear, and brilliant, is a *sine qua non*. But it is not enough that this alone should be obtained, for there is an enemy lurking in your every surrounding, against which you must be on constant guard, and that is DUST.—*Mosaics.*

SOME FURTHER APPLICATION OF THE RAMSDEN EYEPIECE TO PHOTOGRAPHY.

BY F. H. VARLEY, M.I.E.E., F.R.A.S.

THERE is nothing like having a hobby, and riding that hobby; it is a cheerful exercise, and does no one except the rider any harm, unless the hobby be ridden down to the death.

The Ramsden eyepiece as a hobby I do not think has been made to run the heedless course. We find it employed in the double capacity of a microscope and an eyepiece in surveying levels, theodolites, transit instruments, and micrometers for telescopes; also as a microscope for reading off the fine divisions of the vernier and the divided circle. The eyepiece micrometer of telescopes, the eyepiece of the surveying level, the theodolite, and the transit instrument are all positive eyepieces—that is to say, that the image is formed in front of the field lens. The reason for using the positive eyepiece is obvious. These instruments require the cross hairs, or spider lines, to be in distinct focus whilst viewing the correctly focussed image produced by the object glass; or, in other words, the image formed by the object glass falls exactly upon the same plane as that occupied by the spider lines. Thus, if we make the adjustment of the Ramsden eyepiece to be in correct focus with these spider lines, and then adjust the object glass to correctly focus the image, both will be in critical or precise focus. Now if we make the adjustment of the Ramsden eyepiece as described in my communication of the 31st ult., to be coincident with the image focussed on the ground-glass screen, but employing a plane of clear glass of equal thickness crossed at right angles with parallel rulings inserted in the camera at the same position as the ground screen, a transparent critical focussing plane is secured. The use of this transparent plane shows at once how very much detail is really lost by dispersion from the ground surface. The image formed by the camera lens, instead of appearing with a woolly indistinctness, comes out much sharper, brighter, and clearer. This facilitates focussing, as it dismisses all fear and doubt from the mind as to whether the best possible focus has been obtained. When using the focussing apparatus, already described in my former communication, at an angle to the ruled glass plane, there is a small amount of error due to refraction of the incident ray falling at an angle to the glass surfaces. Practically, however, this may be disregarded, so long as the rulings on the glass are in distinct focus at the centre of the field of the eyepiece. I should therefore recommend, first, focussing with the ground-glass screen in the usual way. For the general effect apply the focussing apparatus to that part of the picture which it is desired to be critically focussed, and obtain the correct adjustment; remove the ground screen, and insert the clear glass with rulings, and verify the focussing.

Those who have not tried the difference of effect produced by the interference and diffusion created by the numerous prismatic points of the ground glass surface, will be astonished at the clearness of the detail and brilliancy of the image obtained by means of the Ramsden eyepiece.

There is one more use to which this eyepiece can be applied with advantage, and that is as an illuminator for the microscope in place of the achromatic condenser, especially as it can be employed for micro-photography, and is less costly.

The eyepiece I have employed for this purpose is constructed with a field lens, $\frac{3}{4}$-inch focus, eye-lens $\frac{3}{8}$-inch, both plano-convex, placed about $\frac{1}{2}$ths of an inch apart, with their convex side turned toward each other. In front of the field lens I place a diaphragm with an aperture of $\frac{3}{32}$-inch diameter. The distance of this diaphragm from the field lens is so adjusted that if the eyepiece is held at a distance of two or three inches from the eye, upon looking through, the margin of the hole is seen sharply defined; it is ready then to be placed in the secondary stage of the microscope. I prefer to turn the microscope so that the body is in a horizontal position, and place it in a direct line with the source of light, then focus the object, after which I adjust, by means of the secondary stage, the illuminator, so that the margin of the diaphragm is distinctly focussed; next I place a condensing lens between the light and the diaphragm, and so adjust the distances of both that the image of the light is focussed upon the diaphragm. The image should be just large enough to uniformly cover the aperture and the fringe of the light caught upon the margin. In this way an uniform and perfect disc of light is obtained, and but little difference between this mode of illumination and that from an achromatic condenser is discernible.

I do not remember having seen the Ramsden eyepiece so applied as a condenser for the microscope except when I adopted it myself as a convenient expedient upon occasions when an achromatic condenser has not been available. By its means I have obtained, with a one-third of an inch objective and a high-power eye-piece, the markings of Navicula, Formosa, and Podura scales perfectly resolved. The reason for employing it as a condenser is identical with that of focussing the image on the ground-glass screen—viz., to obtain a critical image of the flame—or surface of the incandescent lime when the oxyhydrogen light is employed—coincident with the object focussed. I believe it will be found to be of considerable utility when photographing by artificial light. I may here state that when a condensing lens is employed for throwing the image of the light upon the diaphragm, it is very desirable, and for photographing I believe it is absolutely necessary that this condensing lens should be achromatic. The two objectives of an opera glass whose combined foci is about two or three inches, answer this purpose admirably. If they are not available, place the light as near to the diaphragm as possible, but do not employ a monochromatic lens. The Ramsden eyepiece and an achromatic lens for producing the luminous image on the diaphragm give the most perfect combination, as well as greater brilliancy of illumination.

If the microscope has the achromatic illuminator fitted to it, always use it directed to the light. To obtain the critical image, if this image is too small to cover the whole of the field of view, a condensing lens has to be employed; it is very important that this lens be achromatic.

So that, after all, the Ramsden eye-piece is practically as perfect as the more elaborate and costly achromatic illuminators generally employed: I am referring to the use of artificial light. The most perfect, of course, though very seldom attainable in this country, is to direct the achromatic illuminator to a well-lighted cloud. In this case also the Ramsden eyepiece can be applied, if the image of the cloud is focussed, or the diaphragm by means of an achromatic lens.

A PARTNERSHIP has been arranged, we are informed, between Mr. M. Auty, of Tynemouth, and Mr. Richard E. Ruddock, late of Messrs. W. and D. Downey's Studio, London. The style of the firm will be Auty and Ruddock.

Notes.

An astronomical photographic curiosity was exhibited at the last meeting of the Royal Society in the way of a photograph, by Mr. Isaac Roberts, of the Orion nebulæ, on which two exposures of two hours and two and a half hours respectively, at an interval of five days, had been juxtaposed. While the pairs of discs for most stars were sensibly equal, the pairs for at least ten faint stars showed great differences in intensity. Mr. Roberts considers that this indicates the variability of these stars in a few days. But, as the *Observatory* points out, confirmation of this view is eminently desirable. A similar pair of exposures should show the same ten stars as variable, if we are to exclude the possibility of accidental appearances. Indeed, this principle of duplicate exposures might be carried much further. Despite delicacy of manipulation in the preparation and development of negatives, films may behave with eccentricity, and minute imperfections may be taken for stars, and *vice versa*. This system of duplication would, however, entail enormous expense, and at the present moment is impossible.

Pinhole negatives are attracting much attention just now, and the study is gradually taking form in regard to the principles of working. Captain R. Colson has given to the *French Photographic Society* some curious calculations *apropos* of the relationship which exists between the size and clearness of the picture and the dimensions of the pinhole that takes the place of the lens, and those who are curious on the subject will find his figures in the Transactions of the Society. With regard to the time of exposure, Captain Colson is of opinion that it is impossible to give exact figures, as the circumstances differ. His own experience on a particular brand of plates furnishes, however, the following data:—For distant objects, four seconds; for objects in sunlight, at a distance of ten to a hundred metres, fifteen seconds, and for portraits well lighted, twenty seconds.

A graceful allusion to the late Father Perry is made in the *Observatory* by Mr. H. Turner. In regard to the special photographic work of the expedition, Mr. Turner says the sudden illness of the chief member of the expedition made it advisable not to attempt development of the photographs so obtained. These were brought by Mr. Rooney to England, and have recently been developed. Those actually taken by Father Perry show the very great care he must have taken to focus his instrument, and the results generally are successful.

The exhibition to be held in March, promoted by the Royal Meteorological Society, promises to be exceedingly interesting from a photographic point of view. Meteorological science, we understand, will be illustrated by the largest and most complete collection of instruments and photographs which can be got together. So many uses have been found of late years for photography in connection with meteorology, from sunshine recorders to M. Janssen's photographs of mists, and the recent pictures of lightning, that the exhibition promises to be altogether unique.

An appreciative biographical sketch of the President of the Photographic Society appears in the *Popular Science Monthly* (New York), accompanied by a very excellent portrait. Mr. Glaisher's labours in connection with astronomical and meteorological work are well known, and of these labours the writer of the sketch gives a very complete epitome. It is sufficient to say that Mr. Glaisher is the author of more than one hundred books and papers relating to astronomy, meteorology, and the theory of numbers, to indicate his untiring industry. Although entering upon his eighty-first year, he retains all his old vigour and energy, as was evident at the dinner of the Society on Monday.

The Japanese are enthusiastic over photography. The Minister of public instruction in Japan has announced that at the next term, photography will be taught in most superior schools, notably at the Archeological Institute, at the Forester's Institute, and in the Military Academies. *La Nature* enquires when it will be that the same course of instruction is organised in the special large schools of France, and in those of art and drawing, and the same question might be asked in England were it not that amateurs are so numerous and so diligent as to almost render unnecessary any stimulus from the legislature.

The ter-centenary of the invention of the compound microscope, which is to be celebrated this year at Antwerp, reminds us of the respectable age to which this instrument has attained. Of late years, microscopical appliances have been vastly improved, and the application of photography has given to microscopical study fresh interest and fresh power. Photographic attachments will make a large show at the exhibition proposed to be held, and among the subjects to be discussed at the inevitable conference will be photo-micrography.

The annual report of the Harvard College Astronomical Observatory just issued gives much interesting information as to the valuable work performed under the direction of Professor Pickering. The handsome gift of 50,000 dollars by Miss Bruce for the construction of a photographic telescope of novel form is specially alluded to, and it is foreshadowed that, when completed, the instrument will effect a total change in the work of the observatory. For instance, in 1885 it was proposed to photograph the entire sky with the eight-inch telescope, enlarging the plates three times, but the generous aid of Miss Bruce will permit this result to be attained in the original photographs without enlargement—an enormous gain both in time and economy. A contract has been made with Messrs. Alvan Clark and Sons for a telescope having an aperture of 24 inches, and a focal length of 11 feet.

THE LATE DR. E. HORNIG.

Hon. President of the Photographic Society of Vienna.

From a report of the speech of Professor Fritz Luckhardt, delivered at the January meeting of the Photographic Society of Vienna, in the *Photographische Correspondenz*, we abstract the following account of the life and labours of the late Dr. Emil Hornig.

We have lost, says Prof. Luckhardt, in Dr. Hornig one of our best friends—one whose heart was full of warmth towards the Association and its members. Hornig was one of those men who, with the appearance of a somewhat rough exterior, possessed a kernel of noble quality. Those who knew him well, recognised him as one of the best of men. He was born in the year 1828, the son of the Royal Counsellor Josef Hornig, who, at that time, was professor of Roman law at the University of Vienna. He was educated from his fourteenth year at the Academic Gymnasium, and after studying philosophy and, for some time, jurisprudence, he applied himself with the greatest diligence to the study of chemistry and physics at the Polytechnic Institute. He was one of the most industrious students at the laboratory of the Institute, where he interested himself in all matters concerned with applied chemistry, and diligently occupied himself with analysis—both qualitative and quantitative.

In the year 1851 he was appointed provisionally instructor in the high school, and some years afterwards prepared himself for obtaining the grade of professor. As a teacher he understood, as few do, how to combine necessary firmness with kindly forbearance. He was at the same time the instructor and friend of his numerous students, as is evidenced by many examples communicated to me by those who, as pupils, drew their inspiration from him—the councillor Dr. W. Exner amongst others. Shortly after attaining his professorship, he was appointed corresponding member of the Imperial Geological Institute, and the College of Doctors of the Philosophical Faculty elected him as Dean. He acted for some time as counsellor of the administration of the Lower Austria Industrial Guilds, and edited its weekly journal. Dr. Hornig instructed himself in all the domains entered upon in connection with this work, and was on that account a many-sided man. When his excellency Baron Schwarz-Senborn was intrusted with the guidance of the Universal Exhibition of 1873, Hornig was one of the first whom he called to his side to assist in the undertaking. For his successful activity in this matter he received the title of royal councillor, and was decorated with the Swedish order of the Northern Star.

The experiences thereby gained caused him to be selected in connection with the Philadelphia Exhibition of 1876, after which he was decorated with the order of Francis Joseph, and in 1878 he was appointed as Royal and Imperial Commissioner for the Paris Exhibition. I had the opportunity in Paris to learn the pre-eminently superior, though little known side of our friend's character. I have seen how he struggled on behalf of those who felt that they had been overlooked or not fairly appreciated, and especially how he always stood up for his own countrymen. France recognised his merits by conferring on him the title of the Legion of Honour, whilst his Majesty the Emperor distinguished him with the Order of the Iron Crown, a distinction which awakened much jealousy and envy in some quarters. He now applied his whole energies to the advancement of our Association, the Photographic Union, to which he had belonged from its foundation. He was now chosen for the chief office in our Society, and under his thoughtful care discord vanished and the Association grew and prospered. He took over the *Correspondenz* from the then editor, Herr L. Schranck, and advanced the undertaking by attracting notable writers in technical matters and at considerable pecuniary sacrifice. He devoted his time from early till late to the work of the Association, and, as far as possible, concentrated in his own person the labours connected with it. A new era was thereby inaugurated in the life of the Society.

In his own family he was the best of sons; it was touching to see the tenderness of his attachment to his mother. The worthy matron died the preceding year at the age of ninety years. It is a happy circumstance that Hornig, in his illness, knew nothing of the pain of this loss; he could not have endured it. Four years since Hornig suffered from a paralytic seizure from which he never recovered. His faculties became more and more dimmed, until at last his tongue could no longer move, and he was unable to pronounce a word. I shall never forget how, when I last visited him a few months since, his eyes seemed to lighten, and he appeared to recognise me, and to endeavour to say something, but in vain.

Hornig was an acute observer, such as is seldom met with; on this account he was often applied to as an expert. He was president of the Association of Gas Industries; especially he was a many-sided man, and it was never in vain to knock at his door when advice or aid was wanted. It was he whom the council of the Voightländer Institute employed to give the impulse to scientific enquiry into the action of chromium salts upon gelatine, albumen, and such like substances. The selection fell upon a young man whose talents Hornig had recognised, and who he expected would be able to trace out the kernel of the question. The prize was won by Dr. Eder.

It was Hornig's constant idea to create an institute for photographic research, and he worked at it incessantly until that object was reached; the idea was even enlarged, and a school erected for instruction in combination with the institute for research.

Hornig's literary ability was shown amongst other things in technical chemical works, of which may be noted a treatise on glycerine, one on cheesemaking, and one on mineral analysis. He also contributed many treatises in the technical journals, and was on that account made corresponding member of the Austrian Museum of Art and Industry, and honorary member of many societies.

From the year 1871, with but little interruption until 1885, Dr. Hornig, without any payment, edited a photographic annual which he presented to the members of the society. This included a note-book for photographers and amateurs, with exposure tables and negative register.

In 1880, Gerot, in Vienna, published Hornig's "Handbook of Technical Chemistry for High Schools and Technical Institutes of Instruction." In 1882 Hornig published under the title "Photographica" sheets illustrating photographic processes in four series.

Dr. E. Hornig was elected President of the Association in 1871, and presided for the last time in February, 1885. In the following May he was appointed Honorary President, and at the same time was awarded the gold medal of the Society.

In the beginning of the year 1870 he commenced a course of lectures upon photographic chemistry at the Polytechnic Institute, which, however, was abandoned in

consequence of the unequal preparatory schooling of the hearers.

It is in our loving remembrance that our journal—the *Photographische Correspondenz*, was presented by him to the Society. As Baron Burg has said, "The loveliest attribute of mankind is gratitude." Our grateful remembrances are given to the memory of Dr. Emil Hornig.

PHOTOGRAPHIC WASTE PRODUCTS.

MR. JOHN YOUNG, of 84, Market Street, Chicago, has issued the following circular to photographers:—

1st. *Paper Clippings, all Untoned or Over-Exposed Prints, Blotters, Filters, &c.*, should be introduced by degrees into an ordinary stove and burned to ashes in the most thorough manner. It is important that the ashes be not withdrawn from the stove until the whole of the carbonaceous portion of the paper is entirely consumed. The paper should be kept free from admixture with tin-type clippings, glass, nails, and other extraneous matter, which is a positive injury to the waste. Before burning see that the draught is completely shut off, otherwise much loss of silver will be occasioned.

2nd. *Print Washings and Old Positive and Negative Baths.*—To save the above waste in the easiest and most economical manner, procure a good sound cask, of dimensions suitable to your needs, loosen the top hoops in order to remove the head, and replace the hoop tightly. Next have a hole bored through the side of the cask about seven or eight inches from the bottom; into this insert a wooden faucet, and the barrel is ready to receive the waste solutions referred to. To precipitate the silver from these, proceed as follows: Make a saturated solution of common salt, and add it to the liquid in the barrel; the precipitate which forms is chloride of silver. An ounce of common sulphuric acid, added occasionally, acts beneficially, keeping the solution in an acid condition. Should the liquid, after standing twenty-four hours, refuse to clear up, a wine-glass full of a saturated solution of common alum or proto-sulphate of iron will bring about the desired result. When the precipitate has subsided, the waste water can be drawn off by the faucet and thrown away.

3rd. *Fixing Solutions from Prints and Dry Plates, and Cyanide Solutions from Tin-Types.*—These should be introduced into a barrel similar in every respect to that referred to in No. 2. Instead of *salt*, however, the savory compound known as *sulphide of potassium* must be dissolved and added so long as it forms a precipitate. The latter is of a very dark colour, and in this case is termed *sulphide of silver*. In these, and indeed all waste solutions, large stoneware crocks may be advantageously substituted for barrels, should the volume of waste not be too large.

4th. *Wet Plate Developer Washings.*—These may be introduced into a large stoneware crock, and allowed to stand untouched for twenty-four hours or so. No re-agent for precipitating the silver need be added, as the proto-sulphate of iron necessarily present accomplishes this in the most thorough manner, more especially if an ounce of common sulphuric acid be added. The latter prevents the formation of a useless deposit of iron along with the silver, and the refining as a natural sequence is rendered less difficult. A few drops of any "light oil" sprinkled on the surface likewise retards oxidation.

5th. *Gelatine Emulsions.*—To recover the bromide and iodide of silver which are present in the above waste, introduce the emulsions into a large stoneware crock to a height of one-third; a quantity of common sulphuric acid, say one or two quarts, must now be added. This in a few hours will result in the degelatinization of the gelatine, the latter losing its setting qualities. A large amount of boiling water must now be added, so as to make the solution as attenuated as possible. The silver will now, by reason of its superior specific gravity, gradually subside, forming a pale yellow deposit at the bottom of the vessel. Allow the crock to stand several days, and then decant off the supernatant liquid, and throw it away. Dry the precipitate spontaneously, or by filtration, through *very fine* bleached muslin, and it will be ready for treatment by the refiner.

6th. *Gold Solutions.*—Old "spent" toning baths sometimes contain a small amount of gold. To recover this proceed as follows:—Pour all these solutions into a stoneware crock; next add an ounce or two of common sulphuric acid, and finally, also, a strong solution of freshly dissolved protosulphate of iron. The precipitate will soon subside, and in time form a brownish-black deposit at the bottom of the vessel. The deposits, also, which invariably form while the toning bath is being neutralized by carbonate of soda or other alkali, should be saved and thrown into the crock.

7th. *Concluding Remarks.*—If absolutely necessary, the wet plate developer waste may be thrown into the barrel containing the print washings, but it is best kept separate.

8th. Should space be limited, the print washings and fixing solutions, &c., may be kept in the same barrel, and sulphide of potassium *only* used to precipitate the silver. We do not recommend this, however, if it can be avoided.

9th. A piece of very fine bleached muslin makes a good filter for all the wastes we have alluded to. An old felt hat or chamois leather skin is also very good, but acts slowly.

10th. In sending wastes, mark each lot with its appropriate designation, and observe that no gold will be sought for in silver residue, unless specially desired. Do not fail to mark on outside of package the name of the firm on whose account the waste is to be refined, and endeavour to allow at least fourteen days to elapse before asking about returns. Very large sacks or boxes of waste may be forwarded by freight; smaller and more valuable parcels by express, and very small lots by parcel post. If sent by freight, invariably forward a bill of lading, or delay will certainly occur.

WATER FOR PHOTOGRAPHIC PURPOSES.—Ordinary tap water is generally to be recommended for washing operations and for preparing solutions. For a stock solution of gold, however, and for nitrate of silver when that is required, distilled water should be employed. In solutions containing oxalates, such as the ferrous oxalate developer, and the solution for developing platinum prints, it is well to avoid the presence of lime salts, as these give a turbidity with oxalates. If distilled water is not at hand in sufficient quantity for these purposes, tap water may be made almost as good by removing the lime from it. This may be done by adding a little potassium oxalate, and allowing the precipitate formed to settle down. The quantity of oxalate to be added will depend upon the quality of the water; and it may be a guide to say that for New River water about thirty grains of potassium oxalate to the gallon would probably be a suitable amount.—CHAPMAN JONES in *Abraham's Photographic Annual.*

A NEW EYE.

BY CAMILLE FLAMMARION.

It cannot be gainsaid that the human eye is an admirable optical instrument. What transparency in this living crystal: what delicious shades of colour in this iris; what depth, and what charm! It is life, it is passion, it is a desire, it is the will, it is light! Close all these eyes: what would remain of creation? And, nevertheless, we have here a new eye—complementing our own and excelling it—still more marvellous. This eye, whose visions I have just admired, measures more than a metre in diameter, and fifteen metres in depth. Its crystalline lens is formed of an immense piece of glass, and its retina of a highly sensitive chemical plate. The eye of a giant, in verity, as the man possessing it should measure in our organic proportions 100 metres in height, and he would not be able to pass under the Eiffel Tower without humbly bending. A gigantic eye, possessing four marked advantages over ours: It sees *quicker*, *farther*, *longer*, and, precious faculty, it fixes, prints, and preserves what it sees.

Quicker: In the millionth of a second it photographs the sun, its spots, its vortices, its flames, its mountains of fire, and gives them to us in the form of an imperishable document. Farther: Directed toward any point of the heavens, in the darkest night it discovers in the abysses of the infinite, stars, worlds, universes, creations which our eye could never see with the aid of the best telescope. Longer: That which we have not been able to see after a few seconds' attention, we shall never see. This eye only has to look long enough: at the end of a half hour it will distinguish what it did not see; at the end of an hour it will see still better, and the longer it remains fixed upon unknown space, the better it will possess it—without fatigue, and always better; and it preserves on the plate, serving as its retina all that it has seen: our eye retains images but a moment.

Let us suppose, for example, that a man is killed at a moment when quietly seated in his arm-chair, and having his eyes open before a brilliantly-lighted window, and that his eyes should be removed and immersed in a solution of alum. These eyes would preserve the image of the window, with its transversal bars and its illuminated openings. But in the normal condition of things, our eyes do not retain images—there would be too many. The giant eye of which we speak retains all that it has seen; we have only to change the retina.

This new eye is the photographic eye. The principal astronomers of the world have just met at the Paris Observatory in order to decide on its immediate application to a new and complete study of the starry heavens. Magnificent specimens of photographs of the moon, the sun, the stars, the nebulæ, and even of the planets, were presented to the congress, and showed what may be expected from the new processes. Some photographs among them show us the lunar mountains and craters, such as they would be seen at a distance of forty leagues.

Yes, this artificial retina sees quicker and better, and by an absolutely different faculty it can penetrate into abysses into which we cannot see, and will never be able to see anything. We have here, perhaps, its most extraordinary feature.

Let us place our eye, for example, to the eye-piece of a telescope whose objective has an opening of thirty centimetres—these are the best instruments now in practical use in observatories. In this telescope of thirty centimetres in diameter and of three and a half metres in length, we discover stars up to the fourteenth magnitude—that is to say, about 44,000,000 of worlds of all kinds. Now, instead of our eye, let us use the photographic retina. Instantly the most brilliant stars will imprint their image on the plate. Five-thousandths of a second suffice for stars of the first magnitude, one-hundredth of a second for stars of the second magnitude, three-hundredths of a second for those of the third, one-tenth of a second for those of the fourth order, two-tenths for those of the fifth order, and five-tenths of a second for stars of the sixth magnitude. Thus, in less than one second, the photographic eye has seen all that we can perceive with the naked eye. But this is yet nothing. The telescopic stars visible in the instrument will also imprint their image on the plate. Those of the seventh magnitude require one and one-third second, those of the eighth magnitude three seconds, those of the ninth magnitude eight seconds, those of the tenth twenty seconds, those of the eleventh magnitude fifty seconds, those of the twelfth require two minutes, those of the thirteenth five minutes, and, finally, those of the fourteenth, thirteen minutes. It follows that, if we have given our plate an exposure of one-quarter of an hour, we will find imprinted on this plate all that portion of the heavens towards which the glass had been directed, and all that that region possesses—all that which with infinite trouble we might have been able to discover, to measure by a series of laborious and very lengthy observations. A sufficient number of instruments pointed so as to embrace the whole of the heavens will fix on an immense chart all that astronomical observations can study, and which could only have been obtained after a lapse of several centuries.

But here is only the commencement of the marvellous. Let us allow the photographic eye to look instead of our own; it will penetrate into the unknown. Stars invisible to us become visible to it. At the end of an exposure of thirty-three minutes, the stars of the fifteenth magnitude will have impressed the chemical retina and formed their image. The same instrument which shows to the human eye stars of the fourteenth magnitude, and which in the entire heavens would register about 44,000,000 of stars, shows to the photographic eye 134,000,000 at the first requisition for obtaining the fifteenth magnitude. It would reach the sixteenth at the second requisition, in an exposure of one hour and twenty minutes, and throw before the astonished gaze of the beholder a luminous dust of *four hundred millions of stars*.

Never before, in all the history of humanity, has man possessed the power of penetrating so profoundly into the depths of the infinite. With the new improvements, photography gives us clearly the image of each star, whatever its distance, and fixes it on a document where it may afterwards be studied at leisure. Who knows, if at some future day, in the photographic views of Venus or of Mars, a new method of analysis will not enable us to discover the inhabitants!—and its power extends as far as the infinite. Here is a star of the fifteenth, sixteenth, seventeenth magnitude, a sun like our own, at such a distance from us that its light requires thousands, perhaps millions, of years to reach us, notwithstanding its prodigious velocity of 300,000 kilometres in a second; and this sun lies at such a depth that its light, so to speak, no longer reaches us. The natural eye of man would never have seen it, the human mind would never have guessed its existence with the instruments of modern optics; and yet this feeble light,

coming from so far, is sufficient to impress a chemical plate, which will indelibly preserve its image. And this star might be of the eighteenth, of the twentieth order, and still smaller, so small that never human eyes, assisted even by telescopes of the highest power, will see it—for there will always be stars beyond our vision; and, nevertheless, with its little ethereal arrow it will reach the chemical plate exposed to await its coming and to receive it. Yes, its light will have travelled for millions of miles. When it started the earth did not exist—the present world with its inhabitants; there was not a thinking being on our planet; the genesis of our world was about being developed; perhaps only in the primordial seas which enveloped the globe before the upheaval of the first continents. The elementary primitive organisms were being formed in the bosom of the waters, slowly preparing the evolution of future ages. This photographic plate sends us back to the past history of the universe.

During the ethereal voyage of this luminous ray, which to-day reaches this plate, the entire history of the world was accomplished, and in this history that of humanity is but a ripple—but a moment. And during this time the history of this distant sun, whose photograph we now see, may also have been accomplished; perhaps it has long been extinguished, perhaps it no longer exists!

This new eye that carries us through the infinite causes us at the same time to ascend the stages of a past eternity.

Eternity! The Infinite! Contemporaneous astronomy plunges us into their depth and overwhelms us. How can we measure them? Flying with the quickness of the lightning, it would require millions of years to reach the regions in which these distant universes shine; but carried thither, we would not really have advanced a single step toward the limits of space—as space is without boundaries, the infinite without measures; and everywhere, in all directions, there are so many worlds, so many consecutive suns, that if we were to give the photographic plate the sufficient exposure, it would be covered with contiguous luminous points, so close as to only show one heaven of dazzling light; as everywhere, to whatever point we may direct the visual ray, there is an infinity of suns back of each other.

And we live on one of these worlds, on one of the most insignificant, at some point of the limitless immensity, receiving the light from one of these innumerable suns, in a limited horizon, a veritable cocoon of the silk-worm, ignorant of all the causes; ephemeral of a moment, imbued with an illusory view of the world, hardly seeing anything insignificant enough to imagine that we know something, even flattering ourselves with a sanctimonious sentiment of pride to be able to dominate nature; proud of an illusion mistaken for reality, we solve all questions. We call ourselves materialists without knowing one word of the essence of matter; spiritualists, without knowing a word of the nature of the spirit; but at the bottom of all thinking beings scepticism resides, because we are incapable of appreciating anything. Our lost little planet is still too vast for our conception, as we have invented local patriotism and the whole organisation of the divers social groups which divide the world between them is founded on the force of arms. Ah! the astronomer would wish that the leaders of the people, the legislators, the politicians, had the faculty to look at a celestial chart and to understand it. This calm contemplation might perhaps be more useful to humanity than all the congresses of sovereigns, and all the speeches of diplomacy. If it were known how small the earth is, perhaps man would cease cutting it to pieces. Peace would reign over the world, social wealth would take the place of the ruinous and shameful military craze, political divisions would be obliterated, and then only would men freely rise to the study of the universe, to the knowledge of nature, and enjoy the pleasures of an intellectual life. But we have not yet reached this point, and the photographic eye will reveal many celestial mysteries before the human eye sees reason and science establish their reign on our revolving ball.—*Paris Figaro.*

A WIFE'S VIEW OF AMATEUR PHOTOGRAPHY.

GENTLEMEN,—A letter from you addressed to my husband has come to hand. You ask him to write you an article for your photographic annual that is to be published next year, and you put in some taffy about his being a well-known amateur, and some stuff about what he writes being of interest, and that sort of thing. My husband is now on a photographic tour, as he calls it, and, of course, I open all his letters. It is not likely that my husband will be back in time to write the article you wish. When he goes off with that confounded camera of his you never know when he will come home. So I am very pleased to give you a woman's view of amateur photography, and if you print it in your annual I think you will not have another article just like it.

My unfortunate husband was stricken with the amateur photographic plague about three years ago. Up to that time I always considered him reasonably sane. I made no objection at the time to his joining the army of photographic cranks, because, you see, I knew nothing of the subject. I have done everything I could since that time, but, although he has quit smoking at my request, he refuses to give up the camera habit. At the time he began this so-called recreation my house, or perhaps I should say our house, was one of the neatest in the neighbourhood. You ought to go through it now. My carpets have been ruined with those abominable chemicals which he uses. I don't pretend to know their names, but I know well the effect they have. Then the bath room is something frightful to behold. He uses that for what he calls his dark-room, and has contrivances for shutting out the light.

I notice that, in one of the books you sent him, Daguerre was the inventor of photography. He may have been the inventor of photography, but I think it was another sulphurous gentleman with the same initial who was the inventor of amateur photography.

My husband was reasonably good tempered until he took up your diabolical art. I one time opened the door of the room in which he was working. It was all dark inside except a fearful red lamp, which threw a ruddy glow on his face, and made him look as if he were going to have an epileptic fit. The moment I opened the door and let some light into the room that man went perfectly crazy. He claimed I had spoiled a dozen of his plates, although I had touched nothing, and I came near suing for a divorce because of his awful remarks. If the evil one was not the inventor of amateur photography then I would like to know who was. Then the pictures he does turn out when he gets them finished are perfectly awful. He has tried at different times to photograph the children, but the poor little dears looked like wooden images in the pictures. I went into the bath-room once with the baby

and put him in the bath tub. There was some water there already, and it looked clear enough, but in it was some horrible solution of silver, that turned most of the baby jet black, and we haven't been able to get out the colour to this day.

Then the cost of the thing is something frightful, although my husband carefully conceals what he spends on it. I came across one of the photographic dealer's bills the other day, and it was enough to make one's hair stand on end. Pyrogallic acid, whatever that is, was fifty cents an ounce.

Just think, if I had to pay that price for sugar! Eight dollars a pound instead of ten cents.

Fifty cents an ounce! And that wasn't the worst of it. Now what do you think chloride of gold costs? For fifteen grains he is charged fifty cents. Now that, as you know well enough, is very near twenty dollars an ounce, and twenty dollars an ounce is over three hundred dollars a pound! I don't know how many pounds of the wretched stuff he uses every week, but if he uses ten pounds of it, and I am sure ten pounds of sugar don't go very far in a house with a large family like ours, you would see that that is 3,000 dols. for that one thing alone, not to mention the dozens of other chemicals he uses, and I am sure I don't know what the price of them is.

I tell you that amateur photography was invented to drive a poor woman crazy who has a husband that is a victim of the villainous practice. No wonder he says he can't afford a new dress for me when I ask him for it. The house is stained with horrible solutions from cellar to garret, and I am always afraid to use any cups or glasses for fear there is some dreadful poison in them. The cat took some milk out of a saucer that had something or other of potassium in it, and it just curled up and died.

I'm always afraid to sweep in any part of the house for fear it will raise a dust that will spoil something that he has tacked up on a board to dry. I wouldn't mind all this so much if he ever took a picture that was worth looking at; but, as I said before, he never does. There, now, print that in your miserable photograph book if you want to. Mrs. John Tripod.

N.B.—If you ever write to my husband again telling him that his articles on photography will be appreciated, I will burn your letter, and you will lose your postage stamp. So just remember that.—Mrs. J. T.—*Detroit Free Press.*

THE NEW PHOTOGRAPHIC DEVELOPERS.

BY PROF. CHARLES F. HIMES.

For bromide paper, according to General Brown, eikonogen is undoubtedly the developer of the future, affording warmer tones than the oxalate, and beautifully clear whites, without acid flushing, with simple rinsing with water before fixing. Whilst the appearance of the picture is slow, especially as a used developer, preferably twenty-four hours old, is preferred, the development is regular and uniform to every detail, without risk of staining; and the same solution can be used for a number of prints. It is said to be unaffected in its action by variation in temperature, and therefore adapted to all climates. It is non-poisonous, does not stain the fingers, will keep over a month mixed, acts so energetically that only half the exposure is required as that with pyrogallol, and development occupies a much shorter time. The solution can be used over and over again without staining until its reducing power is exhausted. It is, on the other hand, especially adapted to development of over-exposures. With all its excellences it is a cheap developer, and will keep indefinitely as a dry powder. Its slight solubility, however, will prevent its use in concentrated stock solutions, as pyrogallol.

The commercial article is accompanied by formula for its use, and the recommendation by some to reduce the strength of these does not seem to be approved by the most successful experimenters with it. The following formula by General Brown, for a normal developer, will serve to indicate the general character of solutions used:—

No. 1.	Sodium sulphite	15 grains
	Eikonogen	7½ ,,
	Water	1 ounce
No. 2.—	Carbonate of potassium	80 grains
	Water	1 ounce

For use, mix three parts of 1, one-half to one part of 2, according to exposure.

Pyrocatechin. — Orthodihydroxybenzol, an isomer of hydroquinone, with the formula $C_6H_4(OH)_2$ is at present a subject of careful investigation as a developing agent for dry plates. The results thus far are quite promising. Its use as a photographic developer was suggested as early as 1859 by Wagner. Eder and Toth announced its developing power in alkaline solution in 1880. Prof. Benoist, of Toulouse, last year published results of considerable experience with it. Dr. Arnold pronounces it fifteen times as energetic as hydroquinone, and enumerates among its chief excellences the excellent tone and good qualities of the negatives produced by it, the absence of fog, loss of sensitiveness to light of the plates after immersion in the developer, so that development may be continued, after immersion, in ordinary gaslight, or even in diffused daylight without injury; great latitude of exposure, as development proceeds slowly, but uniformly; freedom from stain to the hands; simplicity of formulæ for solutions, and possibility, on account of its solubility, of preparing concentrated stock solutions which will keep well if the pyrocatechin is chemically pure, and which can be used by the drop; convenience in carrying the small quantities of ingredients required for development; development without motion; and withal, on account of its high reducing power, the expense, at twenty-five cents per gramme, is not exorbitant, as that quantity will develop 100 to 150 plates 13 by 18 cm. He employs the following stock solutions: *a*, one per cent. solution of pyrocatechin; *b*, twenty per cent. solution of potassium carbonate. Sodium carbonate he does not find to answer as well. For development of a well-exposed plate, 7 by 9 inches, one cc. of *a* and five to ten cc. of *b* are mixed with sixty to eighty cc. of water. Sulphite of soda does not seem necessary or desirable. The mixed developer will not keep, and should be used only once. Carl Srna, employing it with carbonate of soda and sodium sulphite, as in Balagny's formula for hydroquinone, found it more energetic than the latter, whilst others have found it less so. Dr. Eder, in his more recent experiments, was particular to employ it in its purest form, as was Dr. Arnold, and found it a rapid, energetic developer, yielding coffee-brown negatives

of good quality. He employed the following solutions:—

A.—Pyrocatechin	... ...	1 part
Sulphite of soda	... ...	4 parts
Water	... ...	40 ,,
B.—Carbonate of potash	... ...	4 ,,
Water	... ...	40 ,,

mixing for use one volume of *A* with two of *B*. The sulphite of soda is not absolutely necessary, but with it the solution will keep clear much longer.

Paraphenylendiamin—$C_6H_4(HN_2)$ has been found by Dr. Eder to act well as a developer for dry plates, having about the same energy as pyrogallol or hydroquinone. As far as experiments have been conducted, the development with it is regular, and negatives produced are delicate and soft. It was used with potash, without sulphite, which retards the development greatly, but prevents the solution from becoming coloured.—*Franklin Institute Journal.*

THE DINNER OF THE PHOTOGRAPHIC SOCIETY.

LAST Monday night the annual dinner of the Photographic Society took place at the Café Royal, London, under the chairmanship of Mr. JAMES GLAISHER, F.R.S., President. There was a large attendance.

Mr. W. S. BIRD, Treasurer, proposed success, and prosperity, and usefulness to the Photographic Society of Great Britain, coupled with the name of Mr. Glaisher. He spoke of the high influence of its Journal in times past, until affected by the advent of weekly newspapers, and how great improvements had been made in its last two numbers by the Honorary Secretary. The last exhibition of the Society he considered to be, perhaps, the best ever held in this country. Their President was more than fourscore years of age, and gave to his duties in the Society, as to everything else he undertook, his best work.

The PRESIDENT felt honoured by the trust reposed in him; he had tried to be faithful in his work, and to hold the scales of justice evenly. He wished to see the Society placed in a firm permanent position, and hoped that it would be one day known as the Royal Photographic Society; he also expected that before long it would have a good library.

Mr. SEBASTIAN DAVIS stated that there are now about 400 photographic societies in different parts of the world. He spoke highly of Rejlander, and the way in which he had promoted the artistic side of photography, and proposed prosperity to the photographic societies throughout the world, coupled with the name of Mr. George Davison, of the Camera Club.

The PRESIDENT thought that every society in this country should be connected with the Photographic Society; the parent society was proud of its children.

Mr. G. DAVISON said that the photographic societies of the country looked to the Photographic Society to keep photography up to the highest standard from a scientific point of view. It was also desirable that photography should have high standards from a fine-art point of view. He returned thanks on behalf of the photographic societies, and of himself individually.

The PRESIDENT then proposed the toast of the photographic press, coupled with the name of Mr. W. H. Harrison, who had been known to him at the British Association meetings years before his reappearance in photographic circles.

Mr. W. H. HARRISON responded, and in the course of his remarks said that he ventured to suggest that the photographic societies of this country should enter into closer relationship with foreign societies, and not, as was sometimes the case, act as if the latter had no existence.

Dr. CHARTERS WHITE responded to the toast of the ladies, and narrated some mistakes made by girls at Board School examinations. One girl said that some food was flesh-forming, and other food bone-forming; if they ate too much of the latter they would grow too many bones, and would look funny.

Mr. W. S. BIRD spoke of the admirable photographic work done by Mrs. Cameron and other ladies.

Songs, recitations, and music were given by Miss Friese Greene, and Messrs. Wilson, Brain, Braham, Lowe, Protheroe, and Cowan (senr. and junr.).

Mr. Glaisher had to leave somewhat early, after which Mr. Bird and Mr. W. England presided in turn.

Correspondence.

GAS CYLINDERS.

SIR,—A good deal of unnecessary alarm has been caused by the lamentable accident which occurred rather more than a week ago at Glasgow through the bursting of a cylinder. There is no occasion either for alarm or surprise when the facts of the case are known. If we hear of a man who deliberately throws a lighted match into a barrel of gunpowder, we are neither alarmed nor surprised at the results. This is exactly what has occurred at Glasgow; the unfortunate man who lost his life charged hydrogen into a black cylinder—in direct contravention of the Company's rules—and afterwards, forgetting that he had done so, put oxygen into the same vessel; the result was an explosion, which took place at the first slight concussion which the cylinder received. A piece of the cylinder which was picked up four yards from where the accident occurred was quite hot, showing conclusively that ignition had taken place, and there could have been no spontaneous ignition if the two gases had not been present.

Every precaution is taken by the Companies to prevent the possibility of O and H getting mixed; under no circumstances will they fill hydrogen or coal gas into black cylinders, or oxygen into a red one; neither will they put the one gas into a cylinder which they even suspect has ever contained the other.

With a view, however, of making it absolutely impossible for two gases to be put into the same cylinder, it has been decided by this Company, and also by the Scotch and Irish Oxygen Co., and the Manchester Oxygen Co., to fit all hydrogen cylinders with a left-hand thread, so that they cannot be filled at the oxygen pump, and, in the same way, it will be impossible to fill oxygen cylinders at the hydrogen pump. All consumers are earnestly requested to send their hydrogen cylinders either to the Companies, or to the agents through whom they obtain their supplies of gas, to have the alteration made, and the smallest possible charge will be made for taking off the present valves and fitting on new ones. After a certain limit of time, of which notice will be given, no hydrogen or coal gas cylinders not provided with the new thread will be filled.

In some quarters the fear has been expressed that the accident at Glasgow occurred through over-pressure. Any such apprehension may be immediately dismissed from the mind; explosion from such a cause is impossible. The cylinders are tested to double the pressure at which they are ever filled, and it is impossible to exceed the standard filling pressure of one hundred and twenty atmospheres. They are also re-tested periodically. For years past the Government have been using high-pressure cylinders for ballooning purposes similar to those in use at present; they had them in the Egyptian and Boer campaigns, and they have frequently been rolled from the top of a hill to the bottom, bounding from point to point, and in no single instance has an accident occurred, or a cylinder burst.

In conclusion, I would remind you of the fact that since oxygen and hydrogen have been supplied in high-pressure cylinders—now some three or four years—only two accidents have occurred, and these at the Works; whereas when bags were in vogue, accidents, in many cases fatal, frequently took place. Only last week in America, a lecturer on chemistry and ten or twelve of his pupils were seriously injured by the bursting of a retort in which oxygen was being made by the old-fashioned chlorate of potash process.

T. N. HESTER, *Secretary to Brin's Oxygen Co., Ltd.*
Connaught Mansions, Victoria Street, Westminster, Feb. 7th.

PHOTOGRAPHY AND FIRE INSURANCE.

Sir,—It may interest you to know we have just had our insurance premium reduced 10 per cent. by pointing out to our Insurance Company that no collodion or other such inflammables are stored on the premises. Norman May & Co.

12 & 13, *Church Street, Malvern, and at Cheltenham, Feb. 8th.*

PHOTOGRAVURE.

Sir,—Referring to Dr. Gunther on photogravure, page 99 of the Photographic News this week, can you tell me at what part of the preparation of the *second* stone is the asphalt applied? There is no mention of its application to the second stone, but yet it says at the end of the article, clean it off with turps. If you can give me any information on this point I shall feel obliged, as I intend trying the process to the end. I thoroughly understand a great deal of it already, but cannot see where the asphaltum is applied to the second stone. If successful, it must be a very good process. E. Frewing.

26, *Eden Street, Kingston-on-Thames, Feb. 7th.*

Patent Intelligence.

Applications for Letters Patent.

1,854. H. L. Young, St. John's Vicarage, Portsea, "Combination Hand Camera."—February 4th.

1,857. J. V. Elsden, Storrington, Pulborough, Sussex, "Exhibiting Photographic Transparencies in an Ordinary Lamp-Shade."—February 4th.

1,938. F. Kitto, 18, Fulham Place, Paddington, London, "Apparatus for Exhibiting Photographs."—February 5th.

1,950. J. Swift, 81, Tottenham Court Road, London, "Iris Diaphragm."—February 5th.

1,956. E. and C. Ireland, 8, Quality Court, London, "Producing Coloured Photographs."—February 5th.

1,998. G. W. Secretan, 22, Southampton Buildings, London, "Producing Magic Photographs."—February 6th.

2,034. A. G. Rider, 323, High Holborn, London, "Walking-Stick Tripods."—February 7th.

2,039. A. F. Bannister, 67, St. George's Avenue, Holloway, London, "Hand Cameras."—February 7th.

2,100. T. P. Watson and W. Moscrop, 53, Chancery Lane, London, "Cameras."—February 7th.

2,101. G. Bishop, F. Bishop, and J. P. Kirk, trading as Marion and Co., 53, Chancery Lane, London, "Reflectors Used in Photographic Portraiture."—February 7th.

Specifications Published.

18,357.—*December 15th*, 1888. "Changing Camera Slides." Henry Herbert, 119, Hartfield Road, Wimbledon, Electrical and Photographic Instrument Maker.

The object of this invention is to provide means whereby a considerable number of plates, say, for example, a dozen, can be carried, exposed, and changed, in one apparatus, instead of the two plates usually carried in the ordinary dark back.

In carrying this invention into effect, I provide a suitable box or case which may be adapted to slide in the back of the camera, or in a separate frame of its own which may be attachable to the camera in the ordinary way, or may be used separately where required. The sliding box is made of suitable size and shape, and contains the required number of plates, whether exposed or not, and is preferably provided with a closing shutter and a narrow slit or opening at the inner end, through which each plate as it is required for use can pass. This opening may be closed with an automatic shutter, which, upon the removal of the case from its frame or the camera, at once closes the opening and prevents the entrance of light into the case. In the back of the camera or frame I prefer to provide a spring-controlled hinged plate or equivalent device, preferably of wood, which is pressed back into a suitable recess or receptable upon the insertion of the sliding case, and upon the withdrawal of the case springs forward.

In using this apparatus, the sliding case is first charged in the usual manner with the sensitised plates, and is then inserted into the frame or camera, the automatic shutter withdrawing from the aperture in the end of the case as it enters. The case having been pressed home, and it being desired to place the plate in position for exposure, the case is withdrawn, the bottom plate passing through the slit in the casing and remaining in the camera or frame as the case is withdrawn. The spring back is locked by a suitable detent, but when the sliding case is withdrawn sufficiently far from the frame or camera, the detent is automatically released, and the spring back then moves the plate forward to its proper position for exposure, where it is held securely by the sliding case, which is now returned into the frame or camera. After exposure, the sliding shutter is withdrawn, and the plate falls back into the sliding case with the other plates; the shutter is then closed again. To expose the next plate the sliding case is withdrawn as before, leaving the next plate in the frame; this is brought forward as already described, and the sliding case is again returned, and, after exposure, the second plate is replaced in the case by the withdrawal of the sliding shutter as before, and so on until all the plates have been exposed, when the sliding case may be removed and a new one already charged substituted, or the sliding case can be relieved of the exposed plates in the dark room, re-charged with fresh plates, and replaced as before.

In the frame or camera, at the opposite end to that by which the sliding case enters, I prefer to have a spring controlled, rising bottom, carrying two suitable guides so arranged that, when the plate is pushed forward by the hinged back, it must of necessity come into the right position for exposure. When the sliding case is inserted, it pushes back the rising bottom.

1,261.—*Jan. 23rd*, 1889. "Photographic Lenses." Hugh Blackwood, Sidney Cottage, Beckenham, Kent, Gentleman.

In order to take portraits or views by photography in a proper and effective manner, the essential points to be attained are, the option of rapidity, width of angle, combined with flatness of field, clearness of definition, and depth of focus (or field), with a comparatively large stop (or wide orifice).

It has, however, hitherto proved exceedingly difficult to satisfactorily attain all these points in one lens. An improvement has been effected on one point, with a more or less contrary effect upon another point.

Even the lenses of Dallmeyer, Ross, Voigtlander, and other well-known makers, which have been produced with the object of obviating these defects, have not entirely done so, but the improvement is so great that these lenses are much sought after, notwithstanding the great cost of the same; and at this very heavy expense (with added weight when travelling) different lenses have to be used, and have hitherto had to be purchased separately from these makers, for the various subjects to be photographed; thus, for instantaneous and general outdoor work, a comparatively narrow angle lens is used, whilst for indoor work and confined situations a wide angle lens is required, and for indoor portraits a portrait lens.

Now the object of my invention is to entirely overcome the difficulties above mentioned, by simple means, at a small cost.

In carrying out my invention, I employ an extra lens, which I place just in front of the rear lens, or it may be inserted in the stop itself, different sizes and strengths being thus optional.

This extra lens, by preference, consists of a bi-convex and a bi-concave, which may be cemented together, or arranged with a small air space between. I prefer the latter arrangement, as I can thereby substitute for one or both a stronger or weaker glass according to the effect it is desired to produce, as by the addition of stronger bi-convex lenses, the focal length may be shortened down to such an extent that the sensitised plate may almost touch the lens.

The glasses which I employ for my extra lens are ordinary eye glasses that can be purchased for a small sum almost anywhere.

The strength of glass which I find most suitable varies from No. 5 to No. 16 (French Nos.), according to the class of lens to be used; thus, for a whole plate rapid rectilinear, or half-plate Lancaster meniscus lens, Nos. 7 or 8 are most suitable, while, for a portrait lens, the strength may vary from Nos. 5 to 16, according to results required. By the addition of my

extra lens, a narrow angle Ross, or other maker's narrow angle lens is converted into a wide angle; whilst a Dallmeyer, or other maker's wide angle lens, may be converted into a narrower angle of any required degree by substitution of a stronger bi-concave. Also, if objects at a great distance are to be photographed—say from the top of a hill—flatness of field and depth of focus—with a large stop or orifice, enabling instantaneous effects—will be attained. A Voigtlander or other portrait lens becomes, by addition of my lens, applicable for all known purposes, as the good qualities previously sacrificed, to get the greatest possible rapidity, are regained. Similarly, any ordinary lens, with addition of my lens, becomes increasedly efficient for purposes of enlargement.

I also find that, whilst with the lenses of Dallmeyer, Ross, Lancaster, and other well-known makers, my adaptation produces greatly improved results, it with some French and other lenses acts as a detective, in case such glasses are badly paired, or the lenses be of poor marginal definition, though at the same time it practically removes this defect, as it permits of the lens being stopped down to overcome the defect, but with a larger stop than could be otherwise used.

I have found that with many meniscus lenses, by the mere addition of one bi-convex glass of No. 8 strength, I obtain rapidity (shortened focal length) width of angle, clear definition, and flatness of field, but in most cases I prefer to use the compound lens.

Similarly, with an addition of one No. 1 or 2 short-sight eye-glass inserted in the stop, an ordinary ¼-plate portrait lens will cover a ¾ or 7″ by 5″ plate at the same focal length (viz., 6½″) as before with a large (⅝″) stop, yet with flatness of field and depth of focus, or a Dallmeyer 2C. Baby lens will cover from a ¼ to a 12″ by 10″ plate, with a larger orifice than at present, and attaining increased rapidity and brilliant effect.

In all cases a diaphragm will be placed between the extra lens and the rear lens in the combination.

1,334.—*21th January*, 1889. "Lens Diaphragms." JOHN STUART, The Hollies, Clapham Common, Surrey, Optician, and GEORGE HARROP, 30, Russell Road, Holloway, London, Engineer.

This invention relates to the stops or diaphragms known as the "Iris," and has for its objects to enable the diaphragm or stop and its holding and operating rings to be contained entirely within a lens tube or mounting of the usual size, and also to provide means whereby the operator can (without necessitating reference to a scale), with great facility and certainty, adjust the diaphragm or stop definitely to any set size of aperture, without danger of its accidentally becoming altered. To effect this, the ring to which one end of the component members, leaves, or strips are centred is made of a size to fit in the lens tube or mounting, and the ring to which the other ends of the said members, leaves, or strips are centred is provided with slots extending from the inner circumference to near the outer circumference, where the said ring is strengthened by a supplementary ring or annulus, preferably at right angles thereto. A stem attached to this slotted ring, or the supplementary ring, projects through a slot in the tube or mounting for enabling the operator to adjust the aperture.

In a suitable part—for instance, in a ring secured within the casing which contains the diaphragm—notches or recesses are made, with which engages a spring or catch secured to any suitable part—for instance, to the ring which is slotted as aforesaid. The free end of the spring catch that enters the recesses or divisions in the ring allows the ring to be rotated; but as it comes opposite the notches or recesses, the operator is aware that the diaphragm or stop then presents a certain known and definite aperture, in accordance with the recess or notch with which the catch is engaged.

The tube or mounting of the lens may be provided with divisions marked so that the position of the stem corresponding with any given aperture may be ascertained by reference to the scale or projections; recesses or the like may be used instead of the scale, or in addition thereto, so that by running the finger over them, they may be readily counted, and the aperture thus ascertained in a dark place.

The inventors claim:—

1st. In diaphragms or stops of the kind described, the actuating ring having a strengthening rim or ring and radial slots therein, opening from the inner circumference of the ring or thereabouts, with which slots engage pins on the leaves, members, or strips of the diaphragm or stop.

2nd. In diaphragms or stops of the kind described, the combination with an indicator or scale of a spring engaging with a notched ring for indicating the degree of aperture, and retaining the leaves, members, or strips of the diaphragm or stop in their adjusted position.

3rd. The arrangement and combination of parts constituting a lens tube or mounting, provided with a diaphragm or stop of the kind shown in the drawings accompanying the specification.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE annual general meeting of this Society was held on Tuesday evening last, the President, Mr. JAMES GLAISHER, F.R.S., in the chair.

The report of the Council was taken as read, and Mr. J. STILLER proposed its adoption; Mr. SCAMELL seconded this motion.

Mr. A. MACKIE made some strictures upon portions of the report, and was followed by Mr. W. BEDFORD, who, while not altogether approving of Mr. Mackie's remarks, thought there was more that might have been done. The question of affiliation with other societies had not been advanced, neither had that of establishing a photographic museum.

Mr. S. G. B. WOLLASTON considered that the papers that had been presented to the Society were, on the whole, of too scientific and abstruse a character.

Mr. G. DAVISON held the contrary view, and thought that the dignity of the Society was best upheld by papers of an abstruse and scientific character. As to affiliation with other societies, directly they went into details to see how it would work, they got into difficulties. If the affiliated societies made any payment, their members would expect to enjoy as a right all the privileges that belonged to the present members, who each paid his subscription.

After a few other observations, the report of the Council was adopted *nem. con.*

The HON. TREASURER then read his report, in which it was stated that the capital of the Society had been increased by carrying forward a sum of £139. The profits on the exhibition had been £161. The cost of the Society's Journal for the number printed was about 7s. a page, and the last number was a very full one. There had been a considerable alteration in the character of the Journal, and it was a matter for consideration whether steps should be taken to secure a continuance of similar abstracts of the various photographic subjects. Several members spoke in terms of high praise of the recent change in the character of the Journal, and hopes were expressed that it might be continued, or even further extended.

The adoption of the Treasurer's report was proposed by Mr. Montefiore, and seconded by Mr. Mackie, and was carried *nem con.*

The PRESIDENT then handed the progress medal to the son of Capt. Abney, who was unable to be present and receive the award in person.

Mr. WOLLASTON and Mr. MACKIE thought that under the new rules, the Council had not the power to award medals, and a motion to this effect was put to the meeting, without, however, finding more than two supporters, whilst fifteen voted against it.

Mr. WARNERKE proposed a resolution, which was carried by twenty against three, to the effect that the phrase "Management of the Society" occurring in the rules, included everything that assists in the advancement of photography and the branches of art connected therewith.

The election of officers was then declared as follows:—*President*—Mr. James Glaisher, F.R.S., &c.; *Vice-Presidents*—Capt. Abney, C.B., Messrs. T. Sebastian Davis, H. P. Robinson, and John Spiller; *Treasurer*—Mr. W. S. Bird; *Members of Council*—Messrs. G. L. Addenbrooke, W. Bedford, Valentine Blanchard, Lyonel Clark, Francis Cobb, A. Cowan, T. R. Dallmeyer, Major L. Darwin, George Davison, W. E. Debenham, W. England, J. Gale, H. Chapman Jones, Capt. A. M. Mantell, Sir T. Prescott, Sir D. Salomons, J. W. Swan, J. T. Taylor, Leon Warnerke, and H. Trueman Wood.

After the customary votes of thanks, Dr. LINDSAY JOHNSON read a paper, in which he pressed upon the notice of the members of the Society the advantages that would be derived from the formation of a museum, and of an institute for instruction and research. Some months since, he said, there had been announced a sale of some very valuable historical objects of great photographic interest. When he heard of the sale he wrote to the Society to see if they could not see their way to purchasing them for the benefit of the Society. Some friends offered to assist with money, but the scheme fell through, and, if he recollected rightly, many of the things were bought for the museum at Bath. As the Society existed at present, it was liable to be turned out of its place at any time. He proposed several alternative schemes, the chief of which was that the Society should obtain premises of its own, where a permanent museum could be established in connection with an institute for instruction and research in photography. This had been done by the Governments in France and Germany, but it would not do to expect as much from the Government here. He thought, however, that the aid of the Common Council might be asked for with a probability of success if the Photographic Society were provided with a place and a programme calculated to inspire confidence. He thought that a place might be obtained in the vicinity of Shaftesbury Avenue, and that if a design for a building were prepared by a competent architect, a building to cost £20,000 to £30,000, the Court of Common Council might be induced to assist, supposing, that is, that it could be shown to be for the advantage of the metropolis that the scheme, as a whole, should be carried. Other alternatives were to apply for space for a museum at South Kensington, which, however, he considered to be too far off, and to hire a flat in a convenient locality, where part of the programme at least could be carried out.

The consideration of Dr. Lindsay Johnson's paper was deferred till the next ordinary meeting, March 11th.

Mr. Enrico Resta was balloted for and duly elected a member of the Society.

CAMERA CLUB.

ON Thursday, February 6th, a paper contributed by Sir DAVID SALOMONS was read, with Mr. E. R. SHIPTON in the chair. The paper contained formulæ for ascertaining the exact distance of the lantern from screen when a particular amplification with a given lens is desired, and for finding the focal length of lens to employ for a fixed distance and enlargement. An exhibition of lantern slides followed of views in the Netherlands, by Messrs. H. M. Elder, E. G. Spiers, and W. A. Greene. These were succeeded by a set of New Zealand scenes by Mr. Wray Palliser, and the first club loan collection of slides, sixty in number, contributed by various members. Other sets were shown by Messrs. Andreae, Dresser, Harding, Tidey, Payne, and A. Shipton. Nearly 300 slides in all were brought by members for exhibition.

At the commencement of the meeting the Hon. Sec. handed round an instrument sent by Mr. Dresser called the "Lanternscope," an apparatus devised for the effective viewing of lantern slides. The lanternscope exteriorly is a little like the stereoscope, but without the means of securing stereoscopic effect. The transparency is viewed through a magnifying eye-piece, the picture having behind it a piece of ground glass for diffusing the light from the lamp. It strongly resembles the instrument devised by Mr. Bow, C.E.

A photograph of the Eiffel Tower, taken by M. A. Pepper, of Paris, was sent for inspection by Messrs. Hinton and Co.

The paper on Thursday, February 20th, will be one communicated by Mr. W. K. Burton, "On One or Two of the Tenets of the Naturalists." The meeting opens at 8 p.m.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 7th inst., Mr. J. ZAEHNSDORF occupied the chair.

Mr. A. C. Pemberton was elected a member of the Association.

A negative was handed round marked throughout the film in a similar way to one exhibited at a recent meeting; the negative had been varnished.

Mr. A. HADDON believed the defect arose from particles of dust in the varnish, causing the gelatine film to be imperfectly protected. Moisture eventually finding its way through the varnish, caused the gelatine film to swell and so split up the varnish, each particle of dust in this way forming a nucleus of the geometrical markings.

Mr. T. E. FRESHWATER read a letter received from the Scotch and Irish Oxygen Company anent the recent explosion, from which it appears that the bottle, at the time of the accident, was filled with a mixture of oxygen and hydrogen; the cylinder was marked H. A portion of the bottle found proved that it had received a test pressure of 240 atmospheres, dated July 2nd, 1889. The letter further stated that it had been determined in future to adopt entirely different fittings for oxygen and hydrogen bottles, to prevent any mistake in the filling of the cylinder, and make it impossible to put the two gases in one bottle.

Mr. J. S. TEAPE showed a stoppered bottle of eikonogen; the crystals had turned quite black. The bottle had only been opened once. Some eikonogen kept in paper a similar length of time was only slightly discoloured.

Mr. W. E. DEBENHAM had kept a sample in paper for some time. It had scarcely changed colour.

Mr. A. COWAN believed the changing of colour of the eikonogen shown by Mr. Teape was due to its having been put in a damp bottle.

Some crystals were taken out of the bottle and placed in water, when it was found that the black colour was only on their surfaces.

In reference to a question asked at the last meeting for particulars as to the photographic inventions of the late Dr. Joule, mentioned in a letter to the *Daily Standard*, Mr. A. Haddon brought down to the meeting a volume of Dr. Joule's scientific papers, collected by the Physical Society of London, in which no trace could be found of any reference to any photographic discoveries.

Mr. J. B. B. WELLINGTON asked what material was considered the best for a lantern screen, and whether bamboo or pine would be best for the frame.

Mr. T. E. FRESHWATER said bamboo of course was the lightest, but it was difficult to get it quite straight, and it was very unequal in thickness; each ferrule would in consequence have to be marked. These objections did not apply to pine wood, to which he would give preference.

Mr. F. A. BRIDGE said that a medium thick calico was the best material for the screen. It was resolved that at the next lantern meeting in March a slide competition should take place.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE fourth general meeting of the session was held on Feb. 6th at 207, Bath Street, Mr. WILLIAM LANG, Jnr., in the chair.

The following new members were elected:—Messrs. Paul Rottenburg, James Richardson, C. J. Anderson, J. T. Darling. Ex-Provost Clark was elected an honorary member.

In the question-box the following questions were found:—(1) "Can anyone give any information about the explosion at Pohnadie? Is there to be any public or scientific report to be made regarding the same?" (2) "What method of varnishing celluloid films is the best?" (3) "Can anyone mention a formula for toning Alpha lantern plates?"

Regarding the first question, after some discussion, it was

thought that the authorities would be sure to investigate the matter. The second question was, to a large extent, unanswerable. It was understood that the Eastman Company were working to produce a suitable varnish.

Professor E. J. MILLS then gave a communication, "Some Practical Notes," in which reference was made to eikonogen, its discovery, chemical constitution, and its rôle as a developer. Several interesting novelties were shown by Dr. Mills, notably a lens mounted in aluminium.

Mr. H. M. SMITH, representing the Eastman Company, exhibited the new Kodak, celluloid film negatives, new glass tray for developing same, and other apparatus.

Specimens of a new glass etching process (Mallodi's patent) were next passed round, and the proceedings closed with a series of photographs illustrative of the various photographic conventions, forwarded by Mr. A. Pringle, and some micrographs by him were shown by means of the Society's lantern.

SHEFFIELD CAMERA CLUB.

AT the meeting of the Club on January 27th, the following were elected officers:—

President—Mr. G. T. W. Newsholme, F.C.S.

Vice-Presidents—Messrs. J. H. Merton, M.D., and J. H. Rawson.

Treasurer—Mr. B. W. Winder, F.C.S., F.R.M.S.

Hon. Secretary—Mr. G. E. Maleham.

Council—Messrs. Wm. Gillig, junr., W. Genkinson, Prof. Arnold, H. Morrell, J. A. Manton, F.R.C.P., M.R.C.S., T. S. Yeomans.

The inaugural meeting of the new session takes place on Feb. 26th.

PHOTOGRAPHIC CLUB.—The subject for discussion on Feb. 19 will be "Lantern Illuminants, including the New Benzoline Limelight."

EAST DULWICH AND PECKHAM PHOTOGRAPHIC SOCIETY.—A lantern entertainment was given by this Society at the Collyer Hall, Peckham, on the 17th inst., when a large number of slides, the work of various members, was shown.

A NEW CHEMICAL SOCIETY, it is said by the *Monthly Magazine*, is likely to be formed before long on the other side of the Atlantic. It is to be called the American Chemical Society, and is to have local sections at Boston, New York, Philadelphia, Washington, Baltimore, and other towns. The new society will, it is anticipated, be an imitation of the English Society of Chemical Industry—that is, a national organisation with local sections.

FLUID MEASURE.—The *Monthly Magazine* describes and illustrates what it terms the "Excelsior" fluid measure, which consists of a well-made tin can or pot of the ordinary shape, with spout and handle, the capacity of which is exactly one imperial quart. Up the side of this vessel are fitted in four glass discs—looking something like the port-holes of a toy merchantman or frigate—duly protected from a chance blow by cross-bars of metal. In this way the level of the interior liquid can be seen, and the quantity graduated into pints, half-pints, and so on.

RECEIVED.—"Abraham's Photographic Annual," though in the main a catalogue of photographic goods, includes some sixty pages of original articles contributed by Messrs. Lyonel Clark, George Davison, A. R. Dresser, E. A. Golledge, W. Jerome Harrison, Chapman Jones, Major J. W. Nott, Andrew Pringle, E. J. Wall, W. Willis, and others; it contains also formulæ, statements of processes, and other useful items well worth the outlay of the few pence charged for this combination of guide-book and trade list.——From Mr. A. R. Wormald, a specimen box of assorted coloured lantern slide masks, which are made in any desired colour, and in gold and silver paper. They are supplied in various shapes assorted, five shapes in each box. With the foregoing is also forwarded a sample sheet of twenty-four colours.

X.—The list of awards at the Royton Exhibition was not received by us.

Answers to Correspondents.

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

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

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

HISTORICUS.—Early history of photography. Consult the Rev. T. F. Hardwich's "Manual of Photographic Chemistry," or pages 18 to 20 of Chapman Jones's "Science and Practice of Photography;" or, lastly, look up the dates for yourself in the early copies of the NEWS, and the first few volumes of the *Photographic Journal*.

NATURE PRINTING does not come within the province of photography. Henry Bradbury's lecture on the subject was delivered at the Royal Institution in May, 1855. The results were certainly very beautiful, but they have been to some extent superseded by photo-mechanical methods, and we do not hear of the process being in actual use at the present time.

E. P.—The print and sensitized paper both show markings, such as would be caused by fine particles of pyrogallic acid or other reducing agent becoming accidentally dusted over the paper either before or during the silver treatment. See page 84 of the YEAR-BOOK. Another batch, you say, does not show this defect when sensitized on the same (filtered) baths and blotted off on the same pads. It would seem, therefore, to be due to some such impurity in this particular delivery of albumenized paper. Get some witness to overlook your work and certify to these particular defects, if your own affirmation is distrusted.

COLOUR (Exeter).—"The Art of Photographic Painting," by A. H. Bool—a little shilling manual to be had of our publishers—gives all the information required to make a start.

H. C. S.—When ordering the rapid plates of Messrs. Marion and Co., be sure to advise them of your special requirement of extreme rapidity. If these should not succeed, try Messrs. Wratten and Wainwright's instantaneous plates.

PHOTARGUS.—Removal of brown silver spots from gelatine negatives. Immersion in excessively weak cyanide of potassium, after removal of the varnish, will sometimes answer, but it is apt to pull down the intensity of the negative. Remember to wash well afterwards. Valuable negatives are often printed with a film of mica between, but the new Eastman celluloid ought to be tried, as it is cheaper. Goldbeaters' skin would not be sufficiently transparent. It is a well-known fact that gelatine negatives are more liable to stains in the printing than were the old collodion plates when treated with the same varnish. In the latter case, the shellac gets through the film down to the glass, but not so with the gelatine, which stands, moreover, in higher relief, and is especially sensitive to the most minute traces of silver. Some advise a preliminary coating of plain collodion before varnishing.

E. F.—Partly answered by post; the other enquiry is proceeding, and your letter inserted.

IGNORAMUS (Dublin).—Formula for collodio-chloride is given at page 203 of the YEAR-BOOK. Chloride of strontium, being more soluble in spirit, is sometimes preferred to chloride of calcium, and may be used in the same proportion.

S. V. W.—Silver washings.—In cold weather the precipitated chloride does not settle down so quickly. An acid reaction favours its separation, so you should use hydrochloric acid instead of salt at this season, and take care to stir well. Your remark about short returns from silver residues may admit of another explanation, and be accounted for by the fact that less silver nitrate is commonly employed in the ready sensitized papers.

F.R.A.S.—An excellent portrait of the late Father S. J. Perry, F.R.S., appeared in the *Illustrated London News* of 18th ult. It is a Meisenbach block from a photograph by Messrs. Maull and Fox, 187, Piccadilly, from whom an original copy may very probably be obtained.

SPOTS and another letter received,

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1642.—*February* 21, 1890.

CONTENTS.

THE REPORT OF THE INTERNATIONAL PHOTOGRAPHIC CONGRESS.

THE official report of the International Photographic Congress held last year in Paris has been issued this week by the Minister of Commerce, Industry, and the Colonies. It contains a report of the opening speech of Dr. Janssen, the President, also brief reports of each of the sittings of the Congress, and, finally, the conclusions at which the Congress arrived in relation to the various subjects brought under its notice. The report is published by the *Imprimerie Nationale*, of Paris.

Some of the resolutions adopted by the Congress have already been criticised in detail by the photographic press, because of the official abstract of them published last autumn. Among those now given in detail, that relating to the terms used in photography is of much interest, for there is no doubt that the variety of words now sometimes employed to denote one and the same process is objectionable. The Congress proposed to lay down a basis for a rational nomenclature, by means of the following rules :—

1. The expression *photo* shall be employed, to the exclusion of the word *helio*, to indicate processes due to the action of light from any source whatever, and not alone to the action of solar light. The expression *helio* is exclusively reserved to indicate those processes only in which solar light is used.

2. The expressions *positives* and *negatives* are reserved to indicate respectively the images in which the effects of light and shade resemble those of nature, or in which those effects are reversed.

3. In that which concerns *photographs* obtained solely by the chemical action of light, the name of *phototypes* will distinguish those produced directly by the use of the camera. The name *photocopies* will be given to the reproductions of these by a new photographic operation by means of a sensitive surface acted upon by light.

The name *photocalques* (photosketches ?) will be given to reproductions made in the same way from non-photographic original designs.

4. Photomechanical prints, or *phototirages*, which may also be called *photoprints*, will be differentiated by the following appellations :—

To designate these different processes, an insertion will be made between the two radicals which form the word *photography*, and which will indicate the principal characteristics of the particular process.

According to this rule the word *photocollography* will indicate reproductions in various inks by processes in which colloids (gelatine, albumen, bitumen, and so on) are spread upon various supports, and rendered fit for inking by the action of light.

The word *photoplastography* will be employed to indicate processes in which a plastic substance changes its form because of the action of light, and returns to a thickness suitable for a coloured gelatinous ink.

The word *photoglyptography* will be used for processes of engraving in intaglio by photography.

The word *phototypography* will be employed for photographic processes of engraving in relief for use in the type-high letter printing press.

The word *photochromography* will be applied to printing processes for the reproduction of photographic images of several colours.

5. More extended designations of photographic processes or operations may be applied, so far as the French language is concerned, by introducing generic words preceding the necessary indications of the nature of the processes or operations.

For instance, the preposition *à* or *par* (by), according to the case, will precede the words indicating the nature of the sensitive substance employed, or that of the mode of operation ; and the preposition *upon* precede the words indicating the nature of the support of the preparations. The names of inventors, if they have to be used, can be placed at the end. EXAMPLES : — *Photographs*. — 1. Positive phototype ; iodide of silver on a metallic plate (Daguerre's process). 2. Positive photo-type ; collodion on a metallic plate

(Ad. Martin's process). 3. Negative photo-type, collodio-bromide of silver on glass. 4. Positive photo-copy, gelatino-chloride of silver on paper. 5. Positive photo-copy, in mixed colours (Poitevin's process). 6. Negative photo-sketch, ferro-prussiate blue paper (Motileff's process). 7. Positive photo-sketch, gallate of iron. *Photo-prints.*—8. Photo-collography, bichromated gelatine on ground glass. 9. *Photo-plastography*, coloured gelatinous inks (Woodbury's process). 10. Photoglyptography, by bitumen of Judea on steel (Niepce's process). 11. Phototypography, by bitumen of Judea on zinc.

6th.—For the designation of the divers applications of photography to special purposes, are reserved compound words obtained by prefacing the word photography, with radicals indicating by abbreviation the particular applications. EXAMPLES :—Chronophotography; the photographic production of successive images taken at accurately measured intervals of time. Microphotography; the photographing of microscopic objects. Heliophotography; the photographing of the solar surface. Spectrophotography; the photography of the spectra given by luminous sources. Uranophotography; the photography of celestial spaces. Chromophotography; the direct obtaining of the reproduction of colours by photography.

Such is the substance of the decisions of the Congress on this particular question. It will be noticed that the Congress has not vainly attempted to introduce French terms into photographic circles all the world over, but has culled, as customary in the scientific world, from the Greek. The Congress has, in this matter, accomplished some useful work, in attempting to bring chaotic nomenclature into something more resembling law and order. How far the improvements it advocates will—either before or after their revision by other Congresses—be brought into general use is another question. The higher the education of any scientific fraternity, the easier is it to introduce more accurate terms; indeed, chemistry and physics have seen vast improvements in this respect within the memories of many persons now living. The lower the education of any scientific fraternity, the more conservatively does that fraternity hold on to words it has once adopted, however unsuitable those words may be. Photography includes all sorts and conditions of men, so how any attempt to revise its scientific nomenclature will succeed, remains to be seen.

This year an International Congress, an outcome and continuation of that at Paris, will be held in Brussels, in which city also an International Photographic Exhibition will take place at the same time. At the Brussels Congress the late Paris Congress will be represented by a committee it has appointed, consisting of MM. Alex. de Blochouse (Belgium), the Prince de Molfetta (Italy), and Gylden (Sweden), honorary presidents; Dr. Janssen, president; MM. Davanne, Marey, and Wolf, French vice-presidents; MM. de Vylder (Belgium) and Petersen (Denmark), foreign vice-presidents; M. S. Pector, general secretary; M. Leon Vidal and A. Lende, French secretaries; MM. Wada (Japan), and Stanoiewitch (Servia), foreign secretaries; Col. Sebert, and MM. A. Martin, Cornu, de Villechole, Bordet, Perrot de Chaumeux, Warnerke, and Fabre, members. M. Macs, of Antwerp, the President of the Belgian Photographic Association, was present at the Paris Congress, and said that Belgium would be delighted to receive the Congress this year. M. H. Gylden, of Sweden, returned thanks at the Paris Congress for the warm welcome which had been given thereat to foreign visitors, after which the Congress came to an end at five o'clock, August 17th, 1889.

It is a remarkable circumstance that three photographic exhibitions will be held this year on the Continent, within easy distance of London and the larger part of England, by the night service of boats *via* Harwich. In the course of the year Brussels, as already stated, will hold its International Photographic Exhibition; another Photographic Exhibition will take place at Amsterdam, and at Antwerp will be an Exhibition specially devoted to Photomicrography.

FILMS ON GLASS SURFACES.

LAST Saturday, at the Royal Institution, Lord Rayleigh, in the first of a series of lectures on "Electricity and Magnetism," stated that glass has a great power of condensing moisture upon its surface. Some German observers, he added, have of late years discovered that it depends in a great degree upon the condition of the glass itself, and upon the alkali which the glass contains. The alkali causes it to attract moisture from the air around, even when the air is not saturated with aqueous vapour. Glass can be cured of this habit for a time by boiling it for five minutes. Much depends upon the kind of glass; for instance, flint glass behaves better in resisting the formation of these films than do the softer glasses usually employed for chemical apparatus.

In the course of the same lecture, Lord Rayleigh exhibited by means of the optical lantern some slides from negatives, which he had had to take by exposures of excessive rapidity even for what is called "instantaneous" work. He had photographed some falling drops of water so quickly that they appeared quite globular and not elongated in form, and had sharp, well-defined edges. The exposure and illumination were effected by means of a single electrical spark, given by the discharge of a battery of Leyden jars.

PHOTOGRAPHIC CLUB.—Wednesday, February 26th, monthly lantern night—ethoxo *versus* the new benzoline light. March 5th, "Artificial Light as an Auxiliary to Daylight."

THE INSTANTANEOUS PHOTOGRAPH, says the *Washington Post*, bids fair to become a very potent aid to artists who seek to teach their pupils that reproduction is not art; for it is clearly demonstrated by this means that the real is in nowise like the apparent. For example, an instantaneous photograph of a man in the act of running never looks as much like a man in the act of running as the pen-drawing of a true artist does. The reason is that the photograph reproduces the one exact position of the runner at the instant the picture is made, while the artist pictures several positions in one, and makes his man appear to be moving.

PHOTOGRAPHY IN HOLLAND.

Amateurs and Professionals.

In the February number of the current year of *Lux*—an illustrated monthly journal devoted to photographic interest, and published at Amsterdam under the able guidance of its editors, A. D. Loman, jr., and Chr. J. Schuver, for the furtherance of photography and all arts and sciences thereto related—we find an able article by Photophotos on "Amateurs and Professionals."

Were I, says Photophotos, a zoologist instead of a photographer, and supposing I was required to draw a distinction between the two above-named persons, this distinction would probably run as follows:—

Type: *Animalia Vertebrata.*
Class: *Mammalia.*
Order: *Bimana.*
Genus; *Homo.*
Species: *Fotograficus.*
Varietas (1): *Amateur.*
Varietas (2): *Professional.*

The difference between the individuals composing the first variety and those composing the second can, in the opinion of Photophotos, be confirmed by several distinctive marks and characteristics. For example, it will be generally allowed that the amateur is accustomed to make raids when he wishes to capture spoil or booty; the professional, on the other hand, lies, as a spider, in wait for his prey, and has generally a horror of the traitorous means employed by the amateur to accomplish his nefarious purposes. It is, moreover, to be noticed that the amateur is generally sociable—indeed, he might be called gregarious; while the professional, on the contrary, affects isolation, and loves to remain alone. One, however, of the most pronounced characteristics of divergency is undoubtedly the winter sleep or hybernation of the amateur; what time the professional, though feeling the season's difference, and by no means insensible to the rude attacks of Jack Frost and his cold confederates, nevertheless loses not his wonted wakefulness, and accosts with equal alertness, activity, and zeal the probable customer, whether that customer's waistcoat is unbuttoned in sultry August, or his teeth chatter in cold December. But the amateur, falling to sleep, poetically, with the fading rose and the exodus of the swallow, awakens not again for any care of customer till the rose returns, till the flowers again appear on the earth, till the time of the singing of birds is come, and the winter is past, and the rain is over and gone. Cases, indeed, have been known—but they are rare—in which the amateur has been aroused from his wintry sleep by the sunny brilliancy of a magnesium flash-light, when he will, on occasions, feebly partake of a little nourishment in the form of lantern plates of bromide of silver for sciopticon exhibitions.

The relation of these two interesting varieties to each other is mostly of an inimical and sometimes a malignant character, though, in some instances of perfect neutrality on both sides, a sound and lasting friendship may be found to subsist.

It is a sufficiently well known fact that photography, which was formerly practised only by professionals, has, in the course of a comparatively short period, spread itself widely among the most different ranks of society interested in it, partially from a scientific and partially from a business point of view. From the nature of things it must necessarily follow that the branch of photography to which the amateur directs his attention is very different from that which engages the thoughts of the professional. The latter has, we will say, a well appointed studio, and devotes himself exclusively to the study and practice of portrait photography in the widest sense of the word; the former, intimidated by the costly apparatus necessary to procure a really good portrait, and anxious in no small degree to avoid the labour—the normally requisite labour—of retouching, turns his 'prentice hand mainly to such outlying subjects as landscapes, *genre* pictures, instantaneous pictures, detective exposures, and photo-mierogravures.

Although Photophotos is by no means prepared to deny that portrait photography may be, and is, occasionally practised with no inconsiderable success by amateurs, it is, he thinks, as a general rule, advisable for them to busy themselves therewith only in a small degree, or still better, not at all. For this opinion he gives the following reason.

The condition of those who pursue photography as a profession is, no one will perhaps venture to deny, far from satisfactory. It has not been a favourable condition for some little time. Although this may doubtless in a great measure be ascribed to the increased facility in photographic manipulation—a fact which has brought studios and ateliers from the ground like mushrooms or Jonah's gourd—still the amateur photographers, or at least some of them, are mainly accountable for this unsatisfactory condition of their brother professionals.

What is indeed too often the case?

Take a respectable family rejoicing—or the reverse—in a youth, one of its members, with a passion for photography. This youth has managed to secure for himself some area of space, a courtyard—a garden, be it said, for politeness' sake—or even a chamber where, with the assistance of a friend who can retouch, he is able to take the portrait, always made ship-shape by the said friend, of some one or other of his associates; or suppose him visited by a nephew, a niece—a more dangerous visitant—in short, by any relation or acquaintance, but above all, by an aunt with small children, all of whom, with unmistakable signs, declare their desire, their ardent desire, to have their portraits taken by this able amateur. Then comes his moment of peril. He takes a negative, good or bad, as the case may be; they with one accord beg a copy to send home; they obtain it, send it, and no harm ensues. But if the plate pleases, if they long, like the daughters of the horse leech, or the unhappy Oliver, for more, then must the amateur at once put himself in a position of defence, and make use of such artillery of refusal as his experience has collected, or his imagination can suggest. If no better safeguards are procurable, such common forms of denial will serve as failure of time, pressure of business, inability as a mere amateur. Let him profess himself content with his work, but let him also add that if a really good portrait is required, the applicant must at once betake himself, and especially herself, to a professional artist. If the negative is really worth the trouble, the applicant will surely not grudge the payment of a reasonable price for as many copies as may be chosen to an accomplished workman.

But the case is considerably altered if the amateur, for divine charity's sake, or any other motive, is weak enough to bestow a dozen or more copies on the applicant. For the recipient, beguiled by this cheap method of acquisition, and totally blind to the errors and imperfections which swarm in the amateurish gift, conceives at once an antipathy to the professional photographer, who makes worthy

people pay for their portraits through the nose. He forgets that the labourer is worthy of his hire, and that the professional workman must be recompensed for his painfully acquired proficiency of skill, and the consequence is that he either ceases to visit the professional altogether, or visits him only to find fault with his prices, to cheapen a bargain, or to return pictures with which he is displeased.

Some people may think the foregoing description exaggerated, but its truth will be acknowledged by everyone who is practically acquainted with this subject, and is alone, therefore, able to give an opinion of value.

A portion of photography which may be cultivated with success by amateurs is the grouping of companies at festive gatherings, such as picnics, concerts, marriage breakfasts, cricket matches, and other diversions of a like nature. Little or no need is here of such technical knowledge and appliances as are indispensable to the photography of portraits. Besides, and in a measure owing to this, the artist will be far more satisfied with his work, and will, in addition, accumulate for his later years a fund of pleasing recollections which he may draw upon without let or hindrance at his own sweet will.

The *dilettante* must never forget that he pursues photography as a plaything, or, if this term be not sufficiently dignified, as a science or as an art, but not as a means of earning a livelihood; and such as devote themselves to this occupation for amusement should not complain hastily of the expenses or trouble which it necessitates or involves. "He who keeps a monkey," says an old adage, "must be ready and willing to make good any damage which may arise from his malfeasance." He must pay, like the amateur photographer, for the glasses he breaks.

It is only fair to add that some of the essential and most important services to photography have been rendered by amateurs, and from them will doubtless be stretched out in the proximate future many hands of support and assistance to this seductive art. Its varied fields of labour are indeed large enough for all.

It has been in several times and places asserted, with such degree of confidence as the absence of experience and knowledge can alone inspire, that the amateur will in the end destroy the professional, and survive alone as the fittest when the New Zealander acts according to Macaulay's imagination. Hitherto, however, there has been but slight sign of the professional's decadence, and it must also be borne in mind that the amateur is too frequently an amateur not in name only, but in deed. Witness, for instance, him who goes in summer to the Baarnsche Bosch to photograph and—drink Bittertjes. No! we need hardly make ourselves uneasy as yet concerning the future condition of the skilled and capable professional.

The existence of the amateur has in this article been considered as an important factor in the present evil condition of photography as a trade and calling. It is only just to mention also the far more important and deteriorating effect of the exceedingly low prices which are asked for portraits in several small studios. It is indeed unfortunate that the majority of people, who probably find even these prices sufficiently high, are unable to discover the low quality of such low-priced wares, wares which may well be called photographic offscourings and rubbish. It is through the existence of this trash that the intelligent artist suffers, and the grass, so to speak, grows on the threshold of his door. A radical medicine for this evil could be dispensed and made up with successful result if photographers would but unite and establish a definite minimum price for a dozen portraits.

Since the above was written, it has been ascertained that M. van Os has set such a plan in operation. In a late number of the *Fotograaf* some of the principal photographers of Amsterdam, as Woodbury and Page, Max Cosman and Koene, and Buttinghausen; of the Hague, as J. Ch. Mirande; of the Bosch, as Pierre Weynen; and of Nijmegen, as van Wens, have been reported as expressing their adhesion to the formation of a committee with such an object in view.

THE ACTION OF HEAT ON SODIUM CARBONATE.

FRESENIUS and other analytical authorities teach that, when sodium carbonate is moderately ignited and has lost all excess of water, &c., it undergoes scarcely any further loss; but that it loses materially if it is heated—even moderately—to incipient fusion.

Dr. Richard Kiessling has studied this subject more in detail, since the use of sodium carbonate as one of the fundamental chemicals in preparing volumetric solutions would become objectionable if its absolute stability were shown to be fallacious.

In making his experiments, he started from a bicarbonate which had the following composition :—

Sodium carbonate	64·4 per cent.
Water...	11·6 ,,
Excess of CO_2	24·0 ,,

A pure sodium bicarbonate of the formula $NaHCO_2$ has the following composition ;—

Sodium carbonate	63·114 per cent.
Water	10·711 ,,
Extra CO_2	26·175 ,,

Of the former a quantity of 6·170 gm. was subjected, on a watch glass, in a drying oven, to a gradually increasing temperature. At 65° C. there was no loss; at 70° C. the loss was very trifling; at 90° C. it had become quite material, and all of the extra carbonic acid was dissipated by heating to 125° C. The residue weighed 3·982 Gm., or 64·54 per cent. This consisted of sodium carbonate, absolutely free from caustic soda. It was now heated to 200° C., which caused no further loss. On raising the temperature to 400° C., however, a loss of 0·02 gm. (0·33 per cent.) was incurred, and the residue gave a decided reaction of caustic alkali.

On repeating the experiments in a platinum crucible, which permitted the employment of higher temperatures, the above results were confirmed. By increasing the heat to incipient melting, the residue gave a strong reaction of caustic soda.

It follows from these experiments that a perfectly homogeneous and standard sodium carbonate may be obtained by exposing the pure bicarbonate to a temperature of 150° C. until it no longer loses weight.

The author suggests to control the purity of the sodium carbonate by using potassium tetroxalate ($KHC_2O_4.H_2C_2O_4.2H_2O$) as a control-basis for volumetric purposes.—*Zeitsch. f. angew. Chem.*, 1889, 332.

CAMERA CLUB NOTICES FOR MARCH, 1890.—Monday, March 3rd, 8.30 p.m., smoking concert; Thursday, March 6th, 8 p.m., Mr. Andrew Pringle on "The Optical Lantern"; Thursday, March 13th, 8 p.m., lantern evening; Monday, March 17th, 8.30 p.m., lantern in operation (evening for testing slides); Wednesday, March 19th, 8.30 p.m., special smoking concert, and opening of members annual exhibition of photographs; Thursday, March 20th, 2 p.m., opening of conference and exhibition of apparatus at the Society of Arts by the President, Captain W. de W. Abney, C.B., R.E., F.R.S., papers from 2 p.m. to 5.30 p.m.; Friday, March 21st, 10 a.m., exhibition of apparatus in library of Society of Arts; 2 p.m., renewal of conference, papers from 2 p.m. to 5.30 p.m.; 7.30 p.m., annual dinner at Frascati Restaurant, Oxford Street (near Tottenham Court Road); Thursday, March 27th, 8 p.m., Mr. W. Willis on "Platinotype Possibilities"; Thursday, April 3rd, 8 p.m., lantern evening; Monday, April 7th, 8.30 p.m., smoking concert.

ATHANASIUS KIRCHER, THE INVENTOR OF THE MAGIC LANTERN.

II.

BY JAMES MEW.

BEFORE coming to a consideration of Kircher's already mentioned work, the work most important and interesting for the photographer, the "Great Art of Light and Shade," some more of the celebrated Jesuit's compositions merit attention as not only in themselves curious, but as bearing rich testimony to the wide and varied character of Kircher's intellectual study and attainments. No regard will be had of date in the enumeration of these books; concerning their size, it has been already said that they are mostly in ponderous folios. Dipping, then, our hand into this learned lucky bag at a venture, we draw out first what may well be considered a prize, bearing the title of "Polygraphy, or the Artifice of Tongues," a marvellous volume expounding a project of universal writing, and containing instructions for the composition and unravelment of secret ciphers. After this we light upon the "Egyptian Œdipus," a work in three volumes, the fruit of the arduous toil of twenty years, now read by linguists only with a strange sensation of wonder. Two more works, almost equally astonishing in their different respects, follow the "Œdipus;" one the first scientific work on the Coptic language, under the title of "Prodromus Coptus;" the other, "China Illustrated by its Monuments, Sacred and Profane." It has been said that both these books abound in errors. How far this statement is accurate the learned reader can, if he chooses, decide for himself. Next we have the "Specula Melitensis, or Watch Tower of Malta," a work dedicated to the Knights of St. John, and containing a description of rare physico-mathematical instruments. It is worth while noticing in passing that a curious misconception has arisen with regard to this work from a confusion between *specula* and *speculum*, which has led many to suppose that it is a treatise on burning glasses, with which instruments, indeed, Kircher was much concerned during his residence at Malta. The "Ecstatic Heavenly Itinerary" gives an exposition of the planets and fixed stars. The "Noah's Ark," in three books, treats of matter before, during, and after the deluge. Then we have a "Diatribe" on some wonderful crosses which appeared on men's garments and elsewhere, an "Arithmetology" or treatise on the hidden mysteries of numbers, a "Phonurgia," a "Physiologia," a "Mystagogic Sphinx," a "Tower of Babel," a "Subterranean World," and a "Great Art of Knowledge." The titles alone of these works will surprise the reader, though they give but a faint idea of Kircher's intellectual activity. His literary correspondence extends to fourteen volumes. We find in these volumes letters addressed to him from the principal men of his day. Turning then over at haphazard we come upon one from the celebrated Leibnitz, who speaks of Kircher's enduring merit, and, punning on his name Athanasius, prays for him the *immortality* he deserves.

But it is high time to take in hand that book which chiefly interests us.

The first edition of Kircher's "Great Art of Light and Shade" was published at Rome in 1646. The second edition, much more copious than the former, at Amsterdam in 1671. The whole title of the work runs thus:—"Athanasius Kircher's Great Art of Light and Shade, digested in ten books, in which are shown for many uses of mortals the wonderful powers and effects of light and shade in the world of universal nature, by a new and varied exhibition of novel and recondite instances and ensamples." The title page bears the mystic figure of a sun with a Hebrew quotation taken from the Psalms (139, 12), which, being literally translated, signifies, *As its darkness is, so is its light.* The author, after saluting the Philomath, or learning loving reader in his preface, thus addresses him:—"The same thing appears, O reader, to have happened to me as happened to that young man mentioned by Crassus in Cicero's work, *De Claris Oratoribus*. For he, walking one day and meditating idly by the seaside, lit by chance upon a thole, or peg to which the oar was commonly strapped, lying half hid amidst the seaweed and the sand. Taking it up and finding it unbroken, complete, and fit for service, he procured for himself, so that the little instrument might not remain useless, an oar, and having attached the oar to the thole, and being delighted with the contemplation of what he had done, went on to purchase a mast, and after that sailyards, which he set crosswise on his mast in due order. Not content, however with thole and oar, with mast and sailyards, he got sails and ropes, and so, by degrees, continually adding to his incomplete endeavour, at last fitted out a perfect ship, in which he sailed over sea and acquired much riches." Thus, says Kircher, have I also acted. For my little work of ten small pages has grown gradually into a large volume of ten big books. Starting from the thole of a stray remark suggested to me in the course of my precedent study, I have furnished out a ship which has sailed, so far as it is permitted to the frailty of the human mind to guide its course, through the immense ocean of aerial space, and so have I found and exposed as common merchandize to the world treasures of light and shade as yet unknown, in this my work divided into ten parts, as a ship furnished with ten banks of oars; and this division into ten parts has been suggested to me by the analogy of the ten divine rays which the Hebrews call *Sephiroth*, and the Latins *Emanationes*. And just as the wise Jews affirm the world to have been built by the ten rays of the divinity, so have we constructed upon our ten foundations of books our own little world of light and shade.

Kircher's first book is concerned with what he is pleased to call *Sciagnomics* and *Chromatics*. "Having ridden," he says, in a chariot far more sublime than that drawn by two dragons which was presented by Ceres to Triptolemus, through the varied orders and classes of nature, "I was astonished by the admirable marriage of the sidereal and the terrestrial world, in which ceremony Light officiated as a bridesmaid. Having afterwards discovered that there exists nothing in the innermost recesses of the mundane mass save that which has the principles and elements of its composition from light and shade, I succeeded, by varied combinations of these, in building up a new *Photosophy*, which, of its own natural fecundity, produced two daughters, *Sciagnomice* and *Chromatice*, which again produced wondrous births, described at large in my first book."

The second book of the *Ars Magna* treats of *Radiations*, or, as Kircher calls them, *Actinobolisms*. "When," he says, "I perceived that all things are affected by the wide-extended dominion of light, owing to a certain spherical diffusion of its forces, I built up at once the art of actinobolisms of things in nature, which again in their turn produced *Echocamptice*, or the radiation of sound; *Osmetice*, or the radiation of smell; and *Optice*, or the radiation of sight, besides other matters of rare doctrine and curious experiment, which are fully set forth in my second book."

The third book introduces the reader to the doctrine

of *Conic Sections*, and comprehends an apparatus of *Gnomonics*. "When I considered," says the author, "that shade is constant, whereas light affects motion, and that this motion of light is the sole base and foundation of all astronomy, the gnomon became my pen, any assumed plane my paper, shade my ink, and the Sun the artificer's hand, and the several natures of gnomon, plane, and shade, or pen, paper, and ink, are declared in my third book."

The fourth book is wholly concerned with sun-dials or horologes, Italian, Babylonian, and others.

The fifth is divided into *Gnomonic Ouranography* and *Gnomonic Geography*. *Ouranography*, or the description of the heaven, originally the title of a work by Democritus, comprehends the doctrine of the *Primum Mobile*, the description of *Almucantars* and *Azimuths*, and of the zodiacal arc on polar, meridian, vertical, and horizontal planes; with the whole system of fixed stars so described as to show both their risings and their settings.

The sixth book is called by Kircher the *Sciatheric Proteus*. Some of the readers of this paper may stumble at the word *sciatheric*, but this will become clear to them by the consideration that *sciatheras*, or shadow-catcher, is the Greek term for the gnomon of a sun-dial. Another title given to this book by the author, who rejoices in long words, many of which are his own invention, is the *Figured Astrolobiography*. It treats at great length of the mechanical construction of horologes, horoscopes, astroscopes, horolabes, astrolabes, and gnomonic globes.

And now, says Kircher, in his preface to the seventh book, which he calls the *Anacamptic* or *Reflected*, as he calls his eighth the *Anaclastic* or *Refracted Art*, and now we shall behold light instinct with some Promethean skill, delineating with its golden pencil the immense volumes of the heavens in the dark lurking-places of our homes so deftly that we, though shut up in a narrow hovel, may feel ourselves placed in the open fields of air, and wander over the universal ways of the sidereal world, and behold sacramental mysteries hitherto unseen. And this is our *Anacamptic Art* or *Reflected Astronomy*.

And again I observed that where light or shade passes into the recesses of a denser medium, it fallaciously withdraws itself, and affects manners altogether exotic, now stretching itself longitudinally, and now curving itself into I know not what of curvature after the fashion of a hedgehog or land-urchin. On this hint of occasion, I built up my *Anaclastic* art, or *Refracted Astronomy* through which it is given to all to hunt after heaven's unapproached riches with the weaving of an astronomic net beneath the water by an artifice singular, and hitherto unknown. In this book are tables for the compilation of refractions, an anaclastic table of rays incident in wine, oil, &c., after the author's observation. A paragraph on the refractions of the atmosphere is succeeded by a table of the refraction of the stars. We also meet with the construction of vertical and horizontal anaclastic astrolabes; the construction of an astrolabe in a concave hemicycle or hemisphere, showing nothing unless previously filled with fluid, which he calls the horologe, or deal of Ahaz; and the construction of an anacamptic-anaclastic horoscope.

Kircher's ninth book is called "Gnomonic Cosmometry," and is occupied with an investigation by means of light and shade of the position, magnitude, quantity, and altitude of the various mundane bodies, or parts of the world, and their distance from the earth. "Conceiving," says the author, "of light and shade as the most absolute geometer, and that the ingenious doctrine of conic sections came from no other school, and that the first elements and foundations of practical geometry arose from the proportions of shade to the unshaded, I concluded that nothing in this sensible theatre of the world was so remote that an approach to it could not be made by means of light and shade. Going therefore by their direction I attained the tops of the highest mountains and clouds, I climbed up to the tents of heaven, I measured by a new invention (*absit jactantia verbo*, let me be excused the boast), the quantities, distances, and depths of all heavenly bodies. Lastly, from this above mentioned supply of light and shade, as from a cornucopia filled to the brim, having selected some of the rarer and more recondite secrets by a certain hidden application of the active to the passive, I have constructed my "Magic of Light and Shade," by which is gained the threefold result of wonderful *horolabes*, *parastases*, or representations of things unseen, and by the aid of mirrors *paradoxical metamorphoses*, which new and rare matters have been deservedly reserved as the complement of all the books for the tenth and last of them."

It is this book on the "Magic of Light and Shade" which is the most interesting of all to the photographer, treating as it does of the application of their more hidden effects to the various uses of mankind. Of this book the first part is chiefly concerned with marvellous horologes, such as catoptric, heliocaustic, magnetic, sympathic, botanic, zoologic, rotatile, hydraulic, aquatic, and sympathetico-magnetic horologes. The second part treats of *Parastatic Magic*, or prodigious representations of things by means of light and shade. Under this part is included the artificial exhibition of aerial spectres; the wondrous paintings of nature on plants and stones; the exhibition of things by rays refracted in water; the construction of a machine by which images may be made suddenly to appear and disappear; the exhibition of wondrous spectacles by glass prisms; a disquisition of the author as to whether, according to Anaxilaus, Albertus, and Porta, houses full of serpents and other animals can be represented, and the display of fiery spectacles or *pyroparastases*. There are several experiments belonging to this last head, as the production of a fountain of fire, and of a dragon flying in the air, followed by a short discourse on the eagle of Regiomontanus and Architas' dove. Then comes a chapter on *Dioptrics* and the place and effect of lenses. The third part of this book deals with *Catoptric Magic*, or the marvellous representation of things by mirrors, and herein of mirrors, spherico-convex and spherico-concave, cylindrical, conic—as parabolic, hyperbolic, and elliptic—and caustic or burning. Then we find how to construct an artificial machine by which writings can be read at a remote distance, and then finally how to construct a *Thaumaturge* or magic lantern.

We have received from Mr. Martin a specimen of his Autocrat Magnesium Magazine, in shape like a powder flask, intended to contain magnesium powder, and to measure out, by a spring opening slide, a given quantity for the purposes of the flash-light.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION. — The annual meeting of the above Association was held on the 14th inst. The questions of reducing the subscription of professional photographers, and amateurs being allowed to serve on the committee, having been discussed, the report was adopted, as was also the balance sheet. Mr. Spiller was elected treasurer, and votes of thanks were passed to the late treasurer, to Mr. Harland, and to the president.

AN ISORADIAL FOCUSSING EYEPIECE.

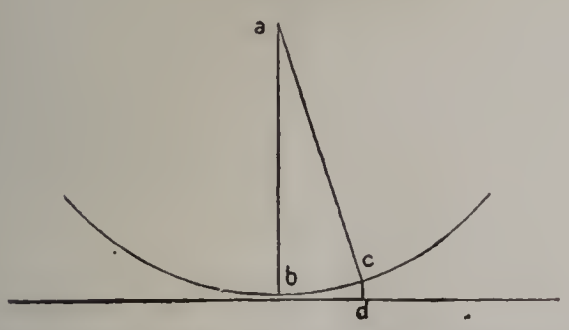
BY W. E. DEBENHAM.

As the subject of eyepieces for use upon the focussing screen of a camera has been recently brought forward in the columns of the PHOTOGRAPHIC NEWS, I send a description of one which, like that of Mr. Varley, described in the PHOTOGRAPHIC NEWS of the 31st ult., has been contrived for the purpose of examining portions of the field other than the centre, but which does not require fresh adjustment of the focus for each change of position.

In the eyepiece described by Mr. Varley the inclination of the instrument is effected by means of a ball-and-socket joint. As the centre of rotation is in the body of the instrument itself, the distance from the ground glass varies with each inclination. If a rather rough ground glass is used, the image will be focussed thereon, and slight differences of distance caused by varying but small angles of inclination may not place the image at a distance greater or less than the accommodation of the eye will make up for. When, however, a very fine surface is employed, it is, as pointed out by Mr. Varley, possible to obtain a sharp image which is not coincident with the ground surface, and, of course, with a focussing screen in which there are clear patches of unground glass, this will be still more easily done. With a smooth or semi-smooth surface, therefore, it becomes necessary to confine the plane of focus of the eyepiece strictly to the surface of the glass coincident with the plate, and to do this with a ball-and-socket arrangement requires continual adjustment of the focus of the eye-piece itself, as will be seen from the following diagram. This refocussing of the eyepiece will be found, if not quite impracticable, a difficult thing to accomplish on a fine surface covered with an image.

Let *a*, fig. 1, represent the centre of rotation. As the

Fig. 1.

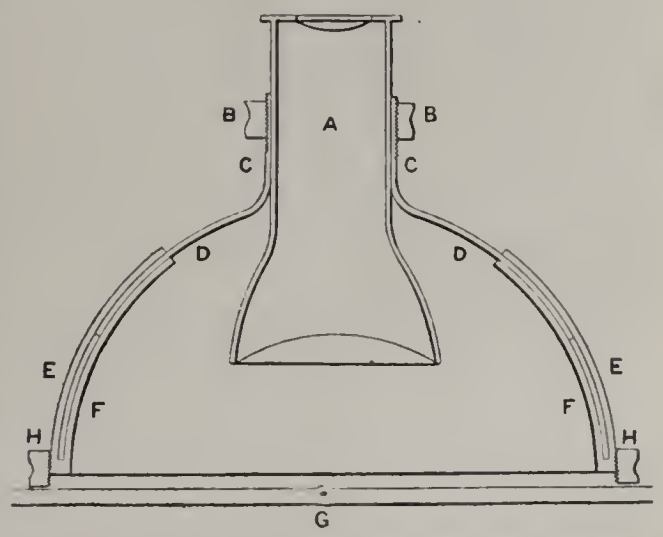


eyepiece is inclined, the focus, instead of remaining upon the plane of the ground glass, follows the arc *b c*, until at the latter point, which is distant only 20° from the vertical line *a b*, it is removed from the flat surface by the length of the versed sine *c d*. Supposing the distance *a b* to be $1\frac{1}{4}$ inch, which is about what would be indicated by Mr. Varley's dimensions, the versed sine for 20° with that length of radius being represented by ·06 × 1·25 of an inch, = ·075, or about the thirteenth of an inch—quite enough to put the image out of focus.

The accompanying sketch, fig. 2, shows a Ramsden eyepiece, A, of the construction in general use. There is the usual tightening nut, B, acting upon the thread on the jacket C. This jacket, however, is enlarged at D into a cup-like form, which slides between the surfaces of other cups, E and F. The latter are united at the bottom, as shown in the drawing. The dot at G indicates the centre of rotation, with which the surfaces of the cups are made concentric. The screw-ring H is for the purpose of distancing the whole system, according to the thickness of the ground glass, so that the centre of rotation may be in the proper plane.

It might be supposed that this centre of rotation should be on the ground surface of the focussing screen. This would be the case if the ground surface were outwards,

Fig. 2.



but as it is, the focus is interfered with, and lengthened by passing through the substance of the glass itself. It is owing to not taking this factor into consideration that photographers sometimes fall into an error when taking a negative through the glass, in order to obtain a non-reversed image, in supposing that, when focussing, an allowance must be made equal to the thickness of the glass upon which the sensitive film is spread, so as to keep the film at the same distance from the lens as that occupied by the focussing screen. If half the thickness of the plate is allowed, it will be nearly enough true for most purposes.

The objection to the use of the eyepiece, as figured, is the size of the cup or bell—about $3\frac{1}{4}$ inches in diameter—necessary. It might be reduced by making the whole thing on a smaller scale, but I am afraid is not likely to find much favour with those tourists who carry small cameras only. The convenience of examining parts other than the centre of the image, by the help of all the light available, should render it very serviceable not only to those who may be engaged in examining and testing lenses, but for many other purposes, such as that of focussing large groups, dark interiors, copies of paintings, and such subjects generally.

HALFPENNY INLAND POSTAGE.—Messrs. Erdmann and Schanz forward us a letter on this subject, from which the following is extracted:—"For the financial year ending 31st March, 1889, the Chancellor of the Exchequer received from the Postmaster-General £3,199,000. This represents $27\frac{1}{2}$ per cent. on the gross revenue, but the actual profit on the sale of stamps which are used for the transmission of letters within the British Islands is much larger. Happily, Mr. Goschen is likely to have a surplus by the 31st March next, and for this reason, among others, the time is particularly opportune for suggesting the introduction of a halfpenny postage for letters weighing less than a half ounce. The postage on letters to nearly all countries is calculated by the half-ounce. Why, therefore, should we be excluded from the benefit of being able to send half-ounce letters to residents within the British Islands at a lower charge than is now levied for an ounce letter?"

THE TEMPERATURE OF PHOTOGRAPHIC MANIPULATIONS.

ABOUT this time every winter season we get our regular line of letters containing questions involving difficulties in photographic working, that are due directly or indirectly to a total disregard of temperature. The old, old questions :—My developer stock bottle contains a number of crystals at the bottom ; will these make any important difference in developing? My toning-bath works slowly, and after going a certain distance the prints refuse to tone ; what shall I do to overcome the difficulty? I have had quite a good deal of trouble lately with my fixing bath ; the same brand of plates that I used several months ago, and out of the same box, take twice or three times as long to fix as formerly, and I use the same formula for bath ; please tell me the cause of the trouble—have the makers of the plates changed their formula of manufacture?

To all these questions, and a score of others, there is but one answer. Don't forget that the difference in temperature between June and January, for this latitude, may be as much as 96°, and that a difference of 25° may occur within twelve hours on any day in January. In summer, the fall of temperature from the heat of daytime to the cool of night has no harmful effect upon photographic processes, but in winter, when the day temperature is only 40° or 50° at best, a drop of 25° means a reduction of temperature below the freezing point of water.

As some of the results of these low temperatures in photographic operations, we may mention the crystallizing out of the salts in the stock solution of developers ; the mottling and blistering of albumen paper ; slow and obstinate toning solutions, together with hard negatives containing too much contrast.

In the case of developing solutions which deposit crystals it is very important that these crystals should be made to go into solution again, or the character and working qualities of the developer will be entirely changed. A change of temperature such as we have indicated above as possible at this time of year, would cause the separation of much of the alkaline ingredients of the developer, and a consequent slowing of its action from this cause alone. In case the developer bottle has become chilled and crystals have deposited, place the bottle in some warm (not hot) water for a short time, and then into water that is quite hot. Do not try to raise the temperature too quickly, or you will surely lose the solution from the fracture of the bottle.

The mottling and blistering of albumen paper can only be overcome by one method of working : always have the silver bath, the toning bath, and the fixing bath as near the same temperature as possible ; and be careful that this temperature is between 60° and 70° Fahr. Slow toning is also due to the use of baths at too low a temperature ; 70° Fahr., or even a little warmer in winter time, will be found to give the best results.

As to the character of the negatives produced in cold weather, they are usually hard from want of activity in the developer. Some writers have suggested that stronger developers should be used in winter ; but it appears to us that the best course to pursue is to keep up the temperature of the developer. Alfred Stieglitz, writing in the *Photographische Rundschau*, says :—"The temperature of the developer in slow development is particularly important ; for rapid development deviations are not so important." If the development is slow (and everybody should follow this method, as only by slow development the finest half tones can be realised) the developer must be kept at a pretty constant temperature 15° C. (60° F.) preferred, which degrees can be easily obtained in winter by addition of warm, and in summer by cold water.

By applying a developer of constant temperature, the time of exposure can be regulated much better. The first appearance of the image, after the plate is in the developer, depends always upon the following three conditions :—Time of exposure, concentration of developer, and temperature of the same.

A developer of about 13° C. (55° F.) acts ordinarily three to five times slower than it would at 15° C. (60 F.), that is, at a so-called normal exposure ; the plate would thereby become hard, while by an increase of temperature of the same developer to 17° C. (65 F.) with the same time of exposure quite a weak negative would be the result.

Cold developer gives hard negatives with correct exposure. For under-exposed plates it is, therefore, best to develop them with warm developer, as already proposed for instantaneous views ; care has to be exercised, of course, or the plate will become foggy.

The assertion that more detail could be obtained from a warm than a cold developer is erroneous ; the developer applied warm accelerates only the development of the shadows—that is, the negative remains soft, and will, therefore, furnish harmonious and handsome prints.

In short, I would recommend to everybody not to disregard the thermometer during the development of the plate.

To the above timely suggestions we would add that it is equally important to be sure that the fixing bath for the negative is not too cold, in order to secure negatives free from stain and that do not turn yellow with time. A cold fixing bath is slow-working, and although it may dissolve out the silver haloid, it may not cause the complete solution of the hyposulphite of silver, and a decomposition of the latter will make the negative turn yellow with age. Therefore, maintain a fair average of temperature (60° to 70° Fahr.) for all photographic manipulations, and very many if not all your difficulties in winter will disappear. —*Anthony's Photographic Bulletin.*

ENTERPRISING PHOTOGRAPHERS.—There are some enterprising photographers in Munich, as a well-known artist discovered the other day. He had seen some photographs which took his fancy greatly, one of the fairy-like palaces built by the crazy King Louis. Nothing would satisfy him but a visit to the spot for the purpose of making some sketches. Accordingly he set out for his destination, arrived at the romantic place where the castle is situated, and toiled up a mountain which he imagined commanded the view of the castle he had seen in the photograph. But when he reached the top of the mountain and looked at the castle, it did not seem the same as it had appeared in the photograph. He was greatly puzzled, for there was the front of the castle taken in the photograph staring him in the face, and no other part save the top of the mountain available for the planting of a camera. Yet the picture was different. He made enquiries, and discovered the reason. The photographer had had himself tied to a rope, and had been lowered a hundred feet or so down the perpendicular side of the huge rock, and so had obtained the view he wanted.—*The Picture and Art Trade.*

CONTINENTAL photographic societies will be busy this year, as no less than three exhibitions will be held, namely, at Brussels, Amsterdam, and at Antwerp.

PHOTOGRAPHY IN SWITZERLAND.

The Swiss *Photographic Review*, bearing the motto *Omnia luce*, published monthly under the direction of Dr. E. Demole, at Geneva, is the chief exponent of several photographic societies, as, for instance, of the Society of Geneva, of Lausanne, of Zurich, and of the Photo. Club of Neuchatel. This Review, which is now in its second year, contains an interesting article on some meetings of the Photographic Society of Zurich from July to December, 1889.

The author of the article, after alluding to a previous description of the transactions of the Society till the month of June last, notices the increased interest in the last six sittings of the bygone year, evidenced by the attendance on every occasion of more than half the members. In these sittings, the chief objects of curiosity and debate were the orthochromatic plates, and the new developers, hydrochinon and eikonogen, and many specimens and experiments of the working of these materials were submitted to the congress.

It will doubtless be of some interest to other amateurs to learn the several results of these varied experiments. By far the greater number of members had tried their hand with orthochromatic plates, and the outcome of their endeavours was so far satisfactory that the author asserts that the use of these will probably become more common, perhaps universal.

The experiments were chiefly concerned with Vogel and Obernetter's eosin silver plates, which certainly possess remarkable orthochromatic properties. It was, however, unhappily agreed upon by all the members who had meddled with these plates that, in a comparatively short time, a strange marginal veil was formed, developing a tendency to become even broader, so that, for instance, on a plate 13 by 18, after a short period, a picture of the dimensions 10 by 15 was with difficulty to be obtained. The author concludes that this defect has been occasioned probably by the use of unsuitable packing paper, and confidently hopes that the manufacturers will in future remedy this evil. The article says, Herr Scheuermeier, of Zurich, has lately manufactured orthochromatic plates of excellent quality, and such as show, even after the lapse of three months, no kind or sort of defect or alteration.

No good yellow screen is procurable in Geneva; those to be met with in the glass factories, made of coloured glass, are all far too thick and uneven; the glass plates covered with yellow collodion, and the yellow gelatine films display too clearly the injury arising from dust and other causes.

As far as regards developers, experiments were made by the great majority of the members with hydrochinon and eikonogen, which, as a rule, were sufficiently successful. It was, however, found that the hydrochinon developer procured from an emporium was not durable, and that the composition, after the flask had been once opened, without being further called into use, within the space of two or three weeks acquired a brown tint, and became utterly useless for the purposes of photography.

Even with the pulverized eikonogen, like results were attained. Many of the members, however, spoke in high terms of eikonogen developers made with good chemicals as quick and clean workers. In opposition to these newly christened agents, the ammonio-pyrogallol developer of the formula of Dr. Barbieri and his fellow-workers was praised as most successful and of the highest value.

In the positive process, aristo paper has now been for about a year principally employed, and this paper, says the author, is highly to be recommended to every amateur, not only on account of its durability, but for the reason of its many other good qualities. For toning, the combined toning and fixing bath is commonly used. But it does not invariably act as might be desired, and we give our readers the following gold bath recommended by Dr. Barbieri with the addition of a few drops of hyposulphite of soda—4 gr. sulphocyanide of ammonium, 200 c.m. water, 10 drops hyposulphite of soda, solvent (1 : 10), 10 c.m., chloride of gold 1·50, and as a solvent 100 c.m. water. The addition of the hyposulphite of soda produces colder tones. This bath is not durable.

Platinum paper cannot as yet claim the right of full citizenship in the photographic burgh. The experiments shown on this material seem not to have been taken with sufficient care; in every case the cautions as to the conservation of this paper appear to have been neglected.

It was resolved early in the spring of 1889 to make an attempt to facilitate the passage through the Custom Houses of photographers with highly sensitive preparations, as, for example, by the formation of dark-rooms at the principal seats of Custom, or by some course of instruction of the minor officers. As, however, no instance of damage or loss accruing from the want of such provisions was brought forward, the Custom House authorities declined to interfere with the matter for the present, but gave an assurance that they would not hesitate, as far as lay in their power, to put a stop to any impropriety of action on the part of their officers which should be brought before their notice.

The International Photographic Congress at Paris has interested itself particularly in this matter, and has resolved, as we are informed, to procure the erection of dark-rooms at the principal Custom Houses. It would, however, be a great help to any effort of this nature, if notice was at once taken by the Swiss Photographic Union of any ill or damage, so that later on, when a society found it advisable or necessary to take further steps in the business, the material evidence might be close at hand.

In the course of the meeting, several exceedingly interesting photographic novelties were displayed: objectives with iris diaphragms, detective cameras, instantaneous shutters, &c. In the November meeting, Dr. Barbieri showed a large collection, chiefly of objects of practical interest which he had collected and gathered together during his summer journey.

Dr. Weyl, of Berlin, has just discovered that the anaërobic bacteria exert a powerful reducing influence. They will reduce indigo blue to indigo white.

Lustrous Surfaces on Glass.—The following method of preparation of lustrous metallic surfaces on glass and glazed ceramic ware is described in the *Journal of the Society of Chemical Industry*. An aqueous solution of silver nitrate is mixed with a paste which when heated in a muffle at a low temperature will not fuse to the glass or porcelain, but can be readily detached from it. Suitable pastes may be made from chalk, earth, lamp-black, sulphur, madder lake, manganese dioxide, and oxide of iron. During the heating in the muffle the silver passes from the paste to the surface of the glass or porcelain, the paste is then carefully removed, and the article heated gently for a few minutes in a reducing atmosphere, preferably in carbonic oxide. An adherent lustrous metallic coating is produced which in transmitted light appears light yellow to dark green white, while the lustre varies in appearance from that of silver to greenish gold. Three parts of paste are used for one part of silver nitrate. Chloride or sulphide of silver may also be used, the former imparting a greenish and the latter a yellow colour.

Notes.

Most photographers have noticed the common resemblance which exists between middle-aged and elderly married couples, but they will scarcely be prepared to hear that this resemblance is also just as marked in the case of youthful husbands and wives. Professor H. Fol, a German *savant*, has been making some experiments on the subject, and out of seventy-eight young couples whom he photographed, he found that twenty-four bore a stronger resemblance to each other than that of brother to sister. In thirty the likeness was marked, and in twenty-four only was there a total absence of resemblance. What bearing this fact, if it be established, has upon the great question, "is marriage a failure?" is difficult to say without further data. If the history of these seventy-eight couples could be closely followed up, and it was found that the twenty-four pairs who were like each other were "happy ever afterwards," as the old story-books used to say, and that the twenty-four unlike had to seek the assistance of the German equivalent of Sir James Hannen, we should arrive at a decidedly valuable conclusion. Unfortunately for the present generation, at least half a century would be required to test the theory fairly. In the meantime it would be decidedly rash to advise two young people to marry simply because their photographs resemble each other.

The universal application of the electric light would be an enormous boon to photographers. Could the light be supplied cheaply, they would be rendered independent of fog and dark days, and in addition be able to work as well in the night as in the daytime. We believe that most of the leading photographers who introduced the electric light, working it from their own engines, have relinquished this method, not only on account of the expense, but by reason of the uncertainty. Those who do use the light take the current from the mains, but this can only be done in exceptional cases. Were the electric light pretty general, a dozen photographers would employ it where only one does so at the present time.

Another important branch of photographic industry would also greatly benefit; we refer to photo-zincography. The electric light here is indispensable, if a business is to be carried on satisfactorily. The enormous increase of illustrated papers, and the exigencies of competition, have brought the time allowed the photo-zincographer for the photography of drawings and the production of blocks within very narrow limits, and unless the electric light were used, business could not be carried on. The electric light can be obtained easily enough in the great printing centre of London, Fleet Street, but there is a serious drawback to successful results in the constant vibration. The use of the electric light in the suburbs would give enormous facilities to photo-zincographers, as here they would be able to work without the risk of doubling or thickening of the lines of a drawing.

The Turkish authorities have a strange horror of photography. A year or so ago all the photographs in the Pera shops of the Sultan's brother were seized, because it was suspected the prince was conspiring against the Commander of the Faithful. Two months after, the death took place in prison of a young Armenian whose only offence was that he photographed the pictures of the old Armenian kings, and now a German photographer has paid the penalty of a rash attempt to take an instantaneous portrait of the Sultan as he was going to the mosque. The gendarmes fell upon the unlucky man, smashed his camera, and carried him off to prison, where he lay three weeks. After that he was bidden to depart from the Turkish coasts, and was not allowed so much as twenty-four hours in which to wind up his business. Amateur photographers who think of going to Turkey had certainly better leave their cameras behind.

Painters will have a fresh grivance against photographers. At one time the painter was an indispensable official at all great ceremonial functions, such as royal marriages, christenings, funerals, and the like, and terrible work it used to be for the unfortuate man, as Mr. W. P. Frith, R.A., in his "Reminiscences," graphically relates. The difficulties of securing a separate portrait of each actor in the scene were enormous, and the wonder is that any artist could be got to undertake the commission. We manage things better now-a-days. When the Princess Louise of Wales was married to the Earl of Fife, the ceremony was photographed by Messrs. Byrne, of Richmond, and this photograph, we read, has now formed the basis of a painting also executed by the same firm. The transaction has a commercial ring about it, and artists may lament the decadence of the times in such matters, but on the whole the new order of things is much more comfortable for everybody concerned.

One peculiarity of photography is that in many cases it acts as a sort of barometer of public taste. An attentive study of the principal photographic print dealers' windows will generally disclose what is the fleeting fancy. Very recently there has been a sort of worship of muscle. All the strong men who have been exhibiting themselves on the music hall stage have had their torsos and biceps photographed, and that these photographs attract is shown by the gaping crowds. The pictures of the strong men certainly have an advantage over the photographs of prize fighters, who are generally posed in the most ungainly and vapid of attitudes, with the muscles inactive and flaccid, and suggesting anything but strength. Perhaps the photographing of Samson's and Sandow's arms will lead to the photographing of some famous pedestrian's legs, or the pectoral and spinal muscles of a contortionist. We do not say that such photographs are desirable, we only suggest what is likely to happen.

PHOTO-LITHOGRAPHY AND THE NEW ALBERT PHOTO-LITHOGRAPHIC TRANSFER PAPER.

BY HERMANN E. GUNTHER.

The following is a detailed description of the photo-lithographic process as it is in practical use in the most eminent printing establishments in Austria and Germany. I have very often had opportunity of seeing how successfully it is worked, and can therefore state that the firm of E. Jaffé and A. Albert, of Vienna, deserves much credit for having introduced the new transfer paper, which is a boon to all photo-lithographic workers.

The bichromate bath consists of :—

Water	1,000 c.c.
Bichromate of potash	50 grammes

To this solution, caustic ammonia is added until the reddish colour of the bath turns to a light yellow colour; an excess of ammonia does no harm. The temperature of the bichromate bath should be about 66° F. It is filtered into a flat dish of sufficient size, and the paper, with the prepared surface up, entirely immersed, and allowed to remain in the bath until it is quite soft. This is of importance, for, if it is not soaked long enough, also if the temperature of the bath is below 66° F., the bichromate solution will not enter sufficiently into the prepared film, and consequently, at the subsequent inking up of the copies, the colour will adhere but badly to the exposed parts, especially to the broader lines and surfaces of the picture.

If sufficiently soaked, the paper is removed, held over the dish so that the fluid flows off only at one of the lower corners, and allowed to drain until the liquid only drops. Then the two corners of the paper, which have been held, are given to a second person, who now holds the sheet over a plate glass a little larger than the paper. This plate-glass must previously be well cleaned, then rubbed in with talc powder, and the surplus of the latter dusted off with a broad, soft brush. On this glass plate the sheet is placed with its lower edge of the prepared surface, and smoothed down by means of a soft cloth. During this operation the person assisting holds fast the corners of the paper until the mounting is finished, and only gives slowly way to the pressure of the smoothing down.

If too much of the talc powder has been dusted off the plate glass, it may happen that the paper, after drying, partly adheres to the glass, and even tears here and there; it is therefore necessary that a certain amount of the talc powder remains on the plate, and better a little too much than too little. Should the paper, after entirely drying, still adhere to some parts of the glass, then the latter has been badly cleaned.

Care should also be taken that in smoothing down the paper no air-bubbles arise between the glass and the paper, since they will appear on the dry paper in the form of matt spots, which will interfere in the case of fine work. As soon as the sheet lies quite flat on the glass, the back of it is well rubbed with a soft cloth, applying thereby a certain degree of pressure to suck up the fluid on the back of the paper, and also to squeeze out the bichromate bath between the paper and the glass, and by this means to accelerate the drying process.

The glass plate, together with the paper on it, is now placed in a darkened, not too warm room, and dried spontaneously; after six to twelve hours it will be dried. This may be ascertained by touching the back of the sheet, and by the paper easily stripping off.

After stripping, the paper shows a beautiful, high gloss; it is now ready for copying, and must, of course, be kept in the dark. The sensitised paper should be used up within twenty-four hours, because if it is kept for a longer time it is more difficult to work. In the stripped state the paper should be kept in a not too dry place, for if it is too dry, or even brittle, no sharp copies are to be obtained with it, since it does not join closely to the negative. Besides, it is important to preserve in the paper a certain degree of flexibility, because it will then be possible to open one half of the printing frame in order to control the progress of the printing process, without fear of obtaining a doubled print. Should it, however, occur that the paper is too brittle, it may be placed between slightly moistened blotting-paper, but care must be taken that the transfer paper does not become too damp.

In printing, it is not necessary to use a photometer, since, as we have mentioned above, it is possible to watch the progress by opening one side of the back of the frame, provided that the paper is sufficiently smooth. The print should have a brown tone, and appear in visible relief from the ground. Over-printing is very injurious, because the lines and points of the image become thereby broader, and the development of the copy becomes difficult. If, however, it is under-printed, the colour does not adhere to the image in development, or, at least, it adheres only to the vigorous parts of the print.

Care should also be taken that the backs in the printing frame are not damp, because this is obnoxious to the sharpness of the print. Sometimes it will happen, especially in the case of copies from densely-drawn originals, and in the case of copper engravings, that certain parts of the negative will print too quickly; parts of this kind are varnished on the back with carmine, as it is usually done in the case of negatives with half-tones.

The inking of the transfer may be carried on in different manners, but in all cases it is essential to lay on a light colour-tone evenly over the whole of the copy. This may be done by means of a sponge or a rag, as well as with a velvet roller; the main point is always the result. The manipulations are as follows:—The smooth face of a lithographic stone is, by means of an ordinary lithographic leather roller, inked up with good transfer ink, and the velvet roller, which perhaps serves the purpose best, carefully charged with a thin coating of the ink; then the copy, which has been placed on an even, smooth surface, is inked up with the velvet roller until it is evenly covered with a middle grey tone. The vigorous parts of the image should still be visible through the colour, otherwise too much ink has been applied. When the transfer is successfully inked up, it is placed in clean, cold water, but care should be taken that no air-bubbles adhere to the copy in the water, and that the back of the paper remains completely covered with the water. After ten to fifteen minutes the transfer is removed, the water allowed to drain, the copy laid once more with its back on the smooth plate, and the water squeezed out from the film side by means of fine tissue paper, which is done best by rolling over it with an old, clean lithographic roller, avoiding, however, carefully the formation of wrinkles, because, otherwise, the film will probably be damaged. The moistened transfer is now once more inked up with the velvet roller charged with colour. If, after some rolling, the image comes out quite distinctly, the paper, at the same time, being clear of the yellow colour produced by the bichromate bath, it is only necessary to wash off with a clean, very fine, and soft sponge

moistened with water the colour which still adheres to the unexposed parts of the impression. If, however, the transfer, after being inked up, appears still yellow, it must be placed, before the application of the sponge, once more in the water, and the inking up with the velvet roller must be repeated.

The ready developed transfers are placed between dry, clean, and perfectly smooth blotting-paper, and by gentle pressure freed from the still adhering water. Then they are fastened by means of drawing pins on a board, and dried spontaneously on a slightly warmed place free from dust.

The dry copy is placed between damp blotting-paper. In the case of grained or stippled impressions, tissue paper must be used instead of the ordinary blotting-paper.

In pulling through the press for the first time, only a slight pressure should be applied, it being increased at each stroke. As usually, the transfer is several times wetted with water. After the last pulling through, the transfer is removed without again being wetted; if there is any difficulty in doing so, the stone may be taken out of the press, and placed for a short time in a cold room, or the transfer may be dried spontaneously. In both cases the removing of the transfer is facilitated.

The "rubbing-in" or intensifying of the image on the stone is done as usual, but in the case of very fine drawings, grained or stippled images, a very slow procedure will be necessary. The sponge which is used in intensifying should contain only a small quantity of the colour.

The etching may be done in the ordinary manner with slightly acid gum-water; in the case of fine drawings, however, it is recommended to apply a "sharp or high-etching" bath, it offering also otherwise some advantages.

For this purpose the transfer is dusted in at first with resin powder, then with talc powder, and the excessive powder carefully removed with a pad of cotton. Then two narrow, long strips of wood, about one-eighth of an inch thick, are placed on the two longitudinal edges of the stone, clear of the impression, and fastened at one end in any convenient way. Then a wooden lath, about three inches wide, 1½ inches thick, and a little longer than the stone is wide, is taken, covered with cloth, and moistened with sulphuric ether; it is then placed on the two wooden strips, at the end that has been fastened to the stone, and slowly pulled over the strips at full length of the stone. It is sufficient to go once over the stone in the manner described in order to melt the resin powder, together with the colour, by means of the ether vapours. Then the stone is etched for about one minute with the gum etching bath, which should be strong enough, so that it slightly scums if poured on the stone. The stone is then ready to be printed from.

With the same paper, transfers can also be made on zinc to produce relief blocks, and, indeed, it is used for this purpose by many large establishments. This process, however, we shall describe on another occasion.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical meeting, Tuesday, February 25th, at 8 p.m., at the Gallery, 5A, Pall Mall East.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday, Feb. 27, Mr. A. Haddon will give a lecturette and practical demonstration of "Glass Blowing as Used in the Chemical and Physical Laboratories." Visitors are invited.

"How shall we move the masses?" cried the Chicago anarchist on Christmas day. Just then an amateur photographer was seen pointing his camera out of a window—and the masses moved.—*Wilson's Photographic Magazine.*

DESTRUCTION OF DRY PLATES BY INSECTS.*

ONCE more an American industry is menaced and in danger of being proscribed in Continental Europe; this time it is the American dry plate that comes under the ban. The current number of the *Photographisches Wochenblatt* sounds the note of warning, and urges all amateur and professional photographers, under the circumstances, to beware of the purchase of any "Amerekanische Troeken-platten" (dry-plates), or keeping any upon their premises. The cause of this agitation is said to be the discovery of an insect which breeds in the emulsion on the dry-plates and films, and is said to prove as destructive to the plates as the potato-bug is to vines of that tuber; and if the pest once gains a foothold in any gallery, every plate and negative will soon be destroyed, and the place become infested as a barn or granary with weevil.

Since the above-mentioned urgent note of warning was issued to all Continental photographers, further particulars have reached us, together with the circumstantial account connected with the alleged discovery of one of the much-dreaded insects.

It appears that the son of Herr Isidore von Dunkelkammer, K. K. Geheim-Commerzien-rath, in Berlin, purchased from a local dealer a box of dry-plates of a celebrated American maker. On opening his purchase in his dark room, he found securely entrenched between the two packages of plates a nondescript bug or insect. The youth, who is an active member of the "Sonntags-Photographischer Jager-Verein," at once surmised that here was one of the much-dreaded insects, against which the note of warning had been sounded in the *Fach-blätter*. He reported the matter to his father, who, as an officer of the Government, felt the weight of the situation which rested upon him; repairing to the dark-room, von Dunkelhammer ordered that the animal be put in a vial and hermetically sealed, and sent to the "K. K. Academic der Naturlichen Wissenschaften." A special meeting was called for the occasion, when the extreme thinness or flatness of the specimen was much commented on, whereby it would be able to force its way between the sheets of glass or film as they were packed in merchantable packages. The vial containing the specimen, as an extra precaution, was enclosed in another bottle, which was also sealed, and was ordered to be made the special subject for the next regular meeting of the faculty a week hence.

When the day arrived Professor Raupe von Cassettenschieber opened the subject by stating that it was his sorrowful duty to inform the Academy that another American pest had appeared at the threshold of Europe, and threatened the ruin of one of the Fatherland's most beautiful professions and amusements, viz., die Kunst der Photographie, but that he had positive assurance that the Government would at once take the most radical steps to prohibit the introduction of any photographic material from America; in fact, that the Imperial Council would place the same interdict on American films and dry plates, as the Imperial Chancellor had placed on the American hog. The learned Professor was seconded in his remarks by Herr K. K. Hof-Photograf Weitwinkel; after which Dr. Aaron Eisenoxolat, inspector der Deutschen-reichs-Trocken-plätten, offered a resolution of thanks to all editors who had given publicity to the new danger which threatened to ruin every photographer within the realm, which was passed unanimously; after which Herr

* *American Journal of Photography.*

Rudolphsohn von Momentverschluss, who was also "Intendant und Geheim-Inspector des Staats-Detective Polizei," stated that by order of the Imperial Chancellor his department would at once take measures to seize all American dry-plates and films wherever found within the Empire, and that the confiscated material would immediately be taken to the Imperial Crematorium at Spandau, and there subjected to a heat of at least 2,400° Fahrenheit, which the Sanitats Behröde had judged to be ample to destroy any molecules or germs which might escape from the packages during the operation.

A further resolution of thanks was passed complimenting Geheim-Commerzien Rath von Dunkelkammer for his courage and diligence in capturing the dreaded insect, and his disposition of the same.

The members then adjourned to the Laboratory of the Academy for the purpose of making a thorough and scientific examination of the captive specimen, so that an exact description could be published for the information of the public in general. Special preparation had been made. Dry-plates of all known makers, domestic and foreign, were placed side by side, so as to allow the insect to pass over them consecutively, to see if any one make offered special attraction to the destroyer. It was concluded not to experiment on the subject with the various poisons, as in case any should prove fatal it would undoubtedly interfere with further investigation.

Not the least results were expected from the microscopic examination; this was to take place by the great bi-ocular-plano-electro-objective. For this occasion the subject was to be illuminated by an electric light generated by a purified current of electricity of at least 3,000 volts, Siemen measurement; this part of the investigation to be under the immediate supervision of the celebrated specialist, Herr Baron Natron-Ritter v. Fixirlösung, and "Reichs-Staats-Geheim-Insecten Anatanom" der Kaiserlichen Academie, who was himself an enthusiastic amateur photographer of no mean pretensions. After the specimen was brought forth, and taken out of its double receptacle, it was carefully laid under the objective of the great microscope. As an extra precaution, the receptacles which had come in contact with the insect were all treated with a 99 per cent. solution of the new disinfectant, "Eiko-Galliol."

After the focus had been properly adjusted, the learned Professor ordered the following description of the specimen to be inscribed on the bulletin:—

Genus.—Epizoa.

Order.—Hemiptera.

Head.—Small, from which project two long antennæ.

Eyes.—Compound, behind which are two transparent flaps covered with bristles, which are the rudiments of wings.

Thorax.—Broad and short.

Abdominal Segment.—Very large, broad, and extremely flat.

Colour.—Reddish brown.

It was further ordered that Herr Grobschmidt, the Librarian and Archivar, should properly classify and enter the subject as "Der Americanische-Gelatin-Brom-Trocken-plätten-zerstreungs-Käffer.

The members now in turn examined the subject under the microscope. Something of a sensation was caused when one Griffelschaber, a schoolmaster, and who was only a member by courtesy, ventured the opinion that possibly the learned President was mistaken in his diagnosis, as in his humble judgment the specimen under examination certainly bore a strong resemblance to the *Cimex lectularius vulg.* The schoolmaster was at once called to order and threatened with expulsion if he did not remember his position.

After the ripple caused by the above interruption had subsided, the specimen Käffer was subjected to a current of electricity of fully 8,500 volts, to insure its destruction, after which it was suspended in a vial of 95 per cent. alcohol, properly sealed and attested, and placed on exhibition in the "Museo der Academic."

When the action of the faculty was brought to the attention of the Imperial Chancellor, he at once entered upon the suggestions and issued the necessary edict, and as a sequence American dry plates will soon be excluded from Europe.

That this manifestly unjust action will be resisted to the bitter end by interested parties in this country, as the matter becomes known, may be taken as a foregone conclusion. It is hard to state what complications may arise if the German government persist in its course in the premises.

The initiative in the matter of retaliation was taken at the last meeting of the "Leopardville Camera and Tripod Club," where a resolution was passed: "Not to use any chemicals or photographic paper imported from Germany until the obnoxious edict reflecting on American dry plates be repealed."

A communication was also sent to the State Department at Washington, with the request that the matter receive immediate attention. In response, the Consul General at Berlin has been telegraphed to, and several messages have passed to and fro on the subject.

Personally, we have no doubt that taking into consideration the fact that the squadron of evolution is now in European waters, the whole matter will be amicably adjusted without delay.

There is some talk of a committee of the Royal Society being appointed to investigate the subject of colour-blindness, and the proper methods of testing the colour-vision of *employés* on railways.

Oxygen in Water.—At a meeting of the Chemical Society a paper was read on "A New Method of Estimating the Oxygen Dissolved in Water," by Mr. J. C. Thresh, M.B. The process is based on the observation that whereas, in absence of oxygen, nitrous acid and hydrogen iodide interact to form iodine, water, and nitric acid; in presence of oxygen the nitric oxide becomes re-oxidised, and, serving as a carrier of the oxygen, an amount of iodine equivalent to the oxygen present is liberated, in addition to that resulting from the initial action of the nitric acid; hence, deducting the amount liberated by the nitrous acid and by the oxygen dissolved in the solutions used from the total amount, the difference will be that corresponding to the oxygen dissolved in the water examined. The solutions used are:—(1) A solution containing ·5 gram sodium nitrate, and 20 grams potassium iodide in 100 c.c.; (2) a solution of 7·75 grams sodium thiosulphate in 1 litre, 1 c.c. of which corresponds to 0·25 milligram of oxygen; (3) a clear solution of starch; and (4) diluted pure sulphuric acid (1 : 3). The apparatus required is a simple one.

Hypo in Negatives.—An American writer says that he finds that a good way to remove hypo from negatives is to lay them face down in a dish or trough with a concave bottom. "If you make but few," he says, "an agate-ware wash basin does first-rate. The hypo falls from the film by its own weight, it being heavier than water, and in five minutes will be cleaner even in still water, than in ten minutes running water with face up."

DR. ANDRESEN'S EIKONOGEN PATENT.

No. 5,207. *Mar. 26th*, 1889.—The following is the complete specification of Dr. Andresen's patent entitled, "Improvements relating to the Development of Photographic Pictures":—

I, Momme Andresen, of 44, Melchiorstrasse, Berlin, in the empire of Germany, chemist, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to the development of photographic pictures by means of diamidonaphthaline $C^{10}H^6\begin{cases}NH^2\\NH^2,\end{cases}$ amidonaphthol $C^{10}H^6\begin{cases}OH\\NH^2\end{cases}$ and dioxynaphthaline $C^{10}H^6\begin{cases}OH\\OH\end{cases}$ as well as their sulpho acids:—

Diamidonaphthaline monosulphonic acid	$C^{10}H^5\begin{cases}NH^2\\NH^2\\SO^2\,OH\end{cases}$
Diamidonaphthaline disulphonic acid	$C^{10}H^4\begin{cases}NH^2\\NH^2\\(SO^2\,OH)^2\end{cases}$
Amidonaphthol monosulphonic acid	$C^{10}H^5\begin{cases}OH\\NH^2\\SO^2\,OH\end{cases}$
Amidonaphthol disulphonic acid	$C^{10}H^4\begin{cases}OH\\NH^2\\(SO^2\,OH)^2\end{cases}$
Dioxynaphthaline monosulphonic acid	$C^{10}H^5\begin{cases}(O\,H^2)_2\\SO^2\,OH\end{cases}$
Dioxynaphthaline disulphonic acid	$C^{10}H^4\begin{cases}OH\\OH\\(SO^2\,OH)^2\end{cases}$

As is well known in photography, it is the practice to treat the sensitive plates (prepared with chloride, bromide, or iodide of silver, or with two or all of the salts) after exposure with a developing solution, in order to bring to view the image produced on the sensitive plate. The developing solution hitherto employed for this purpose has usually consisted of a solution of oxalate of iron, pyrogallic acid, or hydrochinone.

Now, I have found by experiment that the before-mentioned substances, diamidonaphthaline, amidonaphthol, and dioxynaphthaline, as well as their sulpho-acids, are exceptionally suitable for developing photographic pictures produced on the said sensitive plates, and give better results than can be obtained with an alkaline pyrogallol developer, and excel the latter by giving the plates a blue black tint similar to that produced when developing in a bath of oxalate of iron, without in the least colouring the sensitive plate, but enabling the plate to better resist the alkaline action of the bath. I thus obtain the advantages possessed by known developing baths without their disadvantages.

A developing bath prepared with my naphthol-developer in which it is intended to immerse the sensitive plate after having been exposed, for the purpose of producing a visible picture is, for instantaneous photography, advantageously composed of the following ingredients:—

5 grammes of the hereinbefore described napthol developer.

15 grammes of sulphide of soda.

250 grammes of distilled water; and

5 grammes of potash.

The above proportions can, however, be varied, or one or the other of the ingredients can be substituted by others providing the essential part, namely, the before-mentioned naphthol developer is contained in the developing bath.

Instead of potash soda-carbonate, soda lye or potash may be used, in which case it is preferable to replace the before-mentioned 5 grammes of potash by 20 drops of a concentrated or saturated soda or potash lye, and this is especially recommended when diamidonaphthaline or its sulphonic acids are used. In the same proportion the quantity of sulphide of soda can be advantageously increased when alphanaphthol derivatives (such as amidoalphanaphthol) or their sulpho-acids as mentioned above, are used.

The before mentioned five grammes "napthol developer" may be used with any of the above combinations.

As any one of the "naphthol developers" is suitable for the present purpose, I find it is not absolutely necessary to restrict myself to the use of only one of the "naphthol developers" for the bath, so that the quantity of "naphthol developer" to be used refers also to mixtures of the above-named "naphthol developers."

After having immersed the photographic plate in this bath till the picture becomes completely developed, it is then fixed in the usual way.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

The process herein described of developing photographic pictures on coatings of chloride of silver, bromide of silver, or iodide of silver, or of any two, or of all three of them in combination, such process consisting in treating such coatings in a developing bath containing diamidonaphthaline, amidonaphthol, or dioxynaphthaline, or their sulpho-acids.†

PHOTOGRAPHING CHURCH ARCHITECTURE.*

BY THE REV. T. PERKINS, M.A.

WE often find difficulty in getting general views of churches and cathedrals, on account of adjoining buildings. Still, in many cases of parish churches we are enabled to get the best general view from the south-east. People did not like to be buried on the north side of a church, so that the grave-yards often extend furthest on the south side (the chief entrance generally being the south porch), and this allows us often to get sufficiently far away to the south-east to get in the whole of the church, tower and all, with a lens of moderately long focus. This is a thing to be aimed at, as if we get too close and use a lens of short focus in comparison to the plate, the tower is dwarfed, and the chancel roof rises too high on the picture, and the chancel itself is exaggerated in size from our being so much closer to it than to the tower. A sunny day, shortly after midday, when the eastern side of the tower is in shade, is the best time to choose for a view from the south-east. When we wish to make the tower the chief object, the best position is from the western side, but a little either towards the south or north; the church, however, itself does not generally look well from this position. In the case of cathedrals, the north side is generally to be preferred, the cloisters, the bishop's palace, or the deanery often proving obstacles on the south side. If we take a cathedral from the north-east, we must choose early morning or late evening in summer, as the whole of the building will be in shadow in our picture. The west front of a

* A portion of a paper read before the Camera Club, and published in its Journal.

† In the patent, "sulphide" seems to be a misprint for "sulphite."—ED.

cathedral is often well worth a plate. Generally speaking, the use of a wide-angled lens used to its full extent is to be avoided. It is often better to take a view of a portion only of the building than to endeavour to get the whole in at the risk of exaggerated perspective. In taking an interior, windows are often troublesome, as halation spoils the effect. Films, backed plates, or plates thickly coated on ground glass, should be used, as these decrease halation. A lens with a somewhat curved field is useful, as with it, if we are taking a view from either end, we can get the distant end and the nearer pillars and roof in fair focus together with a comparatively large stop; a lens whose focal length is about equal to the length of the longer side of the plate is generally the best. It is a mistake to endeavour to get too much in. I would strongly deprecate the use of wide-angled lenses for interiors; for general views of exteriors they are sometimes a necessary evil, but for interiors I would scarcely if ever use them. In the first place, the exaggerated perspective due to including too much on the plate is painfully obtrusive in an interior; and in the second place, the falling-off of illumination towards the margins is a serious drawback, as it generally happens that those parts included towards the top of the plate are the worst lighted. As I said just now, a lens with focus equal to the length of the plate, with the front raised so that the lens is opposite to a point about two-thirds up the plate, will be the best; a lens of the portable symmetrical type is the one I always use for this work.

A day when the light is diffused is better than one on which the sun, shining through the windows, throws patches of light on the floor and pillars. There is little fear of giving too long an exposure, as our object should be to get plenty of detail in the shadows. It is well, in fact, to over-expose, and develop slowly with a weak developer until all detail is out, and then to strengthen the developer or trust to subsequent intensification. It is often useful, if time is a consideration, to begin the exposure with stop *f*/32, and after a time to carefully change it to *f*/16 without shaking or moving the camera; the former gives sharpness, the latter shortens the time of exposure. In taking a general view from the nave it is well to get as far back as possible, and to place the camera a little to one side, say to the north, and to turn it somewhat to the south, so as to get the east window somewhat to the left of the centre of the picture. An artist making a drawing of an interior looking to the east would, I believe, construct his outline according to the rules of perspective, imagining himself to be standing outside the building, and drawing it as it would appear if the west wall were removed. The photographer cannot do this. He must be content, I think, if he desires to have a picture with pleasing perspective, to embrace only perhaps the eastern half of the nave, and not to attempt to get in his picture that part of the roof which he can only see by turning his eyes upwards. But not only is it worth while to take a general view of the interior; many charming bits may be got in most of our cathedrals looking up or down the aisles, or diagonally across the transepts, and individual monuments, and chapels, and screens are also often worthy of the exposure of a plate.

THE CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION will be opened on the 11th of March; the last day for receiving intended exhibits will be March 1st.

FOUR DIFFERENT PRINTING PROCESSES SUITABLE FOR COPYING TRACINGS.*

BY J. E. GOOLD.

I WILL briefly describe four different processes by which an exact copy of a drawing on tracing paper can be made.

Colas's Process, which gives a black line on a white ground, is now greatly in use for copying tracings; it prints quickly, and is very simple to work. The exposure ranges from five to ten minutes in the sunlight, and from twenty to forty minutes in the shade. I find the best results are got on a bright day, and printing in the strongest light. I have very often to reduce large drawings made on yellow tracing paper to a small scale to transfer to a stone for lithographic purposes, and use this process to get a more suitable copy to photograph from. To make a print, you put the tracing face downwards in the printing-frame, and place the sensitive paper on the top of it, then a piece of thick felt, and then the backs, and put a good pressure on by means of screws, which are much better than springs, as you are able to get a more even pressure. To ascertain if sufficiently printed, lift up one corner, and if the greenish-yellow tint has disappeared, except where covered by the lines, it should be taken out and immersed, face upwards, in a bath composed of gallic acid, 20 parts; alcohol (methylated), 200 parts; and water, 1,000 parts; and remain for about three minutes; at end of time, the lines will be up strong and black; it should then be thoroughly washed in running water for a quarter of an hour, and surface rubbed with soft sponge; then taken out and hung up to dry. The following will be found a good formula for sensitising the paper:—

Water	300	parts
Gelatine	10	,,
Perchloride of iron	20	,,
Tartaric acid	10	,,
Persulphate of zinc	10	,,

Apply this by means of either a broad, flat camel-hair brush, or a fine sponge, to a hard, well-sized paper, then hang up to dry in a dark room. To over-expose a print means losing the lines, and under-exposure gives a very dirty, neutral tint ground, and very faint lines.

Pellet's Process.—This is the best process I know of for copying tracings, it being much quicker than any other, and giving a brighter result, although there is more trouble in finishing the print, as it requires developing on a saturated solution of yellow prussiate of potash. The print must be allowed to remain for half a minute, then lifted out of the bath and hung up by means of American clips until the lines have developed up to a strong dark blue; then immediately lay face down in a tray of water to stop the action of the developer, and by means of an india-rubber pipe splash water on the back of the print. It must then be placed, and completely covered, in a bath composed of one part hydrochloric acid to ten of water for five minutes; now take out and well wash the surface, and rub with a broad camel-hair brush to remove the loose blue sediment that would otherwise remain; after again rinsing, hang up to dry, and the result will be a beautiful clean white ground with strong blue lines.

Ferro-prussiate Process gives a white line on a blue ground, but is not so suitable for copying tracings—(1) because you cannot very well alter anything on the print, and (2) a mechanical or architectural drawing cannot be tinted as

* A Communication to the Newcastle-on-Tyne and Northern Counties' Photographic Association.

in the other processes previously described, although it is a cheap and rapid method of printing from negatives of drawings, giving a blue line on a white ground, the exposure only taking from five to ten minutes in a good light. The great advantage is, the prints require neither toning nor fixing; all that is needed is to wash in a plentiful supply of clean water until the lines are dark, and the ground perfectly white. Or if a copy from a tracing, the lines should be quite white, and the ground a good dark blue.

Messrs. Halden, of Manchester, supply a paper which gives a similar result to Pellet's, and only requires to be immersed in one bath containing red and yellow prussiate of potash, and then rinsing in clean water. I have not been able to give this paper a fair trial since it was introduced to me, but have made one or two very fair prints.

STEREOSCOPIC PHOTOGRAPHY.

THE following is a portion of a paper delivered a few days ago by Mr. G. D. Macdougald before the Dundee and East of Scotland Photographic Association :—

In what does stereoscopic vision consist? That is a very difficult question to answer. We know the conditions, or some of the conditions, under which we have such vision, and can only say it is the natural state of matters set up in the brain itself by the combination of two distinct impressions. When we look at a stereoscopic photograph we become aware that we are imitating nature, we feel we have a near approach to natural vision. By the well-known device of taking two pictures a little distance apart we take another step forward. In viewing such pictures we become aware of very perfect stereoscopic impression. There is greater solidness and relief.

I can only speak to my own impressions, and I say that a good stereoscopic view gives me very great satisfaction indeed. Mr. Pringle says that stereoscopic impressions are only fit to amuse children or savages a few times. . . . . .

One might be tempted to think that, having two pictures photographed at about the average distance of the eyes apart, hardly any difference would be observable between nature and the delightful representation as seen in the stereoscope, yet there is considerable difference. In looking at nature the eye has to adjust itself in focus for the near and the far-away objects. Every photographer knows that while photographing a near object the back of the camera has to be drawn out farther than in the case of a far-away object. Some have gone the length of maintaining that our knowledge of distance when looking at a view is mainly due to the brains interpreting the continuous stream of telegrams intimating the various focussings of the eye. That, however, will hardly hold good, as in a stereoscopic picture all the focussing is already accomplished. The picture being really flat, the eye has no focussing to do.

Any one possessed of a stereoscopic picture of some place to which he can get access may easily carry out an experiment on this point. Comparing his impressions of nature with the impressions as derived from the stereoscope, one quickly finds that the action of the eyes is decidedly different in each case. In looking at nature the eye has work to do, and feels the distance, so to speak, between each object. No such action takes place in the stereoscope.

But one may explain stereoscopic vision to his heart's content, and, after all, there remains the element of the wonderful in it. We confess to as much of the child or savage as to permit of a feeling of wonder at the possibility of combining two impressions by the mechanism of the brain itself. It appears to me there is something so many-sided about this fact as to indicate its being a fruitful starting-point for many investigations—anatomical, physiological, psychological, and metaphysical. It at least permits of a slight insight into the working of the occult mechanism which lies between the action of the eye and the final translation of the eye's messages to our consciousness.

In conclusion, is stereoscopic work suitable for the amateur? I venture to say it is eminently suitable. While it allows of the exercise of as high art as any other branch of photography, it gives an undoubted helping hand to the worker who does not aim high, who may work under circumstances where high photographic art can hardly be looked for. In shorter language, its range is wider, and it gives hope of more return for labour. The amateur rank and file do not aim at large work. The conveniences necessary for large work are not to be lightly estimated by any one limited in one way or other by space, time, or cash ; and one or other of these things, in the case of three out of four amateurs, comes in to limit his effort.

I shall state the advantages of a stereoscopic outfit from the amateur's point of view :—

(1) Compactness of apparatus. (2) Great certainty of producing a pleasure-giving result under disadvantageous circumstances. (3) Suitability for production of lantern slides directly. (4) Suitability of apparatus for taking single pictures of artistic proportions, and large enough for most amateurs.

ISOCHROMATIC OR ORTHOCHROMATIC.

A WRITER in the *Swiss Photographic Review* objects to the words orthochromatic and isochromatic, as signifying a different thing from the meaning they are intended to convey. "Now, what is to be defined? A process by which we correct the incapacity of the ordinary plate to render exactly the value of colours. According to the dictionaries, isochromatic means of uniform tint; as to the word orthochromatic, it seems to have been invented for the purpose of commercial competition with the first. The two Greek adjectives *isos* and *orthos* are nearly synonymous, and signify both of them "equal, right, true"; the two words in question would, therefore, be translated by: a process giving the exact colour. Now, as the artifice thus qualified does not give colour, it is necessary to have recourse to a cumbersome paraphrase in order to translate the thought of the coiners of these words: a process by which the colours of the objects do not prevent them from being reproduced with their proper luminous value. I would therefore propose the use of a better word—*orthophotic*—that is to say, a process giving the exact rays."

To these remarks the editor of the *Swiss Review* replies as follows :

"We are happy that our correspondent has raised this interesting question. It is true the vocables *iso-* and *orthochromatic* have but an erroneous and conventional signification. The word *orthophotic* seems preferable, but is it very correct? Our eye classifies the seven colours of the spectrum, according to the luminous intensity proper to each ; the photographic plate is impressioned by these same colours, not in the ratio of their luminous intensity, but in accordance with the chemical property which each possesses, more or less, of decomposing the silver salts. The physical action of shining which strikes our eye, and the chemical action of destroying which impressions the plate, do not move in parallel directions. Our eye is *orthochromatic*, the ordinary plate is *orthoactinic*. Does the word *orthophotic* well convey the meaning of the chemical properties of the rays of light which are alone to be considered in photography? This does not seem to be so, and we have here, we think, something wanting, It is not the *luminous* action that the word should recall, it is the *chemical* action. We have just said that the ordinary plate is also *orthoactinic*, as it exactly renders the relative powers of the diverse rays to decompose the bromide of silver. A plate that did not express this relative power, a plate in which the actinism of the rays was palsied, in which the green

and the red would end by attracting the bromide of silver in a certain measure, would possess properties outside of those of the ordinary plate; it would no longer be *orthoactinic*, but rather *paractinic*. Now this is the property of iso- and orthochromatic plates. We ask our correspondent if this word suits him."

Correspondence.

PHOTOGRAPHY IN NATURAL COLOURS ON SILVER PLATES.

SIR,—In your article on "Photography in Natural Colours on Silver Plates," in the YEAR-BOOK, you mention only one name connected with the development of the method which may be termed composite heliochromy, and only to remark that his (Hauron's) method "is occasionally re-invented," &c. Inasmuch as I have done more actual work in this line, and written more upon this branch of the subject than anyone else, you will no doubt allow me to call attention to the fact that my own method is a more radical departure from that proposed by Hauron, than was Hauron's from that proposed by Henry Collen in 1865. This must be admitted if it is true, as I assert it to be, that my method is the first and only one which is based upon, or which is consistent with, or which in any way recognizes the modern theory of colour vision which distinguishes between primary spectrum colours and primary colour sensations. Hauron and Cros would have made photographs by orange, green, and violet light, for projection by orange, green, and violet light, or for pigment prints in exactly complementary colours. A recognition of the theoretical distinction I have mentioned involves the production of a photograph by the joint action of red, orange, yellow, and yellow-green spectrum rays, in definite proportions; for projection by red light, a photograph by the joint action of orange, yellow, yellow-green, green, and green-blue spectrum rays, in definite proportions; for projection by green light, &c.

It seems to me that nobody who knows this can help admitting that there is a radical difference in the methods, as well as in the principles involved, and that this difference is of exceeding importance. FRED. E. IVES.

911, *Filbert Street, Philadelphia, Feb. 7th.*

PHOTOGRAVURE.

SIR,—In reply to Mr. E. Frewing's letter in yours of the 14th inst., I am sorry that a slight error had slipped into my description of Mr. Carl Eckstein's litho-photogravure process. There is, of course, no asphalt at all applied to the second stone, and the passage in my letter, page 99, should therefore run thus:—"As soon as the desired depth of etching is attained, the stone is removed to a trough and thoroughly washed in running water; then *the gelatine film* and *the colour of the stippled image* is washed off with turpentine," &c.

DR. HERMANN E. GUNTHER.

Patent Intelligence.

Applications for Letters Patent.

2,122. W. BENTLEY, M. H. SMITH, and F. WALSH, Crossley Street, Halifax, "Securing Caps to Lenses."—Feb. 10.

2,124. A. E. LEWIS, 70, Wellington Street, Glasgow, "Magic Lantern."—Feb. 10.

2,178. S. GURNEY and C. P. SMALL, 55, Chancery Lane, London, "Decorating Looking-glass by Photography."—Feb. 11.

2,211. G. MACKMURDIE, 8, James Street, Goswell Road, London, "An Optical Toy."—Feb. 11.

2,260. J. MARTYN, High Street, Southwold, Suffolk, "Cameras."—Feb. 12.

2,333. J. T. THOMPSON, 7, Battenberg Street, Liverpool, "Flash Light."—Feb. 13.

2,425. E. GALOPIN, 20, High Holborn, London, "Photographic Shutter."—Feb. 14.

2,444. E. K. PURCHASE, 166, Fleet Street, London, "Displaying Pictures by Rotation."—Feb. 14.

2,484. J. MARTYN, Southwold, Suffolk, "Flash Light."—Feb. 15.

2,485. W. H. HUMPHRIES and E. A. KING, 268, Upper Street, Islington, London, "Apparatus for Holding Photographs during Development."—Feb. 15.

Proceedings of Societies.

CAMERA CLUB.

Thursday, February 13th.—The Rev. A. B. W. WHATTON in the chair.

Previous to the lecture the HON. SEC. read an extract from an alleged old book entitled "Giphantia," published in 1761. This extract, which had been sent up by a member, Mr. A. C. Lyster, gave an account of a vision relating to photographic agency, said to have been experienced in Central Africa. A viscous substance received images which became fixed on removal to a dark chamber.

Mr. GRAHAM BALFOUR read a memoir on "Landscape," in which he dealt with the relative artistic merits of pure landscape and landscape with figures, and stated that he felt inclined to recommend the former; he preferred work done to satisfy the sense of beauty or art for art's sake. When figures are omitted where their presence might seem most desirable, their absence may be compensated by the introduction of well-chosen articles of human use. The effect of a desolate scene is usually enhanced by the absence of the human form, although there are exceptions: a solitary human figure in the vast expanse of the Great Sahara increases the feeling of desolateness, but such an adjunct is best left out in a landscape wherein its presence would be incongruous with the spirit of the scene. Mr. Andrew Pringle maintains that figures in landscape photographs are scarcely ever in the right place, and that it is better to leave them out. The old masters almost invariably introduced figures of men and animals, or suitable substitutes, into landscapes; but in these latter days painters no longer feel that course necessary, the truth being that in the olden time the feeling for beauty in landscape had not been born in the human race, for we live in days of new ideas and new conditions. The great appreciation of the external world, which has grown up within the last hundred years, is due to ideas externalised by modern painters and poets; also to the wonderful discoveries of science. In short, he denied the supremacy of ancient authority on this subject, and believed that we should not worship our ancestors as do the Chinese. Besides, painters have an object, which photographic workers in monochrome have not, of sometimes introducing figures to get a few bright points of positive colour in suitable positions. He thought beauty to be a sufficient quality for any picture to possess.

Mr. HUMPHERY considered the seeking for beauty to be one of the greatest curses of photography at the present day, for the human mind required something grander, something more suggestive than prettiness; it wanted soul, and soul could not be found in mere beauty. As to figures, the introduction of them would utterly spoil certain pictures, such, for instance, as those of the wild waves of the ocean breaking over the rocks; but there were other scenes, such as some of those of a rural nature described by Wordsworth and by Gray, in which the introduction of human and other figures enhanced the effect.

Mr. ASHBURY GREENE agreed with all that Mr. Balfour had said in his paper. Beauty should not be confounded with prettiness, for it includes scenes of grandeur and majesty, and in a beautiful scene he considered figures to be incongruous. It is absurd to use the term "beauty" as including only subjects which are merely pretty.

Mr. GEORGE DAVISON believed that there might be as much beauty in a simple landscape, or a tree, or a bit of a pond, as in grand scenery, and he did not think figures to be essential to pure artistic work. In the past, those who have posed figures in the attempt to represent them in motion, have usually failed, but the resulting un-

naturalness is not seen when a hand-camera with a lens of long focus is used upon a figure in action not specially posed. Fine art cannot be governed by any didactic reason of any description, for then it would become more or less a science.

Mr. E. R. SHIPTON remarked that in the old photographs upon the wall of the room in which the meeting was held, figures had been introduced largely into the landscapes, and those pictures taken in the old collodion days proved that photographers had not advanced as much as they ought to have done. He did not think that Mr. Pringle's attempts to introduce figures into landscapes had been generally successful, judging from the lantern pictures he had recently exhibited. He thought a thorough grounding in art principles to be essential to good artistic work, and did not think that more than one photograph in five hundred was worth calling a picture.

Dr. C. S. PATTERSON said that the objection made that figures are usually placed wrongly in landscapes is no argument against their being put in right positions therein.

The CHAIRMAN would ask, "What is beauty?" If the reply were that it is truth, then they were driven back to the old question, "What is truth?" He was utterly unable to grasp the idea of pure beauty. He could imagine the beauty of ideas; for instance, the idea of the mathematician about the fourth dimension in space, and could become lost in admiration thereat, and he thought that pictures are beautiful only when they start a train of ideas, for beauty cannot be reduced to mere symmetry. Early Greek sculpture began with the idea of pure beauty, or of art for art's sake, but, as it improved, it tried to convey ideas to the mind; in its early stages, Phidias and Praxiteles produced nothing but Venuses and forms due to "art for art's sake," but later on Grecian art tried to convey ideas, by representing wrestlers and other subjects full of action. Any picture, he thought, which had motive in it must include figures.

Mr. WILLIAM ENGLAND was of opinion that it is desirable to introduce figures into landscapes where it can be judiciously done, and that in some cases it is absolutely necessary. He had seen American stereoscopic pictures in which the introduction of the human figure gave an idea of the approximate height of the geysers in the Yellowstone Park. Sometimes the introduction of a figure will help to suitably break up a landscape foreground, and in the instance of a trout stream, the introduction of a man fishing was an improvement.

Mr. BALFOUR, in the course of his reply, said that in the term beauty he included grandeur, and that he considered prettiness to be about the greatest curse which could be called art. When figures were introduced, he strongly advocated the use of the instantaneous shutter. The great experience of Mr. England made his utterances welcome and valuable, but that evening they were rather outside the range of the subjects dealt with in his paper. When figures were introduced to give the scale of the dimensions of a geyser, he should consider the result to be more properly classified with diagrams than with works of art.

The subject on Thursday, Feb. 27th, is "Photography as Applied to Medicine," when a paper will be read by Dr. C. S. Patterson.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 13th inst. Mr. G. W. ATKINS occupied the chair.

With a view to test the question asked at a previous meeting, whether plates coated with collodio-bromide emulsion were subject to reversal of image, Mr. J. B. B. Wellington had during the week tried three plates, exposing for one minute, twenty-five minutes, and one hour respectively—the latter in bright sunshine. Although all showed more or less over-exposure, no trace of any reversal of image was observable.

Mr. W. E. DEBENHAM said the resistance to reversal of image might be due to the vehicle or the molecular condition of the film. It was a question whether a plate coated with gelatine emulsion made as slow as collodio-bromide would not offer the same resistance to reversal.

A question from the box was read, "When developing a plate which is known to be over-exposed, is it better to begin with the usual amount of pyro and bromide and a very small quantity of ammonia, and as the development proceeds to add more ammonia, or to use a solution weak in ammonia and bromide, and to add the pyro by degrees, beginning with only a very small quantity of pyro, and finishing with the usual developer?"

Mr. A. HADDON referred to Captain Abney's remarks, published in the YEAR-BOOK, endorsing the system of obtaining detail first and density afterwards, this method of procedure proving particularly successful in developing negatives of Swiss scenes. By commencing with a minimum quantity of pyro, details of distant snow-covered mountains, as well as the foreground, were obtained in the same negative.

Another question from the box: "Does anyone know of a formula for polish suitable for cameras, that can be put on rather thickly and finished at once?"

Mr. A. C. PEMBERTON said adding ether to French polish caused it to dry very quickly, but the article coated was not so satisfactory in appearance as when the French polish was used without the ether.

The CHAIRMAN said a good black for brass articles was made by dissolving copper turnings in nitric acid. The article, freed entirely from grease, was dipped into this solution, then passed through the flame of a Bunsen burner, and afterwards washed in water.

Mr. J. J. BRIGINSHAW exhibited two prints from negatives of the moon, taken recently with the great Lick teleseope. He believed this teleseope was provided with a second lens for photographic work.

A Member asked the foeus of the objeetive the negative was taken with.

Mr. A. HADDON said from the size of the image in the prints passed round he should say from 50 to 60 feet.

Mr. T. E. FRESHWATER referred to the exeellent negatives, full of detail, obtained of the moon by Mr. Lewis M. Rutherfurd, of New York, in 1863-5, with very rude apparatus.

The remainder of the evening was devoted to the optieal lantern. A varied and interesting selection of slides was projeeted on the screen, contributed by Messrs. G. W. Atkins, A. C. Pemberton, T. E. Freshwater, R. P. Drage, J. Teape, and J. B. B. Wellington.

WEST LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the above Society was held at the Addison Hall on the 14th inst., Mr. F. H. Low, M.B., in the chair.

The members were informed that Mr. Wilson intended to present the Club with a selection of photographic works for the library.

Mr. RONALD WHITING read a paper on "Reducing and Intensifying Negatives."

Mr. C. WHITING remarked that negatives which had been dried quickly by immersion in spirit, to drive the water off, are generally much denser than those dried in the ordinary way, and that a negative which was dry in some parts and not in others, on being put into the spirit and dried, was found to be almost twice as dense in the parts which had not been dry on immersion in the spirit. He also mentioned that if a very much under-exposed negative were simply bleached with mercury and then used, it would be found to be decidedly improved, for although the contrasts before were too violent, the bleaching remedied that to a large extent.

Mr. BLACKMORE said that he did not approve intensifying a badly under-exposed negative. It had its proper place, which was certainly not in the printing-frame.

Mr. R. WHITING, in replying to questions, remarked that the different processes of intensification he had described could be used with films, and he did not think there would be found to be any action on the celluloid backing.

The CHAIRMAN requested those members who had won medals at the late exhibition to send them to the secretary, as they were to be engraved with names and date, and he announced that a special general meeting would be held on the 8th of

March to consider matters relating to the Exhibition, except that the subject of the awards must not be touched upon in the sense of questioning any of them. The meeting of the 8th of March is not to interfere with the holding of the next ordinary meeting on the 28th inst.

HACKNEY PHOTOGRAPHIC SOCIETY.

MR. G. H. SLIGHT read a paper on "Retrospective Photography, from Personal Recollection," on Thursday last, going back over forty years. He illustrated his paper by showing some old wet plate negatives, positives, and prints. He liked the old process, and was loath to leave it in favour of the present dry plates.

Dr. GERARD SMITH, who began photography twenty years ago, said he liked it better, and it was admitted by a number of people to be better, seeing some plates were advertised "like the wet plate in results."

The SECRETARY announced that on the 27th an exhibition of "Apparatus" would be held, and invited members to send apparatus by six o'clock on that day. He said all the members would be pleased to hear that Mr. Hubert had secured a silver medal at the Royton Exhibition.

Mr. Dean showed some micro-enlargements.

Mr. Hart showed the photograph he had taken of the members at the preceding meeting. Owing to the camera being a new one, the drawing of the slide had caused it to shift, thus getting it a trifle out of focus.

The SECRETARY said he had been trying pyrocatechin (Dr. Arnold's formula), but could not recommend it, as it was too slow, and had no advantage over any of the developers now in use.

Mr. REYNOLDS wanted to know how to remove films off useless negatives.

Dr. GERARD SMITH advised salt and water.

Mr. Birt Acres was nominated as a member.

NEWCASTLE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE annual meeting was held on Tuesday, the 11th inst., in the Mosley Street Café, Newcastle-on-Tyne, Mr. J. P. GIBSON in the chair.

The election of officers was as follows :—*President*—Mr. A. S. Stevenson, J.P.; *Vice-Presidents*—Messrs. J. P. Gibson and H. R. Procter; *Council*—Messrs. M. Auty, James Brown, T. Galloway, J. E. Goold, W. Parry, G. Proud, H. G. Ridgway, J. Hedley Robinson, H. Shand, and L. Williamson; *Hon. Treasurer*—Mr. J. W. Robson; *Hon. Secretary*—Mr. Edgar G. Lee, 11, Beverley Terrace, Cullercoats.

The Treasurer's report showed a balance in hand of £2 13s. 3d.

The following were elected as members of the Association : Miss Annie Philipson, Messrs. W. R. Ferguson, W. W. Fry, A. E. Harris, W. Milburn, and Lyddell Sawyer.

Mr. J. E. GOOLD read a paper on "Four Different Printing Processes suitable for Copying Tracings" (see page 151).

Other printing processes were described by Messrs. M. Auty, Jas. Brown, J. P. Gibson, W. Parry, and J. Pike.

Some very fine photographs by Mr. Robert S. Redfield, Philadelphia, were exhibited by Mr. J. P. Gibson.

Messrs. M. Auty, Jas. Brown, J. P. Gibson, J. E. Goold, and W. Parry exhibited a number of photographs, the work of the past season.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A MEETING was held in the Mayor's Parlour, Old Town Hall, on Wednesday, Feb. 12th, Mr. J. T. COOK in the chair. One member was elected, and one proposed for ballot at the next meeting.

The exhibition of lantern slides for competition in class A was then proceeded with, Mr. F. Pierpoint manipulating the lantern. Eight members sent in six slides each, which, after being passed through the lantern, were voted for by ballot by the members present, with the result that the first prize silver medal was awarded to Mr. Porrit, and the bronze medal for the second prize to Mr. W. Joliffe.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

ON Feb. 10th the members of the above Club discussed the best light for use in the dark room, and submitted the several samples of glass to a practical test. For this purpose, pieces of Ilford rapid bromide paper were used, and an exposure of ten minutes was given. The following were the results obtained :—That exposed to the light of one thickness of cathedral green, after being in the developer for about one minute, was quite black, while that with two thicknesses was of a dark grey; that exposed to the yellow and ruby was still quite white; in about two and a half minutes longer, that exposed to the yellow began to show a grey, the ruby—the darkest procurable—following one minute later.

Mr. PAUL remarked that at previous meetings when he had recommended cathedral green to be used, he had never advised that it be used alone, but in conjunction with a screen of canary medium, and expressed his belief that if forty thicknesses were used, it would still be easy to fog a plate.

Mr. GOODHEW remarked that the safety, or otherwise, of a particular screen was largely influenced by the make of lamp, for one in which the burner was six or eight inches from the glass would be found much safer than one with the burner only two inches from it; also that one with two screens placed a few inches apart would be found much safer than with the same screens placed close together, although they apparently gave the same light.

The SECRETARY said that in choosing a light to work by we had the choice of two evils: either it was necessary to have a light that was practically if not absolutely *no* light—if it was desired to have one that would have no effect upon the sensitive film, however long exposed—or a light which, while promoting ease of working, would cause fog, if allowed to act for a comparatively short time. And, therefore, it was necessary under these conditions to choose one which hit the middle course; that is, a medium which would not show any trace of fog with the longest *necessary* exposure on the most sensitive plates. Anything which cut off more light than this was not only needless, but was an actual disadvantage, and detrimental to the best results, as nothing was more necessary than a good light to judge the negative by in developing, and for this reason he objected to such screens as had a mottled appearance (as cathedral green), as he opined that it made the judging of fine detail more difficult, and remarked that all knew the nuisance of emulsion on the back of a negative.

The vote of the meeting was taken, when it was found that canary medium and yellow glass were the favourites.

Next Monday, February 24th, Mr. George Davison (of the Camera Club) will give a lecture entitled "A Chat on Pictures by Photography." Visitors are invited to attend.

BRIGHTON PHOTOGRAPHIC SOCIETY.

THE first annual meeting was held on February 11th., the President (Dr. REAN) in the chair.

The SECRETARY read the committee's report, which stated that the Society now numbered sixty members. It also referred to the papers read during the year, which have been of a high class, and evoked considerable discussion. The lantern evenings have also been a feature, and have proved entertaining. During the summer months excursions have taken place to the most picturesque spots in the vicinity; these have been thoroughly appreciated. Two interesting competitions have also taken place, one for the best set of lantern slides being keenly contested.

The officers for the current year were then elected as follows :—*President*—Mr. W. H. Rean; *Vice-President*—Mr. W. Jage; *Treasurer*—Mr. J. P. Slingsby Roberts; *Committee*—Messrs. Bedford, Caush, Hardcastle, Graham, Perren, Mitchell, Tate, Webbing, and Wicks; *Hon. Secretary*—Mr. A. H. C. Corder, 42, Montpelier Road, Brighton.

The prints sent in for competition were on view during the evening. The judges, Messrs. Allen, Fry, Hunter, Graham, and Rean, awarded the bronze medal to Mr. W. Duddell. The silver medal was withheld, as, in the opinion of the judges, there were no exhibits of sufficient merit to justify their awarding it.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

February 6th.—General meeting ; Dr. TULLOCH, President, in the chair.

Mr. G. D. MACDOUGALD read a paper on "Stereoscopic Photography" (see page 152). Mr. Macdougald then gave a description of the lime-light jet used at the Society's lantern exhibition on the 29th ult.

Dr. TULLOCH exhibited an apparatus for magnifying lantern slides he had made from a design published in the current YEAR-BOOK. It consisted of a cardboard box with a plano-convex lens mounted at one end, the other end being made of ground glass. The lantern slide is placed in a groove sufficiently far into the box to throw the ground glass out of focus when the instrument is held up to the light to view the slide.

Beck's new camera, the "Pecrops," was on exhibition. Messrs. Beck had also two of their "Autograph" lenses on view ; one mounted, as usual, in brass, the other in aluminium.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

AT the meeting held on the 13th inst., Mr. W. JEROME HARRISON, F.G.S., occupied the chair.

The Birkenhead Photo. Survey slides were advertised to be shown, but as these were not ready, a very good substitute was given through the kindness of the following photographers and societies, who sent a number of slides for exhibition ; viz., Messrs. C. W. Hastings and H. Sturmey, the Camera Club, and the Leicester, Wolverhampton, and Coventry Societies. Those from the Camera Club were the new set of animal studies, and were sent out with very appropriate readings of particulars. The new club lantern was on view, and, at the close, some pictures were passed through.

It was announced that Prof. Muybridge would give his exhibition at the Birmingham Town Hall during March.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE regular monthly meeting was held on the evening of Jan. 14th, President C. W. CANFIELD in the chair.

Mr. F. C. BEACH read a paper on "Camera Shutters," and exhibited a number of different models. He thought almost all shutters were operated either by gravity, spring power, or pneumatic power.

Mr. CYRUS PROSCH exhibited a skeleton model of his present triplex shutter, and a model of the first one he invented.

Prof. L. H. LAUDY thought the word "instantaneous" should not be used, as there was not, and could not be, an instantaneous shutter. All required time to operate.

Mr. WM. T. GREGG preferred a shutter operating between the lenses, and exhibited a model of his diamond shutter, called such because of the diamond-shaped diaphragm it made. Very few shutters worked quicker than the $\frac{1}{100}$th part of a second, and the average about the $\frac{1}{50}$th of a second.

Mr. H. M. GRISDALE showed a combination drop and door flap shutter having attached spring hinges, designed to prevent the jar of the doors as they fly open. He also explained a model of a shutter (sector-shaped), in which a simple movement of one lever actuated by a spring operated two blades in opposite directions. He believed in having the apertures in the shutters considerably longer than the actual area of the lens, in order that a large amount of light may enter it.

Mr. F. C. BEACH exhibited a German prayer-book camera made on Mr. J. A. Harrison's principle.

Mr. A. PEEBLES SMITH made a flash-light exposure of the audience early in the evening, developed the negative, dried it, placed it in Dr. Just's automatic exposing and photo-printing machine, sent by the United States Photographic Supply Co., and exposed, by the aid of an incandescent electric lamp, thirty impressions on a continuous band of bromide paper. These were quickly developed with the eikonogen developer in large trays, fixed, cut off, and the prints presented to each member of the audience before the meeting broke up.

EXPERIMENTALIST.—Your letter affects a known person, yet you do not append your own name and address for publication.

Answers to Correspondents.

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

SPOTS (Buxton).—Small blue marks on silver prints. We have seen several instances of late very like yours, but of more pronounced character. If correct in our surmise, they are really small blisters, or places of loose attachment, where the gold toning solution has got underneath, and so acted in advance, or more powerfully than on the rest of the photograph. By soaking in water we expected to see corresponding blisters rise up, but no such result was apparent even when examined with a magnifier. Avoid the use of a freshly-made toning bath, and keep a look-out for anything in the shape of blisters.

A. M. M.—Inks for india-rubber stamps. No fatty or oily matter should ever be used, for they are apt to corrode the face of the stamp. Spirit solutions applied from a stretched flannel pad are commonly employed, the most suitable colours being extra dahlia for a violet ink, spirit induline for black, or this latter tempered by the addition of a little Atlas blue. All these colours may be procured of Messrs. Brooke, Simpson and Co., Atlas Works, Hackney Wick, E.

F. S. A.—The photograph of the Rosetta Stone, plate 278 in the British Museum series, will be of no use to you, for the inscriptions are not legible on account of the stone being covered with its protecting plate of glass. Apply to Messrs. W. A. Mansell and Co., 271, Oxford Street, W., to know whether they can supply you with any photograph showing the actual inscriptions. Even then you would require an enlarged copy to exhibit the details properly, or they might be sufficiently apparent if a transparency were produced and thrown upon a screen.

R. L.—Testing the speed of shutters. This problem would appear to be solved in a very simple and satisfactory manner by Mr. H. O. Hughes, who describes his apparatus in the YEAR-BOOK, page 109. He uses the swing of a second's pendulum, painted white against a black background, upon which a graduated arc is described, and lets go the mechanism of the shutter when the bob is oscillating regularly. The plate, when developed, will show how far the blurred image extends, and, consequently, the period during which the aperture of the lens remained uncovered. For further details, see the author's published account.

L. P. C.—A pamphlet entitled "Some Recent Advances in Photography," by Frederick E. Ives, reprinted from the *Journal of the Franklin Institute*, May, 1888, can be seen in the Patent Office Library, Southampton Buildings, Chancery Lane.

P. B. A.—The distinction between "professional" and "amateur" is not easily defined. Many so-called "amateurs" have at times sold their negatives, or furnished photo-sketches of passing events, ceremonials, &c., for which they have been paid. Others, again, may have filled temporary engagements, accepting pay, and yet long since discontinued to make any profit by photography. Another large class, of uncertain qualification, may be photo-mechanical printers, opticians, and makers of apparatus, or of various specialities demanded by photographers. The itinerant operator, who practises only during the season, and carries on another trade in the winter months, is, we suppose, a legitimate "professional." But, for an authoritative answer to these points, we must refer you to the newly appointed honorary secretary, whose advent to office at the annual meeting was hailed as a very satisfactory omen for the future prosperity of the Association.

W. M.—1. Where many copies are required, and in all really important cases, it is usual to print from reproduced negatives. 2. Varnish for negatives on Eastman's new rollable celluloid. Mr. W. H. Walker recently stated that his Company were experimenting with several kinds of elastic varnish, and that he hoped very shortly to introduce that which proved the most suitable for general use.

Received copy of the regulations of third annual Photographic Exhibition at the Crystal Palace, to be opened on March 11th.

A. C., T. S., J. C., and PHOTARGUS, in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1613.—*February* 28, 1890.

CONTENTS.

A MACHINE CAMERA TAKING TEN PHOTOGRAPHS A SECOND.

For some months past rumours have been published in various photographic journals in England and America, about the advent of an automatic camera to make a large number of consecutive exposures in a second, by the act of merely turning a handle. This camera has been invented by Mr. Friese Greene and Mr. Mortimer Evans, civil engineer. The object of it is to obtain consecutive pictures of things in motion, which can afterwards be rapidly consecutively projected on a screen, so as to reproduce, say, street scenes, with the horses, human beings, and other living things, moving as in nature. For instance, a cab may be seen passing in one direction, and a dog in the other. Mr. Muybridge, to produce something yielding approximately the same results, used from two to three dozen cameras, and made the exposures by means of a wheel electric commutator; these cameras took the moving objects from either two or three different points of view, so that, practically, he obtained but a dozen or two pictures of a continuous series of motions. The camera now under notice, however, can take a continuous series of three hundred photographs, so as to represent a long stream of street life as it is to-day. What would we not now give for a series of similar pictures representing street life in the days of Queen Elizabeth, with the dress and gait of the citizens of that time, and their antique streets and houses as a background?

In the scientific world such an instrument is likely to be useful. One well-known naturalist—not of the Camera Club, but a real naturalist—has suggested that by means of this camera, the actual motions of the legs of the centipede may be followed; with the eye this is difficult, because the animal has too many legs, and it is difficult for the observer to keep the reckoning, unless he be a Zerah Colburn or other "calculating boy." To the meteorologist it may be useful, when more or less rapidly worked, for showing the formation and dissipation of clouds. Mr. Friese Greene has already, by its means, photographed a spider making its web. This may interest Mr. C. V. Boys, who has also studied the characteristics of the spider, by placing the prong of a vibrating tuning fork, instead of a fly, in the centre of the web; the spider valorously laid hold of it, but observed that he had never seized such a muscular fly before. Next Mr. Boys tried a hot tuning fork, but as a hot fly was outside the experience of the spider, the spider at last took to his heels—supposing him to possess such—and looked on from a distance, with palpitating heart, at his demoniacal visitor. All this, and more, can the new camera photograph; but now it is high time to describe the instrument itself.

Fig. 1 represents the exterior of the machine camera, which is simply a box with a lens attached, and has also a winch handle protruding at the back. Its exterior dimensions are 8 in. by 9in. by 9¼ in. Mr. Mortimer Evans has recently improved upon this, by making a modified form of the instrument for popular rather than scientific use; this smaller camera is little larger than a "kodak," and will take a hundred consecutive pictures by the turning of a handle.

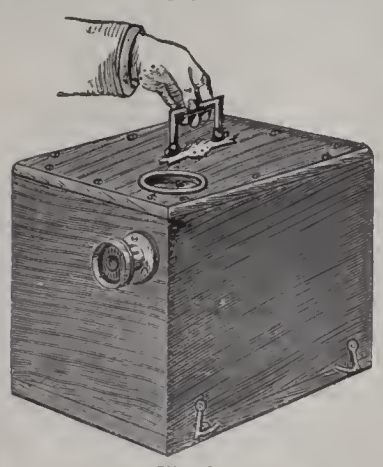


Fig. 1.

Fig. 2, on next page, represents the working parts of the larger instrument as seen from above, and Fig. 3 the working parts of the machine camera as seen from below.

Messrs. Greene and Evans provide a main shaft, which is actuated by a winch turned by hand. To this shaft are attached wheel work and counter shafts,

by which the whole apparatus is driven. The rotation of the shaft pays out the prepared film, and places it in position to receive the photographic impression, in which it is automatically exposed to the action of light. The light is then cut off, and the exposed film, which was motionless at the instant of exposure, is passed on, and wound on a receiving roller on the lower part of the machine. The pictures continue to be taken so long as the main shaft is rotated, and so long as any film remains to be paid out. The inventors wind a long roll on one of the spindles or countershafts, and this spindle is so arranged that as it rotates it pays out the film as fast as necessary. To

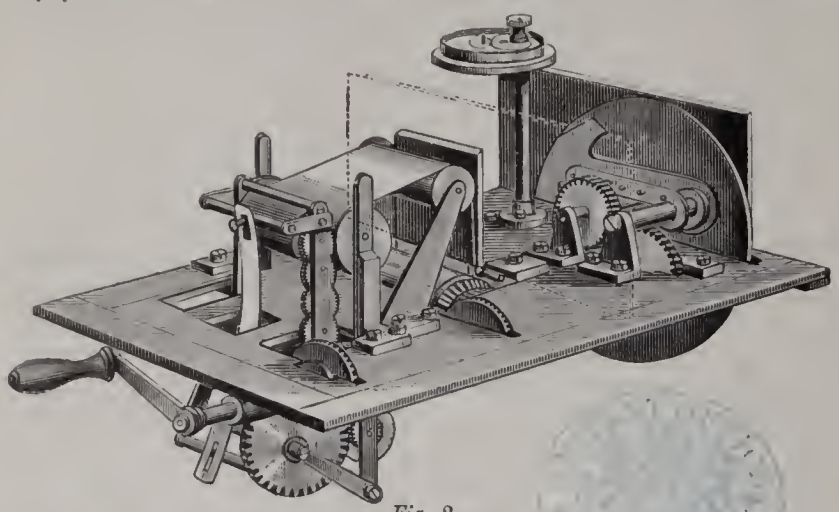


Fig. 2.

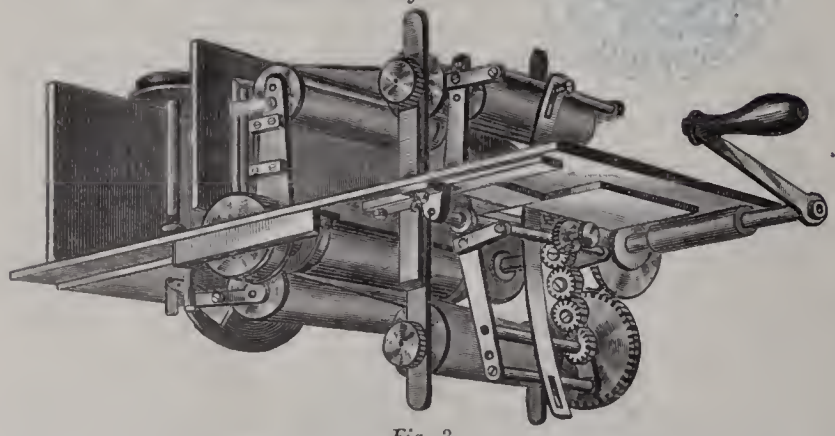


Fig. 3.

another spindle the free end of the film is attached, and by suitable arrangement the second countershaft is caused to rotate in a reversed direction, and to wind up the film.

Between the two rollers is arranged an exposure screen conveying the sensitive film to the rolling-up shaft, and when on this exposure screen, the film is subjected to the action of the uncovered lens.

As both the paying-out and rolling-up rollers have a continuous motion communicated to them by the driven shaft, and as it is desirous that the film, during its exposure to the light, should be at rest, an arrangement to effect this is provided as follows, and this is the cleverest part of the invention:—Immediately beyond the exposure screen, and between it and the up-winding roller, is an intermittently-acting drum of such diameter or circumference as that each turn thereof will take up and roll forward the exact amount of film required for each picture; in passing this film forward, the drum also draws into the exposure position a fresh length of film ready to be exposed. To effect this intermittent motion, the aforesaid drum has a single, long escapement tooth, which, when the drum is not in motion, rests on the cylindrical surface of a slotted pinion, which gears into, and is driven by, the main shaft with a continuous motion. The slot in this pinion is so arranged that once only during each revolution of the pinion does it allow the escape tooth to pass, and when this occurs, the drum, under the action of a driving spring, with which it is provided, makes one full turn, when the escapement tooth, coming round again, rests on the cylindrical portion of the slotted pinion as before. The spindle on which the drum revolves also gears into, and is driven with a uniform motion from, the main shaft, and to this shaft is attached the one end of a coiled spring, the other end of which is fixed to the inner circumference of the drum itself. As the spindle revolves, this spring winds up, and, on the release of the escape tooth and drum, the spring unwinds, carrying both the drum and escape tooth with it. Then the film is passed forward between the winding and unwinding rollers at this point only, with the necessary intermittent motion. The constant uniform motion of the paying out spindle as it unwinds, causes a certain uniform length of the film to pass forward towards the exposure screen, when it collects into a kind of loop in readiness for use. It cannot, however, pass into the position of actual exposure until that portion of the film occupying such position has been withdrawn. As soon, however, as the detent tooth attached to the drum escapes through the slot in the pinion, the drum makes a single revolution, and in so doing both removes the exposed film from the screen, and, at the same time, draws a loop of fresh film which has been gathering, into the exposed position, and, at the same time, passes forward the already exposed film into the form of another loop in readiness to be wound up on the winding roller. The latter is provided with a similar uniform continuous motion, from the main shaft in the paying out roller, and proceeds gradually to wind up the loop, so that the loop is wholly taken up by the time the escape tooth again rotates, when a fresh loop of film is passed forward.

The shutter for exposing the film to the action of light is made in two portions, each provided with an aperture or slot, which in one position only allows the light from the lens to pass, and it is only by this simultaneous action of these two shutters—that is, when

the apertures in each coincide at a given moment—that any action of light on the film can take place. One portion of this shutter is caused to revolve with a uniform motion as it is driven from the main shaft; the other portion is worked by a rocker, or slide, actuated by a cam; to this latter portion of the shutter is attached a spring, with a tension screw to regulate its speed of action. In this way the duration of exposure is rendered entirely independent of the speed of the driving shaft, because by the turning of this screw a somewhat longer or shorter exposure within limits can be ensured, whatever the number of exposures per minute may be. The moment the aperture in the revolving shutter comes into position with the lens, the cam lets the sliding shutter go, and by means of its attached spring the aperture in the sliding shutter also crosses, and the exposure is effected. The action of this shutter is so arranged that each exposure occurs simultaneously with the "at rest" position of the drum, escape tooth, and the film on the exposed screen.

Mr. Friese Greene thinks this machine camera to be likely to be useful for military purposes. For instance, several of them might be employed, driven by any suitable motive power, to automatically photograph the leading features of a battle. Some years ago he exhibited to the Photographic Society a little optical lantern which cast four pictures in succession upon the screen, and, before the one was quite removed, the next was superimposed; thus he showed the change of a countenance from grave to gay, and the very motions of the skin of the face could be seen, without the presence of any of the unpleasant "jerkiness" incidental to a series of pictures automatically projected by apparatus made on the old-fashioned principle. In Mr. Greene's lantern demonstration, colour gradually came into the moving face and into the dress, because he had washed different parts of the portrait on the slide with various "sympathetic inks," as they are called, consisting of suitable solutions of cobaltic and other salts. The heat of the lantern caused the colours to come out. Mr. Greene stated to the meeting that the lantern had been invented by an acquaintance of his in the west of England. By an improvement upon that lantern, now in course of manufacture, Mr. Greene hopes to be able to reproduce upon the screen, by means of photographs taken with his machine camera, street scenes full of life and motion; also to represent a man making a speech, with all the changes in his countenance, and, at the same time, to give the speech itself in the actual tones of the man's voice by means of a loud-speaking phonograph.

A CAMERA is, it is said, among the presents with which Miss Amy Fowler has left New York for Molokai; she has also received gifts of 2,200 dollars, a type-writer, piano, and music.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.—The executive have, we are informed, decided on holding in 1891 another large photographic exhibition. At their club rooms the exhibition of Mr. H. P. Robinson's pictures will close to-day. Over 1,200 visitors, it is said, have attended. The work of Mr. Harry Tolley will be the next feature at the Liverpool rooms.

THE ROYAL INSTITUTION.

VII.

DR. THOMAS YOUNG'S DISCOVERIES AND PHOTOGRAPHS.

ON the 24th of November, 1803, Young delivered the Bakerian lecture of the Royal Society, and in the memoir published in *The Philosophical Transactions* of 1804, he records how he photographed Newton's rings, so that he had his share in some of the photographic work which Wedgwood originated at the Royal Institution. The following are his own words on the subject, copied from the original printed memoir, for in this series of articles we are careful to deal only, wherever possible, with the oldest records extant, and not to quote at second-hand from books of later date; thus the chance of error is reduced to a minimum. He says:—

"The existence of solar rays accompanying light, more refrangible than the violet rays, was first ascertained by Mr. RITTER: but Dr. WOLLASTON made the same experiments a very short time afterwards, without having been informed of what had been done on the Continent. These rays appear to extend beyond the violet rays of the prismatic spectrum, through a space nearly equal to that which is occupied by the violet. In order to complete the comparison of their properties with those of visible light, I was desirous of examining the effect of their reflection from a thin plate of air, capable of producing the well-known rings of colours. For this purpose, I formed an image of the rings, by means of the solar microscope, with the apparatus which I have described in the Journals of the Royal Institution, and I threw this image on paper dipped in a solution of nitrate of silver, placed at the distance of about nine inches from the microscope. In the course of an hour, portions of three dark rings were very distinctly visible, much smaller than the brightest rings of the coloured image, and coinciding very nearly in their dimensions, with the rings of violet light that appeared upon the interposition of violet glass. I thought the dark rings were a little smaller than the violet rings, but the difference was not sufficiently great to be accurately ascertained; it might be as much as $\frac{1}{30}$ or $\frac{1}{40}$ of the diameters, but not greater. It is the less surprising that the difference should be so small, as the dimensions of the coloured rings do not by any means vary at the violet end of the spectrum, so rapidly as at the red end. For performing this experiment with very great accuracy, a heliostato would be necessary, since the motion of the sun causes a slight change in the place of the image; and leather, impregnated with the muriate of silver, would indicate the effect with greater delicacy. The experiment, however, in its present state, is sufficient to complete the analogy of the invisible with the visible rays, and to show that they are equally liable to the general law which is the principal subject of this Paper. If we had thermometers sufficiently delicate, it is probable that we might acquire, by similar means, information still more interesting, with respect to the rays of invisible heat discovered by Dr. HERSCHEL; but at present there is

great reason to doubt of the practicability of such an experiment."

In the first volume of *The Journals of the Royal Institution*, London, 1802, pp. 241-45, is Young's description of his arrangement for photographing Newton's rings by means of the solar microscope. Newton had observed that the colours are more vivid when a plate of a rarer medium is interposed between two denser mediums. Young thought the apparent difference to be due to the quantity of diffused light present, and, to remove this foreign light, he employed one glass in the form of a prism, and coated the lower surface of the other with black sealing-wax. The light reflected by the oblique surface of the first was thus thrown in another direction, and the reflection of the inferior surface of the second was so reduced that it could be disregarded. In fact, this device of Young's is the same in principle as that sold by opticians at the present day to produce Newton's rings.

The most perfectly plane glass Young could obtain was that used in Hadley's quadrants, one side of which he had ground, so that the plate became a thin wedge; the surface of the lens employed was a portion of a sphere of from five to ten feet radius. The glasses were thick, as they had to sustain considerable pressure, which was applied by means of three screws. For adjusting the glasses to the microscope, he fixed them in a cylinder, so that they could be easily turned "so as to reflect the light coming from the speculum into the direction of the axis of the microscope: it is obvious that in this case they must be somewhat inclined to the light, so that the focus of the whole image will never be equally perfect; and, instead of being circular like the rings themselves, their images on the screen will be oval."

In one of his experiments he placed a prism a few feet from the microscope, and cut off most of the image of the rings by means of a diaphragm with a central slit in it, whereby he was enabled on the screen to analyse the light of the different rings. Young said, as other Royal Institution lecturers have often said after him, that "the colours of thin plates, as seen by transmission, are also easily exhibited in the solar microscope; but since it is utterly impossible to exclude the very great proportion of the light which is not concerned in their formation, they never appear so brilliant as the colours seen by reflection."

Photography and Electioneering.—A daily paper says that, at a political meeting on Saturday last, the crowd gathered together "had more than verbal eloquence to speak to them, for, by the aid of a series of limelight pictures, the chief features of Balfourism in Ireland were illustrated. Mr. Harmer, of the Home Rule Union, gave graphic little descriptions of the scenes and incidents represented, and the whole lecture was a highly useful object lesson to the large number of electors present. The magic lantern ought to be requisitioned for the rest of the campaign. Judging by its stirring effect on Saturday it would prove a very powerful ally to the speeches of the coming week and more. Those who see it will remember that, though orators may be accused of exaggeration, a photograph does not lie."

AN OLD PHOTOGRAPH BOOK.

Only an old photograph book, found in the dusty lumber closet of an old country cottage, when the death of the farmer tenant has suddenly introduced strange faces into the old home, and necessitated an examination of the property of which the deceased in legal language stood possessed. The deceased stands no longer; he lies now in the village churchyard, possessing nothing, but among sundry articles which erst belonged to him, is found, with his name carefully and laboriously written in a vignette, on the title page, an old photograph book. Let us look at it before it is cast aside as rubbish. For who can tell with what solicitude this book was once preserved? May it not contain the portraits of his parents, his wife in the days when she was his sweetheart, the young woman he kept company with, the one woman in all the world for him; her portrait and the portrait of her children? Of Homer's heroes we know nothing but the name, either of Trojans or well-greaved Greeks, of Antilochus or Ablerus, of Leitus or Phylacus, of Enrypylus or Melanthius, of Polypœtes or Astyalus, of Teucer or the divine Aretaon. The sixth book of the Iliad gives the names of these combatants and of many others—the names and nothing more, save the distinction between the conqueror and the conquered, the slayer and the slain. It is all one in some of our most important Biblical genealogies; we know that Matthew records that Eliakim begat Azor, and Azor begat Sadoc, and Sadoc begat Achim, and Achim begat Eliud; but how little do we know of Elind, or of Achim, or of their progenitors?

Our old photograph book can do more for us than the great Epic poet or the Evangelist. Therein, as in a Nigaristan, or silent Valhalla, we see in their habits, as they lived, the family and the friends, humble folk, the common delf of human kind, which, so many years ago, made merry or mourned with them on summer afternoons and in the winter fire-light in the old and now deserted cottage home.

Photography, like the grave, has, in one respect, made the poor and the rich equal. Formerly, it was only the wealthy who could hand down conventional presentments of themselves to their descendants. The labours of Gainsborough and Reynolds, and of many succeeding portrait painters and miniaturists, demanded a hire far beyond the capacity of the poor little purses of the poor. Nor has the present, in this respect only, an advantage over the past. Phœbus is an artist who cannot flatter.

But all this is by way of preface to our book—our old book of photographs. It is of the common almost cubical shape, with the embossed leather covers, and the metal clasps long ago oxidised into a rusty green.

A pleasing feature in this old photograph book, which is observable also in other books of the same nature, is the subordination of the private to the public, of love to loyalty, of the ties of kindred to the exigencies of caste. The first portrait we meet is that of Her Most Gracious Majesty. She looks, however, neither happy nor glorious; the carte, like most of those in the book, is considerably faded, and suggests a suspicion of a reproduction from a positive, a branch of dishonest piracy. Next after Her Majesty follows in stereotyped and toast-like succession the photograph of the Prince and Princess of Wales. This was evidently taken just after their marriage, when they were both young and fresh in this grey world. The picture of their life's spring is presented to us by *Ghémar*

Frères, Photographes du Roi, Bruxelles. The Prince has a slim appearance, with an abundance of curly locks. The Princess wears her hair in a net, and is encased in a crinoline which occupies fully one half of the carte. She leans on the Prince in what is doubtless intended to represent an affectionate attitude, with her hands lightly touching his omoplates, but the impression produced on the non-artistic eye is that she is taking his measure for a coat, and observing with interest the narrowness of his shoulders. After these portraits, succeed in due order portraits we may suppose of the rustic family, and portraits of their friends. But all of them suffer from the same disability. Whether from rural nervousness, or a determination to follow the prevailing fashion, they are, without exception, unable to stand alone. One lady, to save herself apparently from falling, clasps spasmodically, and with both hands, as a drowning man is proverbially supposed to clutch at a straw, the back of an antique, elaborately carved chair, such a chair as we might hope to meet in an old baronial hall, but would certainly never expect to find in a country cottage. Another lady of more mature age, and therefore, perhaps, of a more sedate and pious turn of mind, rests one hand on a portion of what appears to be a sepulchral monument, or the construction of a tomb, lacking, indeed, nothing but the usual "Here lies," to complete the resemblance. Several gentlemen who have evidently doffed the rustic blouse and assumed their suit of Sunday black for the occasion, place a weather-beaten hand, accustomed to drive the plough, on a portion—usually supported by one leg—of a chiffonier or bureau, which exhibits such exquisite wood carving as reminds us of the work of Grinling Gibbons, to be seen at Chatsworth and St. Paul's. Ladies and gentlemen alike, who, even with the assistance above mentioned, are yet wholly unable to maintain that erect position which is supposed to be the privilege of humanity, are represented seated, usually with a table on which a vase of flowers is commonly placed by their side. If the sitter be a gentleman, the table not infrequently supports his hat, which he is, apparently—like the nervous member of a club, who will not make use of the hat-stand in that case made and provided—extremely anxious should not for a moment be out of his sight. The old photographic chair is rarely of the ordinary pattern; it is either of the ancient, high-backed, intricately turned style, or of that style which is termed rustic, and supposed to be suitable to a country landscape. The sitter is evidently uncomfortable in it, but his discomfort we may hope is mitigated by the elegance of his surroundings. In the background on one side of him is a marble column; on the other, a curtain of deftly-worked tapestry. Through a window appears a view of gardens, such as might have belonged to the chatean of a French marquis. What can a man desire more?

All these portraits of rustic men and maidens have precedence over such distinguished statesmen and humanitarians as Lord Derby and Mrs. Fry, who follow mixed up with such unlikely companions in real life as Agnes Willoughby and Tom Sayers. This confusion of persons in our old photograph book reminds us of that democratic disregard of rank, that supreme negligence of order of any kind, which prevails in our National Portrait Gallery (free) of the present day—the stationer's shop window—where gaping crowds are delighted at one view with such discordant elements of the social fabric as Nellie Farren and Lord Napier, Sandow and Damiens, the Duc d'Orleans and Lilley Langtry, Mr. Chamberlain and Miss Letty Lind, and the Bishop of Manchester and Miss Mabel Love. Our old photograph book concludes with such accidental varieties—comets in this system, padding in this magazine—as a fat baby, with "ketchy-wetchy," or some other infantile language, probably alone intelligible to the mother and the monthly nurse, printed beneath it; one or two landscapes of moor and fell; a display of architecture (most likely the village high street); two dwarfs, male and female, propped up by two chairs, the former holding a hat which, from its undue prominence, is big enough to cover much more than his head; and on the last two pages, two Welshwomen, each with her conical and hideous head gear, each with her coloured apron, and each with her particular umbrella.

More than a quarter of a century ago, Schubert, a painter of Berlin, laid down some rules for posture in taking portraits. Of these, more than one rule survives still. For example, the rule which, embodied in the form of a direction, was once almost invariably heard by the person who wished a portrait taken as soon as the camera was suitably adjusted. "Let," we may suppose the photographer saying to the originals of the portraits in our old photograph book, "let your position be easy and unconstrained"—and here was the rub, or the beginning thereof. They tried, doubtless, their best to throw themselves into a careless *degagé* attitude, but their efforts were not crowned with success. "Oh, dear me!" we can imagine the artist saying, "this will never do; your feet are too forward; your hands are not sufficiently drawn back. This hand," he takes it with all due delicacy, "should rest on the side table thus, clasping this book thus;" he suits his action to his word, introducing the hand to the well-worn volume, and steps back the ligitimate number of paces to watch the effect. "No," he says with a puzzled expression, having arranged the matter, as he conceives, satisfactorily; "no, this won't do! The thumb should be shown in the foreground, and the fingers should be bent more inwards; yes, and you must show more of the back of your hand." They conscientiously endeavoured—this rustic company—to follow out, so far as they understood them, these varied directions, not without some danger of a sprained muscle, owing to such unusual contortions, and achieved finally, after effort, what they hoped was a successful result. But they were doomed to disappointment. "No," says the photographer, "no," adding with a vexed air, "Didn't I begin by suggesting to you that your position should be easy and unconstrained? and," as one of the martyr band glances at the professional behind his apparatus, "pray don't look at the camera" (or, as he probably called it, the apparatus); "it will tend to impart to your face an expression in the highest degree dolorous and dissatisfied." The martyr thinks at once how well such a photograph would express his feelings, but is unwilling to follow the example of Oliver Cromwell, who charged young Lely to paint him as he was, with all his pimples, warts, protuberances, and other deformities, and, failing this, threatened not to pay him for his picture a single farthing, and so directs his wearied glance to the door, perhaps thinking in this evil moment of suddenly making his escape. "That is quite right," murmurs the photographer; "the position of the eyes is excellent, and now please call up a 'pleasant' look."

Alas! this "pleasant" look and this "easy and un-

constrained" position—seemingly so simple, practically so difficult. A few only, a very few, of these old portraits have successfully managed both. The pleasant look has lapsed far too often into a fatuous simper, or, in cases where we may suppose the sitter's patience has been supremely tried, into a stern scowl of Spartan endurance, or even a truculent expression of internecine hatred; the easy and unconstrained position has become so strange and forced an attitude that it communicates a feeling of discomfort even to the casual spectator, and makes him wish that the hands especially had been hidden in the sitter's pockets, or anywhere out of the picture, instead of being ruthlessly brought to the front by that favourite old photographic expedient of a book, a table, or a high-backed chair.

Literary Notice.

SUN ARTISTS, No. II. (*Kegan Paul, Trench, and Co., London.*)

THE second number of this excellent quarterly periodical—just published, although dated January—contains some good photo-mechanical reproductions of four of Mr. H. P. Robinson's photographs, namely, "Carolling," "A Merry Tale," "Dawn and Sunset," and "When the Day's Work is Done." It also contains an article by Mr. Andrew Pringle upon Mr. H. P. Robinson and his works. Mr. Pringle says: "Mr. Robinson was born in 1830 at the pretty little town of Ludlow, in Shropshire. Art seems to have claimed him for her own at a very early period of his life, for he 'cannot remember the time when he was not drawing.'" He also says: "The greatest service that Mr. Robinson has rendered to photography has been, in our opinion, his bringing under our notice, in an orderly and categorical way, many of the principles which guide artists in their work. It is hopeless to argue that art has no rules."

Last week a newspaper adversely criticised the prints issued in this number of *Sun Artists*, and expressed the opinion that Mr. Robinson would not like them. He has, however, written a letter expressing his thorough approval of them.

Mr. W. Arthur Boord is the honorary editor of *Sun Artists*, and the periodical is a credit both to him and the printers and publishers.

THE PHOTOGRAPHIC SOCIETY.—*The Manchester Courier* of February 13th published the following paragraph about the recent dinner of the Photographic Society, written by its London correspondent, who was among the guests:—"The Photographic Society of Great Britain has celebrated its annual dinner at the Café Royal, Regent Street, under the chairmanship of its President, Mr. James Glaisher, F.R.S., and was remarkable for the varied races and conditions of men, and of the regions of the earth which it represented. Persons from nearly every quarter of the globe met together on the common ground of devotion to the science and art of photography. On the chairman's right hand, for instance, sat Mr. Chang, of the Chinese Embassy, a member of nearly all the photographic societies in London, and whose speciality is the production of pictures by magnesium flash-light. On Mr. Chang's right hand, again, sat Mr. Leon Warnerke, a Russian artist, founder of the Photographic Societies of Moscow and St. Petersburg, in which latter capital he inaugurated the first photographic exhibition. This was visited by the Emperor and his family, and won for its promoter the Order of St. Stanislas."

AN INSTITUTE OF PHOTOGRAPHY.*

BY G. LINDSAY JOHNSON, M.A., M.B., B.SC., F.R.C.S.

SOME months ago a notable sale of photographic relics in connection with Daguerre, Talbot, and other fathers of photography, was announced to take place. When I heard of it, I wrote a letter to the Society urging them to do what they could to collect sufficient money to purchase the collection for the Society. Many of the members sent cheques, but notwithstanding, the scheme fell through, and the collection was distributed, a portion going to the Museum at Bath. Now, as we are told to-night that the Society is likely to be turned out from its present home, the future will have to be discussed.

As far as I can see at present the position is this:—A museum and collection of photographic materials and views is a scheme which has been received with more or less approval by the Society. To attain this object three ways appear open: either to get a permanent building, or at least a suite of rooms of our own to arrange them in, or we must place ourselves in the hands of the Directors of the South Kensington Museum, or the Imperial Institute. This latter scheme would certainly be financially the easiest, as I am (unofficially) informed the Government would probably be disposed to grant a suite of rooms to the Society in return for equivalent benefits on our side. On the other hand, Kensington is too far from the majority of the members to be altogether desirable. The Institute would not be finished for eighteen months or more. A more central place near Charing Cross would doubtless meet the views of the majority; but the scheme that would comprise a building in the City must fall through unless we can gain the support of the City magnates. Before February I hope to have sufficiently sounded several influential City men to be able to form an idea how far they would lend their aid.

The third and last way would be to endeavour to come to some arrangement with an Institute like the School of Mines or Society of Arts; but here again the question arises (apart from the feasibility of the scheme, which is also open to question) whether the sacrifice of individuality is not too high a price to pay for the benefits to be gained. It is clear the Government will only help us just as far as it can see an *immediate* advantage or return for so doing. It is also clear that anything in the nature of a permanent collection can only be obtained when we have already a place of our own to arrange it in.

Now, a building suitable for the purpose would cost far more money than the resources of the Society can hope to reach, even if we abandon the scheme I proposed to you of having an institution where the higher branches of art photography can be taught and practised, as well as original researches conducted.

How are we to get these necessary funds, for I consider, at a rough guess, that at least £10,000 or £15,000 would be required for the mere building, apart from the ground value? It seems to me the only practical way will be to try to convince the leading men in the City that the Institute and Society will be of permanent value to the City of London. Considering the fact that almost every branch of art and science is enriched by the aid of photography, and that newspapers, books, and literature gene-

* A paper read before the Photographic Society, and entitled by its author, "A Scheme for the Formation and Establishment of a Central Institute of Photography in Connection with the Photographic Society of Great Britain."

rally, not to speak of calico printing and pottery, is becoming daily more and more dependent on it, it may be possible to receive much of the support we want from this source. Much has been done in other directions to encourage us. There is the proposed Battersea Polytechnic, under the management of Mr. Spicer and his colleagues. Here the public has supplied more than £150,000 demanded by the Charity Commissioners as a condition of their providing a like sum. The Goldsmiths' Company are providing a magnificent building at their own expense. There are besides the People's Palace, the Birkbeck Institution, the Regent Street Polytechnic, and the Guilds' Institute in Finsbury. This shows that the public are not averse to giving their support to such objects.

I, for one, would like to see the Society raised from the position of a mere debating club, relieved by an annual soirée and exhibition, to a permanent institution like the Society of Arts, where not only could the trophies of our art be exhibited to an admiring public, but where daily instruction in every department of photography, including the mechanical processes, could be given under suitable instructors, and where, moreover, as in the Royal Institution, a complete laboratory could be at the disposal of members who were desirous of pursuing original research.

I am aware that such a scheme borders on the visionary, but something is surely needed to supply the wants of a properly organised Photographic Technical Institute. Both France and Germany have had them for some years. We, as usual, are behindhand. I admit that in neither country is the institute a part of a photographic society, and I see no reason why it should not be connected with it.

If people, in reply, say we have no need for it, or such a scheme is without precedent, I could at once point to the "Apothecaries' Hall," to the building of the Pharmaceutical Society, to the School of Mines, or, to give a better example, the Royal College of Surgeons, which, on a large scale, comprises everything that I ask for—classes, lectures, practical instruction, reading room, laboratory, museum, and meetings. As in a Law Court when suing a company for damages, it is perhaps better to ask for too much than too little, and although the scheme may evaporate down to a smaller nucleus by asking for too much, I do not think we shall get too little. If the scheme is too premature to be appreciated by the general public at present—although I think you will agree with me it is more practical than, say, the Channel Tunnel—we may be assured of one thing, that photography is progressing by such leaps and bounds that a scheme which appears preposterous now will, in a few years, become a necessity, and by our taking the chief rôle on the stage we may hope to claim the privilege of leading the way.

I can only hope the Council will be induced to take the matter up, and not to give up working until we have succeeded in establishing an institution which shall be a model to other countries. With regard to this matter, I have been at some trouble to try to feel the pulse of the public. I have seen several members of the County Council, the Common Council, and I have also interviewed several prominent men in the City of London, and with scarcely an exception I have had a most favourable and encouraging ear lent to me, and have received promises from several that, if they saw that others would fall in with the idea, they themselves would be only too willing to help. If we find it impossible to accomplish the above scheme, I do not think it altogether impossible to procure a flat in some accessible part of the city which should comprise at least one large room which could be used for exhibition purposes, soirées, and the like, and the results of our art could be shown, and two smaller rooms, one of which could be used as a library and tea room, a committee room, and a cloak room. A double room attached would naturally be a great convenience.

I may add that there are some suitable buildings and flats to be seen about Shaftesbury Avenue, which the Committee might deem it worth their while to enquire into. There is no doubt, in my opinion, that a permanent building would greatly raise the character of the Society in the eyes of the public, and, in consequence, raise its income.

From Royalty downwards the public have always a great weakness for photographs and photogravures, and even if the support of the City Guilds so fell to the ground, I cannot help thinking that an energetic appeal to the public coming from the Council and members of the Photographic Society, and backed up by the Press, who are depending more and more every day upon photography to illustrate their sheets, would answer, for we have only to compare the number of illustrations obtained by means of photography in the daily papers, with the occasional illustrations which now and then, as a kind of phenomenon, appeared in journals as a wonderful exhibition.

Illustrations are becoming a *sine quâ non* if a book nowadays is to sell at all; the knowledge of that fact cannot fail to have influence with the public. But if the public are sufficiently interested to prefer inferior papers only illustrated with miserable daubs, who can doubt that a permanent gallery adorned with the choicest works of art drawn from all parts of the civilised world, will not fail to cause a continual attraction to the public?

This is not the time to enter into details. My object is to see whether it would not be possible for us to pass some resolution in furtherance of the purpose in view. I might say I have been making enquiries with regard to the Imperial Institute in South Kensington, and have spoken to Sir Henry Roscoe and several other prominent gentlemen in connection with the Institute, and I have been assured by them that it is not improbable, if the council were to meet certain members of the Government, assistance might be received in connection with South Kensington. A member of the Common Council, who is very enthusiastic on the idea of a central institute in London, told me that he thought if we got a sketch plan of the building, such as would be suitable, and brought it to the Common Council, together with an estimate of the cost, that it would be favourably considered, and possibly the money might be forthcoming. Another gentleman suggested that we might have a building or a portion of a building in London, where we might have a sort of gallery of photographs and photographic materials drawn from all sources, and to which we might invite photographers to send works which had gained prizes, for exhibition on the walls. There is also a possibility that we might get a loan exhibition from the works at South Kensington placed upon the walls. Thus, while we have the exhibition here, we might have the technical part going on at South Kensington. But whatever decision is come to, it must be arrived at speedily, because our lease has run out, and we shall be without a place of meeting at all. Therefore, I would ask whether it would not be wise to raise a little enthusiasm in the public mind, and get some money together so as to procure a room which we might call our own, and where we could do

what we like. We find that various technical institutes are growing up like mushrooms in and around London; and we ought to do our best to bring forward some practical scheme which would benefit the Society and photography generally.

A PRINTING MACHINE OF THE FUTURE.

TO-DAY we give the first precise public description of a machine camera, rumours about which have interested photographers on both sides of the Atlantic for some months. Our idea is, that the chief value of the machine, or of a modification thereof, may hereafter be found to be in a direction not contemplated by the inventors—at least, they have said nothing to us on the point—namely, in the printing of positives for book illustration, and as another step beyond that taken by Mr. Urie, in the direction of printing newspapers by photography. Years ago, by a kind of prophetic instinct, one of the greatest inventors of daily newspaper printing machines, opined that perhaps photography would hereafter be the successful competitor in such work.

The machine of Messrs. Greene and Evans, depicted in another column, will take from five to ten or even more impressions in a second, according to the rapidity with which the handle is turned, and Mr. Greene says that one can be made to give a large additional number of exposures if necessary. In positive printing through a negative, the amount of light can be made to vastly exceed that present in the photographing of street views, so the limit to speed, especially with improved machines as yet unborn, is at present beyond calculation.

One can imagine the possibility of a practically endless band of paper being covered with some sensitive preparation as it unrolls, then passing on to the exposure platform, and afterwards into developing and fixing baths.

At the present speed, exposing a negative on a travelling band three thousand times in five minutes would not be bad work.

PLATINUM AND PALLADIUM TONING.*

BY FRANK P. PERKINS, F.I.C.

I HAVE observed that it is sufficient to add to a slightly acidulated solution of platinic chloride a fragment of sodium sulphite, and then brush the liquid over a well-washed silver print produced on plain salted paper, for the silver to be almost immediately displaced by platinum. This is a simple method of "toning" for such as have not the ready-formed platinous salt at hand.

I have also noticed that a slightly acidulated solution of palladious chloride may be used in the same way, and with similar results.

LANTERN CLUB.—A meeting of those interested in the formation of a lantern society was held at St. James's Hall, Upper Regent Saloon, on Thursday the 20th, when it was decided to form such a society, and it was resolved that it should be known as "The Lantern Society." The Hon. Slingsby Bethell, of Chelsea Lodge, Chelsea Embankment, was elected Provisional Chairman, and Mr. T. H. Holding, 46, Chesilton Road, Munster Park, S.W., as Secretary *pro. tem.*, together with a committee—to frame rules—consisting of Messrs. E. R. Shipton, A. Mackie, G. R. Croswell, Lieut. C. E. Gladstone, R.N., Mr. A. R. Shophee, together with the chairman and secretary.

* This brief article from *The Chemical News* contains information likely to be of considerable use in photography, as we know from past experiments.—ED.

THE HINGES OF DARK-SLIDE SHUTTERS.*

BY CHAPMAN JONES, F.I.C., F.C.S.

THE deleterious effect of the hinges of the shutters of dark slides has often been observed, the results varying considerably, and showing sometimes as fogging on development, and sometimes as a loss of sensitiveness. But I have not known until lately of a large increase of sensitiveness produced in this way. The dark slide in this instance was bought second-hand; it had leather hinges to its shutters, the effect of which was rapid enough to give a well-marked fog across plates that remained in the slide for a few days. It was sent to Messrs. Watson and Sons to be cured of the defect, and they replaced the leather by the material they have specially made for this purpose. After a few weeks, during which the back appeared to behave in a thoroughly satisfactory manner, it was left with plates in it for about four months, and on a dark December afternoon they were used for making an enlargement, and, as afterwards proved, considerably under-exposed. One plate was developed with pyro and sodium carbonate, and the other with eikonogen, and in both cases that part of the plate that had been opposite the hinge appeared as if it had received two or three times as much exposure as the rest of the plate, but with no tendency to fog, even on forcing the development. The plates were about two years old when exposed.

On mentioning the matter to Messrs. Watson and Sons, they were good enough to give me all the information they had. They say, that having found leather not always reliable for the hinges of dark slides, they "came to the conclusion that some kinds of leather were dressed with ammonia, and that when this was the case the chemical was never thoroughly got out of it, and, therefore, when the leather was used, it fogged the plate in the portion that came immediately underneath it." They continue, "We then gave up using leather altogether, and substituted for it a species of jean, which we have specially made for us, exceedingly thick and strong, and since we have used this we have had a total absence of complaints. When we altered your slide we merely took away the old hinges and replaced them by our new material."

As I happened to have a plate that had been in a back of Watson's make with hinges as described for about two years, the plate itself about three years old, I tested it by exposure and development, and found no sign of any irregularity.

It is not impossible that the increase of sensitiveness now shown is apparent only, and due to a loss of sensitiveness of the plate except where the hinges are; but judging from the exposures given, the result on another plate exposed at the same time, and the behaviour of the back before the hinges were changed, I do not think this is probable.

WHITE DRAPERY.—The weak or diluted developer, with less pyro, is the only one I have ever been successful with in white drapery. Try the slow developer once, and I feel sure you will never use any other. It does not pay to be in a hurry in developing; leave it until evening, when there is no danger of being disturbed, then go slow.—*W. B. Glines.*

A PHOTOGRAPHIC SOCIETY FOR EXETER.—A meeting to inaugurate the above will be held at the New London Hotel, Exeter, on Thursday, at 8 o'clock. Any information respecting the proposed Society may be obtained of Rev. John Sparshott, Fairfield House, Alphington Road; or Mr. Ernest F. C. Damant, 32, Longbrook Street.

* A paper read before the Photographic Society.

DETECTIVE CAMERAS.

BY C. BRANGWIN BARNES.

DURING the last two years there has been a continual advertisement of so-called hand and detective cameras. Each camera maker and dealer in photographic requisites has been competing with the others as to which should bring out the best. They have appeared in all shapes and sizes, from the book camera, taking plates about 1½ inches square, to the larger box or parcel camera, taking quarter and half plates. Amongst the varying shapes may be mentioned the brown paper parcel, the leather portmanteau, and the camera which is concealed under the waistcoat or in a hat.

That there must be a considerable demand for these articles goes without saying, but I fancy that the buyer usually belongs to the amateur ranks. Most things that are made and sold have a use, and perhaps the detective camera has one; but I must confess that, so far as I have seen, I have been unable to discover it. The great difficulty seems to me to be that of obtaining a sharp negative. If the camera is held in the hand it is very rarely that an exposure can be made without moving the instrument, and with the buttonhole apparatus the very motion of the chest caused by breathing is sufficient to give a blurred image, to say nothing of the necessary pull at the cord that releases the shutter. I am myself the happy possessor of one of the latter description, but it came to me in the shape of a prize in a literary competition, for I certainly should never have bought one. A cheap detective camera of the buttonhole class has recently been introduced, and in the advertisement recording its various and manifold merits the following passage occurs:—"Can be used on the promenade, in *law courts, churches, and railway carriages, also in breach of promise and divorce cases*—in fact, at *all awkward moments* when least expected. The artful maiden, the wily detective, the wronged wife, will now be collecting evidence. The bad boy will levy blackmail upon his sisters by illustrating family squabbles instead of angelic sweetness, *and happiness will be within the reach of all.*"

Now every photographer of any experience must be aware that this is mostly "high falutin," as "law courts and churches" are not usually such abodes of light as to render the production of a shutter negative a possibility, although the advertisement goes on to inform us that "every negative is a perfect gem," and I must confess to being somewhat cynical as to the universal happiness which is to be effected by the means of the detective camera when used for the purpose of levying blackmail by the bad boy of the family. We are further informed that the camera "works the same in fog or rain," that "no movement is too quick for it—the racehorse at greatest speed, the flight of birds, or the lightning flash itself."

The Paul Pry character of the detective camera is, in my opinion, one of its greatest drawbacks, although we are well aware that we must take a grain—nay, a whole drachm—of salt with most of the wondrous tales that are told as to what has been done. In the hands of a true gentleman or lady the camera would not be out of place, but I certainly object to it in the possession of the "artful maiden" or the "bad boy." Seriously speaking, I fancy that the hand camera can be made of far more utility if stood down for exposure. A parcel would attract no more attention if placed on a window-sill, or any convenient resting place, for a moment or so, than it would in the hand, and it would certainly give the operator a much better chance of obtaining a fair result. The main advantage of the detective camera lies in the fact of its having a fixed focus, as it enables one to transfer to the photographic plate many things that he would never get the chance of doing if he had to set up an ordinary camera and go through the operations of focussing and exchanging the focussing screen for the dark slide. This renders it especially suitable for animal photography, and during the coming summer I hope to obtain some pictures of deer and cattle by its means.

For indoor work, the small lens puts one at a disadvantage, unless a time exposure can be given, and that of course does away with the secrecy of the business. On the whole, I do not think that the introduction is an unmixed advantage. The sporting papers have lately been printing much about photographing the finishes of races, but the time which would have to necessarily be wasted in developing operations would undoubtedly prevent the camera ever taking the place of the judge's eye in deciding which horse was the winner, added to which it would be very unpleasant for the judge to give a verdict in favour of one horse, and the plate, when developed, to reverse it. The usual run of detective cameras would be far too small for this class of work, as the negatives would have to be enlarged, especially in the case of a very close finish. One paper goes so far as to state that, in its opinion, there never was a genuine *dead-heat* run yet, and that if a photograph had been taken of, say, the Derby finish between Harvester and St. Gatien, the owner of one of the pair would have taken all the stakes instead of half. If some enterprising experimentalist can discover a method of taking a photograph which can be shown immediately, a nice little fortune awaits him on the race course; but until that desirable consummation is arrived at, I am afraid Judge Robinson will not be deprived of his berth by the detective or any other camera.

WARMING SOLUTIONS. – Some professionals as well as amateurs are troubled at this time of the year to obtain sufficient density in their negatives, and it is owing to the coldness of the solutions, plates and pans, which they may not think of as the cause. By warming them this difficulty is overcome. A dark room and all its contents should be constantly kept at an even and warm temperature. Mr. S. Wing says that he remembers a season of unusual success in getting fine results, in a room where a chimney passed up directly through his darkroom, and his silver bath was placed close to this chimney, which was uniformly warm all through the cold weather. Better work he never performed, and he gives the chimney due credit for its valuable assistance.—*Boston Photographic Review.*

EDMOND V. BOISSONAS.—*Anthony's Photographic Bulletin* records the death of this photographer on January 25th, of typhoid fever, after a short illness, and at the early age of twenty-seven and a-half years. Mr. Cramer, with whom the deceased had been associated since last spring, says of him: "He was a young man of remarkable talent, rare abilities, and a highly honourable character—a worthy son of his father, who gave the name Boissonas a world-spread reputation amongst photographers. His sudden death will be one more great bereavement to his family, and particularly to his aged mother, the father having died one year ago." "His greatest achievements," says the *Bulletin*, "were in the line of orthochromatic photography; and we have in our possession a fine series of pictures illustrating this interesting branch of our art, that we shall treasure now more highly since he who gave them will never more be able to give us such evidences of his genius and skill."

Notes.

The latest use of photography in medical science is seen in a new medical publication. The author of a paper on the peptones made some experiments as to the power of various pepsins in digesting albumen, and, desirous of showing his readers the results, he had the flasks in which the experiments were made photographed, and the photographs reproduced for publication. The pictures show the exact relation and proportion of the various residues, and lay the experiments before the mind in a very vivid way. The idea is a capital one, and is capable of much expansion.

The *Queen* observes that there is no reason why a lady should not establish a photographic studio in the ordinary way of business. At present ladies are more frequently employed as touchers up than as operators. For touching up, fifteen to twenty-five shillings per week is an average payment, says our contemporary, and for specially good work thirty to sixty weekly may be earned. These prices are probably correct, though we doubt if the cases of ladies earning as much as three pounds a week are sufficiently numerous to encourage any one to take up this vocation in the expectation of obtaining this sum. The *Queen* recommends any lady desiring to join the photographic profession to enter one of the large photographic firms as a pupil or an apprentice, as it would be quite worth while to pay a high premium to obtain the requisite training, and it would be wiser to pay £100 for entrance into a first rate firm than £30 to a less successful one. The *Queen* has rather high notions; we know plenty of first rate photographers who would be glad to initiate any lady into the mysteries of photography from the beginning to the end for a much less sum than £100.

The most original application of luminous paint is that described and illustrated in the *Scientific American*. The illustration represents an escutcheon for keyholes, designed to be especially convenient on closets and chests in dark places. The escutcheon is formed with glass, and has a concave or recessed back, to which is applied a coat of phosphorescent paint, and this paint is covered with a coat of cheaper or ordinary paint. The escutcheon may be carried by an ornamental metal or other plate secured to the door or other surface in the ordinary way, the shape of the escutcheon protecting the phosphorescent paint. One obvious use of the luminous keyhole the inventor discreetly omits to mention. It would occur to everybody. A luminous keyhole on a street door would certainly be an enormous boon to members of festive clubs, Freemasons' lodges, and the like. The only drawback is that the luminous keyhole would too publicly advertise the propensities of the householder. Of course all invidious reflections would be done away with if every house had a luminous keyhole, but this is too much to hope for.

Photography is the source of a very comfortable income to those privileged persons who, by long usage, acquire a sort of vested interest in "show places." From St. Lawrence in the Isle of Wight, the smallest church in England, to York Minster, every ancient building of importance furnishes work for the photographer. Photographs, indeed, enjoy a relation to sacred edifices accorded to nothing else, as there are few vergers who have not a bundle of photographs of the cathedral to which they are attached about them, and these they do not mind selling within the building itself. We see no particular harm in this, but the vergers would probably be horrified if they were asked to sell anything else. The lowest depth of this kind of thing seems to have been reached in Scotland, where the Burns' Mausoleum has been let to a grave-digger as a shop for the sale of curiosities. The tenant pays a small rent, and disposes of photographs and books over the poet's ashes. This does not look much like reverence.

A capital use has been found for the series of photographs which the firm of Braun and Co. took of the principal pictures in the National Gallery some two or three years ago. Last week Dr. J. G. Fitch delivered a lecture at the Working Men's College on the National Gallery, and provided himself with a series of the photographs just named, which were placed on a stand in view of the audience in the order mentioned by the lecturer, and when required to illustrate his remarks. A further development of this plan of art instruction might be made by exhibiting lantern slides of the pictures. Though Braun's photographs are of a fairly large size, they could not have been seen to advantage by any of the audience save those seated on the front benches. An image on the screen is of course visible all over the room.

Advertisers are always sighing for new worlds to conquer. Perhaps the tallest notion yet put forward is that of constructing an optical lantern of sufficient capacity to throw an image on the clouds. The inventor proposes to use photographic lantern slides of such objects as "You dirty boy!" of Pears' soap fame, and similar subjects. No doubt the project would be a splendid one from an advertising point of view, but we have strong doubts as to its feasibility. Nor does the projector of the plan help us; he fails to tell the world whether he has constructed the necessary apparatus. When this is accomplished, discussion will be possible.

At a meeting of the Chemical Society, a point interesting to photographers was raised by Mr. W. Thorpe, who remarked that people were very apt to think that uncoloured glass was permanent, yet probably most of the members had seen specimens which had begun their existence colourless, yet had before long acquired an appreciable colour. This is a common experience in photographic studios, but is one which is apt to be overlooked.

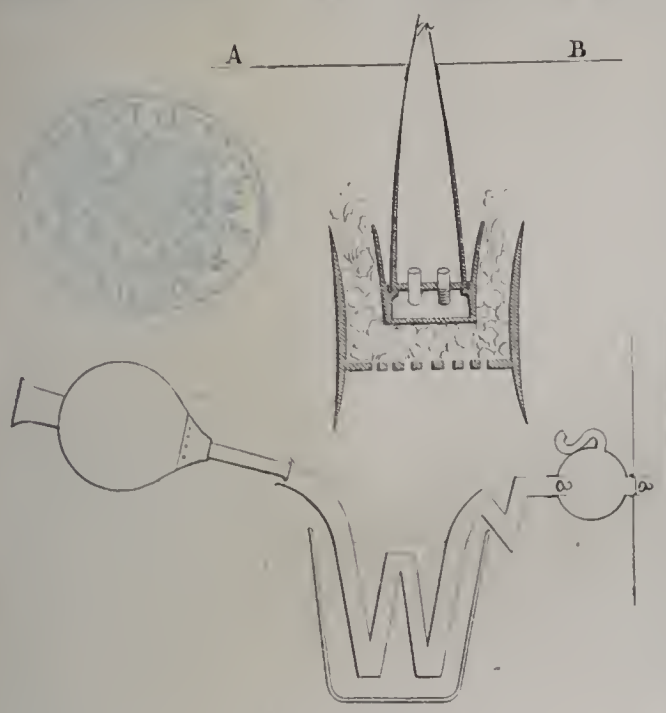
THOMAS WEDGWOOD'S EXPERIMENTS ON LIGHT.

In the series of Royal Institution articles in these pages, one of Thomas Wedgwood's memoirs on "Light," read before the Royal Society, was introduced. The second and last is appended hereto, to assist in the completion of our summary of the life and works of the first English photographer.

XIII.—*Continuation of a Paper on the Production of Light and Heat from different Bodies.**

Experiment 1.

In order to discover what effect the light of the burning fuel has upon incombustible bodies, I fixed into the end of a tube of earthenware† two equal cylinders of silver, with polished surfaces, half-an-inch in length, and a quarter of an inch in diameter (see figure 1‡); one of the cylinders was painted



Figs. 1 *and* 2.

over, except the tube, with a thin coat of incombustible black colour, to make it *absorb* the incident light; the other, intended to *reflect*, was left with its polished surface. Applying my eye to the opposite extremity of the tube (which it fitted exactly, so that no extraneous light could enter), and directing it towards the two polished ends of the cylinders, I held the tube within a red hot crucible, surrounded by burning coaks, and continually turned it round, that both cylinders might be equally exposed to the light and heat. The result was, that the end of the blackened cylinder began to shine a considerable time before that of the polished one, and remained constantly somewhat brighter: on removing the tube from the crucible, still looking within it, I was surprised to see the appearance reversed, the polished cylinder continuing to shine for some time after the blackened one had ceased. Cylinders of gold and of iron treated in the same manner gave the same general result; but the differences between the polished and the blackened ones were not so remarkable in these as in the silver.‡

I repeated this experiment many times and found, by observations with a stop-watch, that the blackened silver cylinder began to shine, at a medium, in two-thirds of the time which the polished one required; and that after its removal from the crucible, it continued to shine only two-thirds of the time that the other did. For this latter observation I was obliged to make a little variation in the apparatus; the tube itself becoming frequently so hot as to make the cylinders continue longer red than they otherwise would have done. I therefore took them out of the tube, to suspend them by a fine wire, and then, heating them in the ignited crucible as equally as possible (for they cannot be made to exhibit to the eye the same precise tinge of redness), I removed them immediately into a dark place.

From this experiment it would seem that a great part of the light emitted by the cylinders was absorbed from the red hot crucible, as the blackened one, which absorbs most rays, not only became first red, but likewise shone brightest. The following experiment, however, affords a different conclusion.

Experiment 2.

An earthenware pipe of a zig-zag form (fig. 2) was placed in a crucible, which was filled up with sand, the two open ends of the pipe being left uncovered; one of them was of a proper form for receiving the nozzle of a pair of bellows, the other bent into angles of the form of the letter Z. On this last was fastened a globular vessel A, with a lateral bent pipe to let out air, but exclude all external light, and with a neck in which was inserted a circular plate of glass. The crucible with the sand and the part of the pipe contained in it was then heated to redness. Having my eye fixed in the neck of the vessel A, and observing it perfectly dark within, I directed an assistant to blow with the bellows. The stream of air sent through the red-hot tube not being at all luminous, I fixed a small strip of gold into the orifice of the tube at B, which, after two or three blasts, became faintly red; thus proving that the air, though not luminous, was equal in temperature to what is usually called red heat. I then heated the crucible to a brighter redness; the stream of air blown through the brighter red hot tube still came out perfectly dark, but the strip of gold exposed to it shone both *sooner* and *brighter* than before.

Hence, it appears, that the greater brightness of the blackened cylinder, in the first experiment, was owing to its being of higher temperature, and that it would have been equally bright had it been raised to the same temperature by any other means than the absorption of *light*, the metal being here brought to a faint and to a bright ignition without the access of any visible light.

But perhaps another consequence may be drawn from this experiment. As the gold may be made to emit *light* for any length of time by being supplied with *heat* from the *dark* air of the temperature of red heat, neither the gold nor the air suffering any chemical change whatever, is not the *light emitted* identical with the *heat received?* This identity appears to be confirmed by the following observation:—That if the solar rays be made to converge upon one end of a blackened cylinder of metal, the other parts will become red hot, and emit light; or, if the rays be converged upon the tube blackened, and air passed through it, the gold placed in the dark current will yield a constant light.

The simultaneous *absorption* and *emission* of light in a red hot body is a subject of very difficult and abstruse investigation, as it involves the nature of the constituent parts of matter, and of their relative actions and arrangements. I shall not attempt any hypothesis for explaining the various phenomena, as I have not been able to form one at all satisfactory to myself; but shall proceed to state a few miscellaneous experiments and observations which, though apparently unconnected, may yet be of some assistance to the speculation of some abler theorist.

Experiment 3.

A quart of oil was poured into a bright tin vessel, which had a Fahrenheit's thermometer fixed in its neck. The mercury standing at 45°, the vessel was plunged into boiling water, and the time which elapsed before the mercury rose to 180° was exactly noted. I then blackened the exterior surface of the tin vessel, and, repeating the experiment, found the thermometer to require exactly the same time as before to rise to the same degree.

* By Mr. Thomas Wedgwood. Communicated by Sir Joseph Banks, Bart., P.R.S. Read May 10th, 1792.

† When earthenware is mentioned in this paper, the cream-coloured or queen's ware is meant.

‡ The line A B, in fig. 1, represents the position of the screen for shading the face.—Ed.

From the foregoing experiment it appears that *black* matter has no particular attraction to light in a *quiescent* state—that is, when combined as heat with other matter.

Experiment 4.

Three equal cylinders of glazed earthenware were fixed in the end of a tube (like the two silver ones in fig. 1); one of them blackened, another gilt, all but the ends within the tube, and the third with its glassy surface. These, treated in the same manner as the silver cylinders in the first experiment, all became *red* at the *same time*.

Without taking them out of the tube, I removed the whole from the fire, and, still keeping my eye upon their ends, observed them all to disappear together.

To account for the simultaneous ignition of these three cylinders, it must be considered that earthenware, being a very slow conductor of heat, the surfaces of all of them are probably heated to redness some time before any such appearance takes place in the ends between the tube. Now it is not unlikely that the black matter, the gold, and the glaze, when red hot, may reflect light equally; and, in that case there should be no perceptible difference in the time of the ignition of the ends within the tube, except the little advantage gained by the blackened one before its black coat becomes red hot, which is partly counter-balanced by the powdery matter, of which the coat consists, obstructing the transmission of heat. The surfaces of the silver cylinders (Experiment 1) on the contrary, do not become red any sensible time before the ends within the tube, the metal conducting the heat rapidly through its whole mass.

An earthenware cylinder, fastened in the end of an earthenware tube along with a gold one, and plunged into melted glass, is much longer in heating than the gold one. This is easily explained upon a well-known principle, namely, that in two bodies of unequal temperature, the colder body conducts the heat from the hotter at a rate proportionate to their difference of temperature. Now the surface of the earthenware cylinder, as the heat is conducted very slowly from it by the interior mass, soon becomes very nearly of the temperature of the hot glass contiguous to it. The surface of the gold cylinder, on the contrary, having its heat conducted from it much faster by the interior mass, is of consequence disposed to receive the heat with greater rapidity.

Experiment 5.

Equal pieces of gold, silver, copper, and iron, blackened all over, and suspended by a wire in a red hot crucible, became red in the order in which they are here set down; and when made equally red, and removed into the dark, they disappear in the same order. When just brought out of the fire they all looked equally red; but when they had cooled a little the iron was much the brightest.

An earthen cylinder tried with the metals disappeared much sooner than any of them, the interior part not communicating its heat quick enough to keep the surface of the temperature of red heat; accordingly, when broken, though the surface gave no light, the mass was luminous internally.

From a parity of reasoning, a gilt earthenware cylinder, suspended in a red hot crucible along with a gold one, would probably become red on the surface before the gold one.

Experiment 6.

A tube of unglazed earthenware, open at top, and having one half of its bottom blackened on the outside, was placed in a red hot crucible, and the eye directed as before to the inside: the part which was externally blackened became always red before the other.

The experiment was repeated with a metalline tube, but no difference could here be perceived between the blackened and unblackened half of the bottom. The reason is obvious from the foregoing observations.

Experiment 7.

To ascertain whether metals and earthy bodies *begin* to shine at the same temperature, I gilded, in lines running across a thin piece of earthenware of the specific gravity of about 2,000, and luted it to the end of a tube, the gilt side being inwards; then directing my eye into the tube, I held it within a crucible, which was gradually made red hot; but I could not after many trials perceive that either the gold or the earthenware began to shine first.

As it appears from this experiment that gold and earthenware begin to shine at the same temperature, and as no two bodies can well be more different in all their sensible properties, may it not be inferred that almost all bodies begin to shine at the same temperature?

Experiment 8.

Observing that colourless transparent glass had a paler hue when red hot than most other bodies, I conceived that it might not be luminous at so low a temperature. I therefore took a circular piece of glass, about $\frac{1}{40}$th of an inch thick, and, having gilt one side of it, exposed the ungilt side to a stream of air passed through a red hot tube, but did not perceive that the gold shone at all before the glass. This experiment, however, is not decisive; glass being so slow a conductor of heat that its exterior surface might have been heated some time before the interior, and thus have deceived the eye. I could not meet with any glass sufficiently thin for this purpose, nor think of any other possible mode of trial.

Experiment 9.

Having often remarked that the surfaces of red hot metals had an appearance different from what they present by reflected light when cold, I had an idea that this peculiar appearance might be derived from a transmission of the light through the superficial parts of the ignited body. To ascertain whether they acquired any degree of transparency by heat, I fixed a circular plate of fine gold, about $\frac{1}{50}$th of an inch thick, on the end of a tube, which was perfectly closed by it; then, having heated it to redness, and, looking down into the tube, I pressed the outer surface of the gold against single grains of gunpowder. The red light of the gold looked whiter on every flash. To be satisfied that no light found admission through the sides of the tube (which were of thick earthenware), I covered the exterior surface of the gold plate with a thick coat of clay luting, and again making it red hot, fired gunpowder with it as before, but no increase of light was perceptible from the flash, which proves that the sides of the tube were impervious to the light. When this gold was cold, I struck a few grains of gunpowder on its surface, and, looking within the tube, fired them by pressing them against a hot iron, but the light of the explosion was not then sensible.

Plates of silver and of iron gave the same results.

Experiment 10.

A lump of the most luminous marble and an equal lump of the same marble blackened over were placed together upon a mass of iron heated just under redness; the former gave out much light, the latter none. Upon a second exposure, the lump not blackened gave a faint light; the blackened one, as before, none at all. Then wiping off the black, and placing them together upon the heater, I found the one which had been blackened to emit as little light as the other; thus the phosphorescent property was nearly destroyed without any visible light leaving the body.

Experiment 11.

If a piece of glass, or glazed or unglazed earthenware, with any enamel, painting, gilding, or writing upon it, be made red hot, the coloured parts appear considerably more red than the others, and continue longer visible. Iron wire within a red hot glass tube looks much more red than the glass. Black matter upon a large polished mass of fine gold did not remain any longer red than the gold.

Experiment 12.

A bit of iron wire becomes visibly red hot when immersed in melted glass. Air, therefore, is not necessary to the shining of ignited bodies.

Experiment 13.

A piece of red hot metal continues to shine for some time after its removal from the fire, which proves that constant accessions of light or heat are not necessary to the shining of ignited bodies. If the piece be strongly blown upon, it instantly ceases to shine, for the cold air continually applied unites with

the light as fast as it leaves the body, and which otherwise would have passed to the eye.

I shall now close this paper with two or three miscellaneous observations.

Red hot bodies, though ignited by *white* light, give out only the *red* rays. Perhaps the other more *refrangible* rays, from their greater attraction to matter, may be circulating as heat, whilst the red ones, having a less attraction, yield sooner to that force which propels the light of red hot bodies. If the intensity of the incident white light be much increased, so as to raise the body to a white heat, the more refrangible rays then come out with the others, constituting together a white light.

The flash of a grain of gunpowder is a pure *white* light; but if the explosion be made within a thin, unglazed earthenware tube, closed at both ends, all the light that pervades the sides of the tube is red; the other rays must, therefore, remain united with the matter of the tube, whilst the less attractive red ones are transmitted. Thus, also, on looking at the sun through the thin bottom of an earthenware tea-cup, only the red rays are transmitted, so that the others must be retained by the matter of the cup.

It would, perhaps, be worth trying whether a body can be made *red* hot by concentrated rays of other colours.

The light produced from bodies by attrition consists of a double light: that which their powder would give out on the heater under redness, and that which particles in their surfaces give out by being made red hot. The sudden heating of a body to redness by a single blow or rub is a remarkable phenomenon, and deserves to be investigated. One effect produced upon a body by attrition is a compression or condensation of the parts on its surface; and it appears from general observation that a condensation of the parts occasions a diminution of its capacity for heat. Iron may be made red hot by repeated blows of a hammer, and I have found that if red hot iron be forcibly struck by a heavy hammer, with a sharp edge to concentrate the action, the part so struck emits a white light for a sensible time, and is probably raised to a white heat; also that my father's thermometer clay has its capacity for heat diminished one-third by being burnt to 120° of his scale, and thus reduced to about one half of its bulk; and as it loses in weight little more than two grains on a pound, the diminution of capacity can only be attributed to condensation. Many other analogous instances might be adduced if necessary; but these will, perhaps, be deemed sufficient to render it probable that the sudden ignition of the particles by attrition proceeds from the compression and consequent diminution of the capacity for heat.

I am not certain that the increase of brightness in the gold plate (Experiment 9) must be attributed to its transparency; it may arise from the gold being suddenly raised to a white heat by the light of the explosion; or the force of the explosion may condense its parts, and diminish its capacity for heat or light. There is, however, a strong analogical argument for the transparency of the gold; every body whatever, when extremely thin, is pervious to light in such quantity as to be perceptible to our eyesight; thus gold, perhaps the most opaque of all bodies, platina excepted, when beaten into leaf gold is so pervious to the green rays that, if held close to the eye, all objects are seen through it with considerable distinctness, appearing of a deepish green hue. Now the particles of matter in the gold plate being much separated from one another, if not more regularly arranged by the heat, and the intensity of the light in the explosion of the gunpowder being so great, it is not improbable that some few rays may be transmitted through the gold.

After some reflection upon the curious result of Experiment 1, I am inclined to think that the blackened cylinder does not begin to shine at so low a temperature as the polished one; and, consequently, that the *commencement* of ignition is not, in all cases, a certain indication of a particular temperature. For, when the two cylinders were removed from the ignited crucible (see fig. 1), the blackened one looked of a brighter red than the polished, and yet, in the course of cooling, disappeared in about two-thirds of the time that the polished one continued to shine, without any apparent reason for its cooling at a faster rate. Should it not, therefore, seem that it requires a greater heat to make it shine?

I am well aware that these appearances may be differently explained; and, to determine this point, I would propose the following experiment: Put larger cylinders into the tube; and, having made them red hot, drop them separately, each at the instant of its disappearing, into cups of weighed water of the temperature of between 211° and 212° of Fahrenheit; then, as any addition of heat will expand the water into steam, the loss of weight of each vessel will give an exact measure of the heat of the cylinders at the time of immersion.

A NEW LITHOGRAPHIC TRANSFER INK.

BY DR. J. M. EDER.

As every one knows, the process of lithography depends on the formation upon the stone of two films or surfaces, with different properties, one of which, secured by fatty chalk or crayon, is of a greasy surface, repels water, and takes fatty inks; the other, secured by etching, is acid and open-textured, absorbs water, and so repels grease.

Good prints depend on the degree of success in securing these different surfaces; the more greasy the one, the more acid the other, the better the lithograph. Up to the present, only two substances have been used to give the greasy surface—soap and fat, brought with wax or shellac to the right consistency for use as paint, crayon, or transfer ink. They fulfil two objects—first, to establish the greasy surfaces; second, to protect those parts of the stone from the subsequent etching action of the acid.

Lithographic ink and crayon have already been brought practically to perfection; but the preparation of a good transfer ink still offers a wide field for experiment; and the transfer inks, often very costly, in the market are still susceptible of improvement. It is still more desirable to find a good transfer ink for working on metal. All are liable to weaken, partly dissolve in the acid, or leave the stone under certain circumstances.

Working from a thorough knowledge of the defects of the existing inks, I have found in gum elemi the most favourable characteristics and consistence of all the substances experimented on; and after several years' use and testing, I believe I have found in it a satisfactory product; which, with the addition of soap and other somewhat fatty substances, such as suet and varnish, on one side takes the ink excellently and transfers well, and on the other is utterly unaffected by the etching acid.

Gum elemi is, according to Valenta, a mixture of acid and neutral gums containing the elemic acid first described by Buri. My own researches prove that this acid acts just like soap and similar fatty substances as a species of cement; hence is evident the possibility of the preparation of a transfer ink upon a basis of gum elemi in place of soap.

The printing qualities of the ink, prepared by me after a well-tested formula, I find in no wise inferior to any of the commercial transfer inks in the market, whose composition is a secret. It is a so-called stiff ink, as every transfer ink must be; but, nevertheless, it may be easily spread in a cold room or on cold stones, holds well, does not smear, and gives most satisfactory prints.

This is my recipe:—

Asphalt	20 grammes
Colophony	100 ,,
Oil of turpentine	40 ,,

Dissolve by warming, and add—

Yellow wax	20 grammes
Suet	140 ,,
Gum elemi	230 ,,
Marseilles soap	30 ,,
Linseed oil varnish (medium strength)	60-80 ,,
Finest soot	80-100 ,,

Another method substitutes ready-prepared transfer colour for soap, leaving out that, and using instead 40 grammes of transfer colour and 200 grammes Venetian turpentine. These are well cooked and rubbed together. The transfer ink works equally well on stone or zinc.

The successful commingling of the ingredients is a manipulation in itself, and requires considerable practice. All must be free from water, and care should be taken not to burn them or set them on fire. The latter part of the heating should be done with the vessel uncovered.—*Photo. Correspondenz.*

Patent Intelligence.

Applications for Letters Patent.

2,537. A. G. SPEIGHT, 257, Liverpool Road, Islington, "Machine for Corragating Paper."—February 17th.

2,628. A. J. BOULT, 323, High Holborn, London; C. LANSIAUX, and C. MERVILLE, France, "Magnesium Flash-Light."—February 18th.

2,636. E. MAITRE, 45, Southampton Buildings, London, "Transparent Case for Pictures."—February 18th.

2,671. W. FOSTER, 14, Clement's Inn, London, "Improvements in Photometry."—February 19th.

2,776. FRANK BISHOP, of the firm of Marion and Co., 53, Chancery Lane, London, "Photographic Lens Shutters." Voigtländer and Son, Germany.—February 20th.

2,781. G. OTT, 142, Fleet Street, London, "Apparatus for Glueing Picture Frames and Compressing Mitred Quoins."—February 21st.

2,812. O. FREEWORTH, 41, Eastcheap, London, "Cameras."—February 21st.

2,820. A. HESTER, 41, Cheapside, London, "Picture Holders."—February 21st.

Amended Specification.

8,722. MCKELLEN, "Exposing Photographic Paper," 1885.

Specifications Published.

2,295.—*8th February*, 1889. "Optical Illusions." CHARLES EMILE REYNAUD, No. 58, Rue Rodier, Paris, Optician.

The object of this invention is to produce the illusion of continuous or indefinitely prolonged motion of the subjects in apparatus of the "praxinoscope" class patented by the inventor in the year 1877, under No. 4,244, in which, as in the "Zootrope" and other analagous combinations, the illusion of motion has hitherto been necessarily limited to a repetition of the same sequence of positions at each rotation of the instrument.

The present improvements may be applied to apparatus carrying either opaque or transpareut pictures, the former illuminated by reflected light for direct view, and the latter by transmitted light for projection on a screen.

After describing the mechanical details of his invention, M. Reynaud says:—

The "illusion of motion" is produced as in the original praxinoscope and other like instruments, but with this essential difference, that the successive phases of action of the figures, instead of being limited to those comprised in a single revolutiou, may be varied and prolonged to a practically indefinite extent, dependent only on the length of the flexible band, thus permitting, for instance, the reproduction of a continuous theatre scene, comprisiug an almost iufinito variety of actors in their successive positions on the stage.

3,347.—*25th February*, 1889. "Books for Exhibiting Photographs." HENRY WILLIAM TAUNT, 9 and 10, Broad Street, Oxford, Photographer.

My invention consists of an improved method of constructing show books for photographs by which the photograph with its supporting leaf can at once be delivered to the purchaser.

My plan is to make one or more perforations in the leaf so that it can be at once detached, such perforations being free, or protected by an additional backing of thin paper or other material so as to guard it from accidental removal.

4,047.—*7th March*, 1889. "Apparatus for Changing Plates or Films." ENRICO FERRERO, Riva Inglemere Road, Forest Hill, Merchant.

The inventor claims:—

1st. A combined dark-slide and changing-box provided with a flexible bag having a hole or holes for permitting the insertion of the hand or the thumb and one or more fingers, whilst excluding light.

2nd. A changing-box provided with a flexible bag having a hole or holes for permitting the insertion of the hand or the thumb and one or more fingers, whilst excluding light, and with a lid or cover which can be opened and closed within the said bag.

3rd. The pressure-board provided with means whereby it will be drawn back in the operation of opening the lid or cover of the changing-box, and will, when the said lid or cover is closed, press the film or plate against the edges of the exposure-aperture in the dark-slide.

4th. The combination, with the dark-slide, of the changing-box, the pressure-board, and a suitable spring or springs for forcing the said pressure-board and the plates or films against the back of the dark-slide.

5th. The changing-box having the spring lid or cover and the jointed or toggle arms for preventing accidental closing of the said lid or cover.

6th. The improved apparatus constructed substantially as described with reference to the drawings accompanying the specification.

4,131.—*March 9th*, 1889. "Detective or other Cameras." FRANK MIALL, Photographic Apparatus Maker, 13, Shelgate Road, Northcote Road, Battersea Rise, Surrey.

My improvement in detective or other cameras consists of the use of two grooved boxes superposed on each other, with parallel racks on the sides or ends of each box, the said racks to be actuated by a pinion at right angles to and between them, having on its end either a square (to be used with a key) or a milled head, on turning which the one box containing the unexposed plates or films (each in a suitable carrier) advances as the other recedes, and drops a plate or film from the upper box into the lower one, through a fixed slot, thus always ensuring each plate or film to be exposed in a fixed plane to the lens. The said grooved boxes to slide in or on suitable grooves or runners formed in or on an outer case or box, in the front of which said box, and oscillating at will, is a segment of a circle (of metal or other suitable material) either in a vertical or horizontal position, and forming the exposing shutter, the said segment having an opening for the light to pass through the lens to the sensitive plate or film; the outer ends of the said segment to be opaque, so that before and after exposure the lens will be covered. On the centre of the segment from which the radius is struck is fixed a pinion, which engages in an oscillatiug rack, which can be actuated from any part of the camera either by hand or pneumatic influence.

The camera takes the form of a box of such varied shape as may be found most convenient, and can be covered with paper or other material to suit the individual tastes of the users, and either carried by a strap, or handle, or the like.

The inventor claims:—

1. The use of two grooved boxes superposed on each other, and actuated by racks and pinion substantially as described, so that the boxes move simultaneously in opposite directions.

2. The use of a segment of a circle having an opening in the centre, and with opaque ends actuated substantially as described, and forming an exposing shutter.

3,790.—*March 4th*, 1889. "Photographic Cameras." HENRY JOHN GRAY, 225, Piccadilly, London, Truss Maker.

My invention relates to photographic cameras, and has for its object to provide an improved camera which is especially adapted for use by detectives, and which is more compact than cameras of the same kind as heretofore constructed.

According to my said invention, the box of the camera is divided by a partition into two compartments, one of which forms the camera proper, while the other serves for the reception of plates, papers, or other media for carrying sensitised surfaces. The said plates or the like are arranged to lie horizontally one upon another in a stack, and are successively transferred from the bottom of the stack into position for the exposure, and thence to the top of the stack.

The transfer is effected by means of two pivotted lever carriers, and a slide or plunger. The said slide or plunger serves to push the lowermost plate of the stack on to the first lever carrier, which latter then delivers the plate on to the second lever carrier into position for the exposure. After the exposure, the second lever carrier is operated to return the plate to the top of the stack.

The slide or plunger is provided with an auxiliary plunger which serves to push the plate entirely on to the first lever carrier.

The lever carriers are provided with spring clips for holding the plates thereon.

In order to prevent the films of the plates or the like from being rubbed, the said plates or the like are carried in frames or holders.

4,264.—*11th March*, 1889. "Tissue Transfer Paper." THOMAS PHŒNIX, Liverpool Road, Newcastle-under-Lyme, Paper Maker, and GEORGE KIRK (administrator of the personal estate and effects of Mary Ann Lamb, Widow, Paper Manufacturer, deceased), of Uttoxeter, Gentleman.

The inventors claim :—

1. The preparation of tissue paper for printing transfers thereon by sizing the tissue paper by causing it to pass into contact with the upper part of a sizing roller, the lower part of which dips into a trough containing size, and then to pass between the surface of the sizing roller and that of a soft pressure roller.

2. The preparation of tissue paper for printing transfers thereon by sizing the same by causing the paper to pass into contact with a sizing roller, and to be carried down thereby through a trough containing size, into which the lower part of the cylinder dips, and then to pass between the surface of the sizing roller and that of a soft pressure roller.

3. The preparation of printed transfers for transferring designs on to pottery ware by causing tissue paper to pass in contact with a roller, and whilst on the roller to receive size, and then to travel on continuously between an engraved printing roll and a soft impression roll.

4. The preparation of tissue paper for printing transfers thereon by arranging the roll of tissue paper to bear upon the surface of a revolving roller, and so to be driven, and as the paper unwinds causing size to be applied to it, and causing the sized paper to be carried on the sizing roller between the surface of the said roller and a soft pressure roller.

5. A machine for the preparation of printed transfers for transferring designs on to pottery ware consisting of a roll from which the tissue paper is unwound ; a sizing roller ; a soft pressure and impression roller ; and an engraved printing roller ; the whole revolving at the same surface speed, and the paper passing in contact with these rollers successively.

4,261.—*11th March*, 1889. "Photographic Lens Shutter." THOMAS RUDOLPH DALLMEYER, 25, Newman Street, Oxford Street, London, Optician, and FRANCIS BEAUCHAMP, Hope Cottage, Whalebone Lane, Chadwell Heath, Essex, Engineer.

This invention relates to improvements in photographic lens shutters of the kind described in the specification of a patent granted to us, dated the 12th day of October, A.D. 1887, No. 13,844.

In the invention described in the specification of the aforesaid patent, the shutters are opened more or less gradually, and, as soon as opened, they begin to close again more or less gradually, so that the quantity of light reaching the photographic film gradually increases as the shutters open, and gradually decreases as the shutters close, the closing commencing immediately after the maximum opening has been obtained, the result being that the plate receives the maximum quantity of light for an instant only. The object of one part of our invention is to cause the shutters to open as instantaneously as possible, to remain wide open for a definite length of time, and then to close as instantaneously as possible, whereby the plate receives the maximum quantity of light during a longer portion of the time occupied in the opening and closing of the shutters than in the arrangements described in the aforesaid specification.

In order to effect this object, we move the shutters to and from each other by means of two levers somewhat in the manner described in the aforesaid specification, but preferably so arranged that each lever is operated independently of the other, instead of one lever being operated by the other, as in that case. We operate the said levers by means of a crank pin rotated by means of a coiled spring. This crank pin engages in a curved slot in each of the shorter arms of the levers, the said slots being so shaped that the crank pin acting upon them for a very small portion of its revolution suffices to move the two levers far enough to open the shutters to their fullest extent ; when that is effected the crank pin passes along portions of the slots in the levers which are concentric with the path of the crank pin for another and larger part of its revolution, whereby the levers are not acted on by the crank pin, and the shutters are consequently held wide open while the crank pin is traversing these concentric parts of the slots. The crank then reaches and acts upon parts of the slots which are not concentric with its path, and move the levers so as to close the shutters during another very small portion of its revolution. The axis of the crank or crank plate carrying the crank pin, which is actuated by a coiled spring as before explained, carries a disc furnished with three stops. Two of these stops come in the line of a catch or pawl on a releasing lever. When the axis is turned, winding up the coiled spring until the catch or pawl drops behind the first of these stops, the shutters are wide open, and are held so by the said catch and first stop, so that the necessary focussing can be effected. When the axis is turned further, so that the catch or pawl drops behind the second of the stops, the shutters are closed again and are held so by the said catch and second stop until the catch is withdrawn from behind the said stop, when the coiled spring acts, turning the crank pin and causing the practically instantaneous opening of the shutters, their retention wide open for a definite time, and then their practically instantaneous closing as before explained. The third stop on the aforesaid disc has a twofold function : firstly, when the shutters are in the closed position it comes against a suitable stop, so as to prevent rotation of the crank pin beyond a certain point, whereby the said crank pin is prevented from pressing unduly on the slots in the levers ; and secondly, it forms a means in conjunction with an adjustable stop on the releasing lever, or with a stop on a separate lever, whereby the shutters can be held open any required length of time when a long exposure is desired.

Another part of our invention consists of improved means of guiding the two shutters in their horizontal movements to and from each other. Instead of the shutters sliding in grooves made in the upper and lower parts of the lens mount, we arrange them to slide at their upper or lower ends on a guide rod or spindle placed at the upper or lower part of the lens mount, and we leave them free at their other ends, the points of connection of the actuating levers with the sliding shutters being preferably placed near the aforesaid guide, rod, or spindle. By these means the possibility of the shutters jamming in their guides is avoided.

17,998.—*November 12th*, 1889. "Cameras and Dark Slides." THOMAS (Archdeacon) COLLEY, 18, Landsdowne Circus, Leamington, Warwickshire, Archdeacon of Pietermaritzburg in Natal.

The inventor claims :—

1. A plate-holder or dark slide for photographic cameras,

the lid of which plate-holder is so weighted that it shall, when placed at the proper angle, fall open of its own weight.

2. A swing-frame for the said plate-holder, which, when placed in the camera made or adapted for its use, shall so rotate upon its axis that the lid of the plate-holder which it carries may be opened and closed at pleasure.

3. An indicator outside the camera that shall show the position and govern the action of the swing-frame and plate-holder inside the camera when the camera is closed, and everything is ready for immediate and unobserved use.

4,649.—*March 16th*, 1889. "Shutters for Photographic Cameras." THOMAS WRIGHT GREENALL, The Grammar School, Hartlebury, near Kiddermiuster, Clerk in Holy Orders, and FRANK BISHOP, of the Firm of Marion and Co., of 22 and 23, Soho Square, in the County of Middlesex, Dealers in Photographic Materials.

This invention relates to an improved so-called "Instantaneous" shutter for photographic lenses. The shutter is of that kind which opens and closes upon a diametrical line, by the motion in opposite directions from the centre to the sides of a pair of plates or wings pivoted upon a common centre, and overlapping when closed.

The invention relates essentially to the mechanism whereby the plates or wings are operated, and the object of the invention is to simplify this mechauism and reduce the cost of manufacture. The plates or wings are operated by a pin moving in a curved angular or bi-angular slot in each of them, the slots lying in a direction such that the two extremities of each slot are in a line about radial to the centre of motion of the plate or wing, and the slots being oppositely bent or curved so that motion of the pin from one end to the other of the two slots will cause simultaneous motion of the two plates or wings in opposite directious, the motion of the pin through the first half of the slots causing an outward separating or opening motion of the plates, and the motion of the pin through the second half of the slots causing an inward or closing motion of the plates. This actuatiug pin is carried or actuated by a lever pivoted to the frame, and acted on by a spring provided with means of varying its tension for the purpose of regulatiug the velocity of motion of the plates according to the length of exposure required, a spring trigger being also provided having notches or shoulders adapted to engage with the lever, and hold the plates either in the closed or open position as required, said trigger being released either directly by hand or by pneumatic agency, as well understood. The pin through which the plates are actuated projects through a slot in the frame, and serves as the medium through which the shutter may be brought to the open position for focussing for a prolonged exposure, or "set" for a short or "instantaneous" exposure.

19,770.—*December 9th*, 1889. "Photographic Carriers or Sheaths." FRANK MIALL, 13, Shelgate Road, Battersea Rise, Surrey, Manufacturer of Photographic Apparatus.

The inventor claims:—

1. In the constructiou of carriers or sheaths for the holding of sensitive photographic plates or films, the use of retaining catches or clips.

2. The use of retaining catches or clips in connection with carriers or sheaths for holding sensitive photographic plates or films.

PHOTOGRAPHIC CLUB.—The subject for consideration on March 5th will be "Artificial Light as an Auxiliary to Daylight," followed by a selection of lantern slides of Norway, by Mr. J. B. B. Wellington. March 12th, "Sterescopic Photography."

A SIMPLE VIEW METER.—For time exposures carry a light, compact tripod. Ascertain by calculation or experiment the number of inches that at arm's length from the eye will include, with the lens used, the view upon the plate. A small rule, or its equivalent, held with extended arm at right angles to the line of vision, will then always give instant information, required before every exposure.—*A. W. Dimock.*

Correspondence.

STEREOSCOPIC VISION.

SIR,—Mr. G. Macdougald, in his communication to the Dundee and East of Scotland Photographic Association, has, while trying to combat some statements alleged to have been made by me, so completely overlooked my real position in the matter, and has made so many statements, the absurdity of which he might have seen had he consulted the most elementary class-books, that I might well pass his remarks unheeded. Still, it may be well to point out some matters, not of opiuion at all, but perfectly well known to every beginner in optical science, and perfectly clearly laid down by every writer who, within many years, has treated the subject of stereoscopic vision.

In the first place, I suppose I must once more point out that the origin of the discussiou was a remark by "F. M. S." iu *Photography*, May 9, 1889, touching stereoscopic photography *in its relation to art*. I have never denied the scientific uses of the stereoscope; on the contrary, I did them full justice. My poiut all along has been that stereoscopicity is no attribute, much less au essential, of art. But to turn to Mr. Macdougald's optical utteraucos.

He begins with the old story of stereoscopic vision by squinting. That is right enough for those who can do it, probably not one in 1,000 without being educated up to it. Mr. Macdougald's alternative method is to "look at the right picture with the right eye, and the left in like manner with the left." He admits that personally he cannot do it; well, so far as goes stereoscopicity, in which his soul delights, his inability is no loss, for there is no stereoscopic vision in such a case. (Text-books *passim.*)

"It is surely more natural to look at a double pictorial representation than at a single." (Macdougald.) "When a body of moderate size, ascertained by touch to be solid, is viewed with both eyes, the images of it formed by the two eyes are necessarily different. . . Nevertheless, they coalesce into a common image which gives the impression of solidity." (Huxley, *Elementary Physiology.*) "We have two eyes, most of us, but we do uot, under normal conditions of diet, *see double.*" (Pringle.)

Mr. Macdougald writes that it appears that "Mr. Pringle labours under the impression that binocular vision—that is, vision giving the appearance of solidity—requires that each eye looks at the object from a different standpoint." I confess I am under that impression, but find uo "labour" in comprehending the truth, nor in agreeing with every text-book on the subject that I can find. Without the seuse of touch, and without two eyes, we cannot have the impression of solidity, nor of relative distances. I should like Mr. Macdougald to explain how two eyes can look at an object simultaneously from the *same* standpoint. "One may mount two prints from the same negative," says Mr. Macdougald, "and such priuts will give the appearauce of solidity when viewed either by the unaided eye in the manner above mentioned, or through the stereoscope." Here is news indeed: but if there were the slightest foundation for such an assertion, who so foolish as to carry a stereo-camera and make stereo-negatives when single ones will do? If Mr. Macdougald will consult "Hardwich and Taylor," or indeed any class-book on optics, he may derive some benefit.

On the binocular miscroscope, as proof of his theory, Mr. Macdougald surpasses himself. "The binocular microscope," he says, makes it "at once apparent that the appearauce of solidity or stereoscopic impression does not rest on the fact of each eye having a picture for itself." Well, I always thought it did exactly rest on that fact. If Mr. Macdougald ever used a binocular microscope, it is very strange that he did not notice that not only does each eye see the image projected by *one-half* of the objective, but by means of a prism the image projected by the right half of the objective is projected to the left eye, while the right eye views the image projected by the left portion of the objective; and further, when the instrument is so arranged that the right eye looks through the

right half of the objective, and *vice versâ*, the image is not seen stereoscopically, but pseudoscopically. (Another death-blow to the second alternative method of seeing stereoscopically with the unaided eye mentioned above.) The binocular microscope, in fact, furnishes a complete refutation of nearly every sentence on stereoscopic vision in Mr. Macdougald's paper with which he regaled the Dundee Society. (See "Carpenter," and any other text-book on the microscope.)

Mr. Macdougald says I "dislike the small hole trick." This is proof that he has not carefully read what I wrote. I expressed neither liking nor dislike of it. He refers the impression of solidity obtained by the "small hole trick" to suppression of surface on the picture. I do not believe in this theory of his at all; I attribute the illusion to brain action chiefly. But till the elements are mastered there is not much use discussing more difficult matters. Mr. Macdougald says, "In what, then, does stereoscopic vision consist? That is a very difficult question to answer." Possibly, but it is answered for us, even if we are incompetent to work it out for ourselves, in every treatise on elementary optics with any pretension to completeness.

I omit notice of the bantering tone of Mr. Macdougald's paper. No doubt it may have amused such of his hearers as were unaware of the extraordinary weakness of his arguments, and his entire misapprehension of stereoscopic optics.

I also reserve further comment on the fact that in my original article (*Photography*, June 13, 1889,) I dealt with stereoscopicity as related to art. I said, and I say, solidity is not art, nor is art illusion. ANDREW PRINGLE.

AMATEURS AND PROFESSIONALS.

SIR,—There is one consideration that has escaped the notice of "Photophotos" in his critical review of Amateurs and Professionals in Holland (see page 139 of last week's NEWS). The definitions are good and humorous, and the shallow fear that the amateur is likely to supplant the professional is fairly stated and disposed of. Another aspect of the case has, however, been entirely overlooked—namely, the fact that the widespread practice of photography by numerous amateurs tends to elevate the status of the professional, and inspire a higher appreciation for the generally superior character of his work. His claims thus become more widely recognised, and those who seek for experience, especially in portraiture, must needs avail themselves of special talent, training, and appliances. To borrow a simile:—The regular forces of the British army were never so popular or so well appreciated until the volunteers sprang into existence, and then came a laudable feeling of rivalry in shooting and drilling, which has since proved most beneficial both to the regular and auxiliary services. Old methods and weapons were criticised, and the army gained more by friendly competition and healthy rivalry than was possible formerly without such occasional stimulus and review. In fact, the volunteers have popularised and vastly improved the efficiency of the regular army. There is no question about this; and so it may be with the mutual relations of the amateur and professional photographer; the latter gains much by securing a wider appreciation of his highest aims by an educated public, and reaps the benefit of more extended patronage.

If the army of professionals is occasionally recruited from the ranks of trained amateurs, so much the better for all concerned; real progress cannot be in any way imperilled, but, on the contrary, assisted, and a wider *clientèle* created.

Respecting definitions: There is an old adage, "Once a captain, always a captain." Does this stand true of the professional photographer? I know a man who, a quarter of a century ago, took pay for several years as an instructor and photographer in the Government service, but now he only uses his camera as an amateur. To which class does he belong? Again, your Dutch correspondent says, "One, however, of the most pronounced characteristics of divergency is undoubtedly the winter sleep or hybernation of the amateur." But if this be true, what shall be said of the large class of quasi-professionals, like those having studios at suburban or watering places, who regularly "hybernate," or practise photography only during the season, and follow some other occupation during the winter?

Is there any "hard and fast rule" applicable to such cases? I for one would like to know what answer to give to these and similar enquiries. JOHN SPILLER.

HACKNEY PHOTOGRAPHIC SOCIETY.

SIR,—Below is our programme for March, 1890, at Morley Hall, Hackney, Room No. 4:—Thursday, 13th, "A Talk on Photographic Optics," by Mr. J. Traill Taylor. Thursday, 27th, "Photography." Prize lantern slides.

W. FENTON JONES, *Hon. Sec.*
12, *King Edward Road, Hackney, N.E.*

PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.

SIR,—So many applications have been received for copies of my pamphlet on "Methods of conducting a local photographic Survey of Warwickshire" (methods which are equally applicable to other districts) that I have had it reprinted, and copies can be obtained post free, sixpence each, from Mr. A. J. Leeson, 20, Cannon Street, Birmingham (Hon. Secretary, Birmingham Photographic Society), or from

W. JEROME HARRISON,
Science Laboratory, Board School, Icknield Street, Birmingham.

P.S.—The price named just about pays for printing and postage, but any profit will go to the Society's funds.

FOCUSSING APPLIANCES.

SIR,—In reference to the above—*vide* the leader in your impression of February 14th—for about the twentieth time I recommend my brother amateurs to adopt for a focussing screen the plan I have had in use for some years, viz., a circle or strip of plain glass in the centre of the screen. I made mine, and have made a few for friends since, by cleaning and varnishing an old negative plate, when cool rubbing it with the ball of the thumb, to get a *very fine* tooth, much finer than any ground glass, then removing a small circle or strip of the varnish in the centre of the plate. This gives a bright picture quite up to the edges of the plate; and in the centre on the plain glass, with a focussing glass, absolute microscopic sharpness. Lastly, if you should have the misfortune when away on a tour to break your screen it is easily replaced. A quarter of an hour will make it. W. T. F. M. INGALL.
Greenhithe, Kent.

PATENTS AND PHOTOGRAPHIC PROGRESS.

SIR,—There is no doubt that the protection afforded by the patent to the outcome of the labour and ingenuity of the actual inventor is an advantage to scientific progress, inasmuch as it acts as a spur and incentive to experimental research; on the other hand, there is no greater bar to advance and improvements in any direction of progress than the practice of claiming a monopoly of manufacture on the ground of novelty where no such novelty exists. It would be well if claims for invention were more carefully scrutinised than appears to be the case, although every facility has been lately given by the photographic journals which record the applications made in their department. It may be said that the public have a means of redress in cases of invalidity of patents by opposing or disregarding the claims which are made. This may be true in theory, but practically it is well known that the irrecoverable expenses, and annoyance, and loss of time involved, even in cases of successful issue, deter many from taking that step. There may be some of your readers, interested like myself in the special subject of actinometry, to whom the following references to some passages in a work by a well-known writer may, perhaps, be of benefit.

Capt. Abney, in the 1884 edition of his "Instructions in Photography," gives a figure and description of the "Woodbury Photometer," the principle of which is the determination of the actinic power of light by the exposure of a strip of sensitised paper, coiled in a small box, in the form of a compass. The actinic light is measured by the darkening of the exposed paper in comparison with a standard tint or tints

provided for that purpose. The writer goes on to say, "I believe it would be an improvement to *use bromised paper for the actinometer*," and in a former part of the work a formula is given for the use of *nitrites* with the bromised silver solution, the well-known salts by which the bromised paper is made to darken in the light without development.

Since the publication of this edition of the "Instructions" two applications have been made for patents for actinometers, which may now be compared with the above extracts.

I need not point out that the matter has a wider significance than the invalidity or validity of these patents. It is a public, not a personal question, and on the solution of it depends our conclusion as to whether the results of research and experiment given to us by public writers in works of general reference are for the full and free use of the public, or only for the benefit of individual monopoly. EXPERIMENTALIST.

THEODOR PRUMM.—The German Photographic papers announce the death, on the 11th inst., of this well-known and skilful portrait photographer, at the age of forty-nine.

ALBEMARLE AMATEUR PHOTOGRAPHIC SOCIETY.—Mr. Walter Pilkington, of St. Margaret's, Newlands Park, Sydenham, asks us to record the formation of this Society, established for the "social discussion of the technicality of photography."

CAMERA CLUB CONFERENCE, 1890.—The Conference, as already announced, will take place at the Society of Arts on Thursday and Friday, March 20th and 21st, under the presidency of Captain Abney. Amongst the papers to be read and discussed will be the following:—"The Art of Drawing and Photography," by Mr. A. M. Rossi; "Photography by the Light of the Electric Spark," by Lord Rayleigh; "The Latent Image," by Mr. C. H. Bothamley; "Limitations in the Treatment of Subjects by Focus," by Mr. T. R. Dallmeyer; "Collotype and Photo-Etching," with practical illustrations, by Mr. W. T. Wilkinson; and other papers by the President, Mr. Lyonel Clark, and others. It is further proposed to bring forward, in as complete a manner as possible, the subject of photographic exhibitions and their regulations. The exhibition of apparatus will be as usual in the library of the Society of Arts. All photographers or others interested in the subjects under discussion are invited to be present.

THE PHOTOGRAPHIC CONVENTION.—The 1890 meeting of the Photographic Convention will take place at Chester, from the 23rd June to the 28th inclusive. The proceedings will open on the evening of June 23rd with a conversazione, at which the President's address will be delivered, and there will be a lantern exhibition. Excursions have been arranged for each day during the week. The evenings will be devoted to the reading of papers and discussions. An exhibition will be held of novelties in apparatus, and no charge will be made for space. The Convention dinner will take place on the evening of the 27th June. Arrangements are being made for excursions to the following places:—Moreton Old Hall, Conway, Bettwys-y-Coed, Carnarvon, Harwarden, Llongollen, and other places. Also a trip on the Mersey to witness the regatta of the Mersey Yacht Club. Cheap railway tickets to these places will be issued by the railway companies upon production of membership tickets.

PHOTOGRAPHIC NOVELTIES.—From Mr. Robert Talbot, of Berlin, we receive the first number of *Photographische Neuheiten*, or "Photographic Novelties," the object of which is stated to be to furnish the amateur and professional photographer, the photographic printer, the zinc and copper etcher, and the photo-lithographer—all those, in fact, who are directly or indirectly interested in photographic experiment or research—with the latest news in the photographic world, in the quickest, clearest, and most concise fashion. It is proposed by the editorial staff to give a comprehensive description of all the photographic novelties which may be transmitted to them, both from Germany and elsewhere, with their prices attached, and illustrations in such cases as make them desirable or convenient. The editorial staff, through its intimate association with the well-known firm of Romain Talbot, claims to be in a position to give the very earliest notice of all novelties of interest or importance.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the technical meeting of this Society, held on the 25th inst., the chair was occupied by Mr. W. E. DEBENHAM.

A letter from the Secretary of the Royal Geographical Society was read, in which it was stated that the photographs of Caucasian scenery, taken by Signor Sella, would be on view until the end of the month.

A shutter that had been sent by the manufacturer was shown and handed round. The arrangement for resetting after each exposure was effected by the pressure of the pneumatic ball that actuated the release, so that it was always ready for use without resetting. If wanted as a time shutter, there was an arrangement by which two pressures of the ball were used, one for opening and one for closing. A dark-room lamp was also shown; it was for use with benzoline, and resembled a brass candlestick in appearance. There was a ruby chimney surrounding the flame.

The CHAIRMAN remarked that manufacturers of these things were rather conservative in keeping to red instead of using deep yellow.

A letter was read accompanying some photographs sent by a photographer in the provinces, who asked for an explanation of some peculiar markings that covered about half the plate. The photographs had been taken in a hall at night, and one of them showed a row of gas jets. It was noticed that the markings were parallel, and proceeded from the direction in which the gas jets appeared, and the opinion was expressed that the marks were in reality photographs of the gas jets spread across the plate by a movement of the camera, probably caused by opening or closing the dark slide.

Mr. H. CHAPMAN JONES showed a lens and camera, which he called the memorandum camera, for taking photographic notes of any subjects of which it might be required to obtain a reproduction. As it was desired that it should be available under all practicable conditions of light, the lens was of the rapidity taken as unity in the Photographic Society's standard, $f/4$. It was fitted with Swift's iris diaphragm, which was so arranged that there was literally no projection from the tube. The size of plate used was half of the quarter-plate, or $3\frac{1}{4}$ by $2\frac{1}{8}$ inches. The lens for the purpose was of about $3\frac{1}{2}$ in. focus. It was graduated so as to be fixed for objects at certain distances from two feet upwards. At the two feet distance it was practicable to get quite a readable negative from a page of a book, which might be easily done by setting up the book on an ordinary table at the distance mentioned, and adjusting the diaphragm to the smallest opening. The shutter was of the roller kind, and had a long opening in proportion to the diameter of the lens, being more than three times as long as the diameter. The rollers were made one inch thick, so that violent speed of rotation was not necessary in order to obtain a quick exposure. He had found a difficulty in obtaining a material strong enough to bear the strain of the strong spring necessary, but had overcome the difficulty by using black tape at the ends of the rollers, and attaching the blind itself to those tapes. The blinds and tapes passed completely round the rollers at both ends, so as to distribute the pull, and render them less liable to be torn off. Mr. Samuels's arrangement of plates was adopted, although of course a roller slide could be used if desired. The camera, with twelve plates complete, weighed thirty-five ounces. He used a view meter and finder, which was furnished with a square ground glass, on which lines were ruled, which indicated both positions, vertical and horizontal, in which the plate could be used, so that a choice might be made from actual inspection of the two positions. With the shutter working with its full opening, it was fitted for ordinary instantaneous work, but if desired, by narrowing and opening, and placing it next to the plate, a rapidity exceeding that mentioned by Anschutz for photographing such objects as bullets in motion could be obtained. The camera being narrow, could be employed as a secret camera more easily than most others, but he did not personally desire to use it as a secret camera. In order to show that

one need scarcely ever fail to secure a photographic record, whatever the light or time of day. He had taken some street scenes on the 21st of December, at various hours of the day. The day itself was a dull one. These photographs were exhibited, as well as one of a printed page which, under a Ramsden eye-piece, could be easily read. For developing he used a dish of eikonogen, and had another dish at hand containing a weak solution of bromide, into which any plates were removed that gave signs of over-exposure. After a stay in this solution they were, if necessary, returned to the eikonogen bath to gain density.

The CHAIRMAN noted that a lens of f 4 aperture was used, although, doubtless, it would generally be stopped down to $f/8$ or less. When this stopping had to be done, it was, according to his experience, better to use a lens originally not of so rapid a character, as the field might be, and was, made flatter than was practicable with the more rapid lens. Was that in accordance with Mr. Chapman Jones's experience?

Mr. CHAPMAN JONES replied that, in so far as flatness of field is concerned, that was so, but as occasions did arise for using the utmost available rapidity, he had decided to have a lens which would give that when required. The curvature of field with this lens was equal to $\frac{1}{10}$th of an inch at the margin of the plate of the size indicated.

Mr. W. BEDFORD noted particularly the smooth, spiral movement of the lens tube for focussing.

Mr. W. ENGLAND would use the roller shutter next to the plate.

Mr. CHAPMAN JONES said that that was the worst position for the shutter, although, for specific purposes, like that of photographing a bullet, it might be necessary.

Mr. COWAN exhibited three bromide paper photographs of cabinet size to show the effect of a very small quantity of bromide in an eikonogen developing solution. The first had received a certain exposure, and been placed in four ounces of a fresh solution of eikonogen to develop. It came up grey and flat, and the next print therefore received only half the exposure. This came out bright and powerful, but a third print that had received the same exposure as the first one came out best of all. The only difference between this print and the first one was that it was the third to be developed, and the eikonogen had, therefore, accumulated a small quantity of bromide given out in the development of the first two.

Mr. ATKINSON showed a print thirty-two years old, printed upon salted paper, and not mounted. It appeared to be quite free from fading.

The CHAIRMAN said that unmounted prints notoriously had a longer average life than mounted ones. The print shown looked, too, as if it had been toned with sel d'or. Was that so?

Mr. ATKINSON replied that it had been toned in that way.

The CHAIRMAN continued that that process conduced very much to permanency. It was to be regretted that it had not been found practicable to use it generally for albumen prints. Many unmounted, and some mounted, albumen prints certainly existed which had been printed for many years without showing any signs of fading, but the sel d'or bath deposited so much gold on the print that there was considerably more probability of permanency in prints so produced.

CAMERA CLUB.

ON Thursday, February 20th, a paper communicated by Mr. W. K. Burton, on "One or Two of the Tenets of the Naturalistics," was read by Mr. A. Priugle; Mr. W. A. GREENE occupied the chair.

Mr. BURTON, iu his paper, took the view that any want of sharpness in the principal objects or planes, and any falling off away from the centre of interest in the different planes, could not be defended upou optical principles, but that, on the other hand, these principles would appear to demand that planes other than the plane of chief interest should be less perfectly defined. He further dealt with the subject of imaginatiou in the pictorial arts, and the possibility of introducing it in photographic work.

The discussion was opened by Mr. DAVISON, who observed that the variation in focus of different planes admitted and argued by Mr. Burton was one of the chief contentions of those called "Naturalistics." He thought it was more a matter of the mental attitude whether representations should be sharp or not. A definite detailed examination of nature was the scientific, not the artistic attitude. He thought imagination could not be expected to supply the truth of representation, in which lay the thrilling charm experienced by an artistic perception of a beautiful scene in nature.

On Thursday, March 6th, Mr. A. Pringle will treat of the subject "The Optical Lantern." Meeting at 8 p.m.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 20th Mr. A. HADDON occupied the chair.

Mr. J. B. B. WELLINGTON showed two bottles of eikonogen recently received from the manufacturers. In one of the bottles the crystals had become quite dark; there was no trace of any discolouration of the crystals in the other bottle. Both bottles had been received at the same time.

The CHAIRMAN had exposed a mixture of powdered eikonogen and sulphite to the air, and had also enclosed some of the powder in a sealed tube, raising the temperature to boiling heat for half an hour; but little change of colour was noticeable in the samples passed round. He had also taken—

Eikonogen	1 part
Carb. soda	2 parts
Sulphite	4 ,,

A portion of this was kept in paper, and the remainder placed in a sealed tube. In both cases considerable discolouration had taken place. The Chairman said, from his experiments, he was of opinion that the sample of sulphite used by Mr. Cowan, when he succeeded in developing plates with pyro and sulphite, and also eikouogen and sulphite alone, contained a large excess of carbonate.

A questiou was asked whether any member had used anglol.

Mr. J. B. B. WELLINGTON said he had found it a rather slow developer. The results were very similar to those by eikonogen development.

Mr. A. COWAN exhibited a series of bromide prints developed with various developers—ferrous oxalate, eikonogen and carbonate of lithium, with aud without bromide, pyro and carbonate of lithium, pyro and eikonogen mixed, eikonogen, both with weak and strong alkalies, hydrokinone of different strengths, and eikonogen with caustic alkali. Two of the prints were selected, which were generally acknowledged by the members present to be excellent both in detail and quality of image. The prints had been developed by use of the following formulæ respectively:—

Eikonogen	4 grains
Sulphite	32 ,,
Carbonate of lithium	2 ,,
Hydrokinone	2 grains
Sulphite	8 ,,
Carbonate of potassium	10 ,,

Mr. Cowan said his chief object was to find a good developer that did not require to be followed by the acid bath. Hydrokinone gave extreme density, consequently it would be found a good developer for prints from thin negatives.

Mr. P. P. DRAGE showed a negative with some peculiar transparent markings on it. The negative had been developed with washing soda and dry pyro; it took a long time to come out.

Several members gave it as their opinion that the markings were due to air-bubbles.

PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING was held at the Chamber of Commerce Rooms, Tokyo, on December 12th, when the following were elected members of the Society:—Mr. Tamamura, Dr. G. Wagener, and Messrs. Katzuzo Takenouchi, E. H. R. Manley, and J. B. Coulson.

Objection had been taken to a certain proposed member on account of his having copied without permission, and sold, the pictures of a member of the Society. An explanation which was satisfactory both to the objecting member and to the Society was given, but the following resolution, proposed by Mr. E. R. Holmes, and seconded by Mr. Pallister, was unanimously passed :—"That this Society discountenances, by all means in its power, the practice of copying the photographs of other artists for sale, and that, if the practice be continued, the Society will take into consideration the desirability of making a bye-law whereby such practice shall *ipso facto* exclude from membership of the Society."

Mr. K. OGAWA exhibited the colossal camera with which he had made photographs direct, measuring 38 by 30 inches, for the forthcoming exhibition, and an enormous tripod intended to be used with it in photographing interiors. The top of the tripod reached the roof of the hall. A monster printing frame for making the pictures on paper measuring 4ft. 6in. by 3ft. 6in. was also shown.

Mr. KONISHI showed the "Kodak," the smallest of the numerous hand cameras now so popular, and Mr. Kajima some very beautiful opalotypes done on opal glass that had been coated with emulsion in Japan.

Mr. W. K. BURTON read a paper on "Eikonogen," the new developer. The results of his experiments had certainly been to make him conclude that the developer had good qualities, but he considered the claims made by the makers to be quite extravagant. On the whole, Mr. Burton doubted if it would oust our old friend pyrogallic acid.

After the ordinary meeting was concluded a special meeting was held, and Messrs. J Johnston and F. Walkinshaw were elected members of Committee. Mr. A. J. Hare was elected Foreign Treasurer.

ABNEY CAMERA CLUB.

AT the meeting on the 21st inst, Mr. A. J. ADKINS gave a demonstration on "Carbon Printing," showing the processes of single and double transfer.

A series of club competitions was arranged for ; the first was for gelatine lantern plates, to be held on March 28th.

On March 7th there will be an exhibition and discussion on "Detective Cameras."

GENRE PICTURES.—Mr. J. Hubert, of Hackney, who has been studying art principles for some time past, has shown us a series of three photographs illustrating incidents described in Longfellow's poem "The Happiest Land," in which four "hale and hearty fellows" by "an alehouse on the Rhine," argue as to the locality of the happy country :—

> And then the landlord's daughter
> Up to heaven raised her hand,
> And said, "Ye may no more contend—
> There lies the happiest land."

At the Royton exhibition these three pictures formed the only entry in the special genre class, but the judges, after due consideration, decided that the pictures were so good that they awarded Mr. Hubert the silver medal, despite the absence of competition.

RECEIVED.—*Fallowfield's Photographic Remembrancer* for quarter ending March. It contains four illustrations of snap shots with the "Facile" hand camera, for the use of which very explicit directions are given. It contains also useful and interesting photographic tit-bits, interspersed among the advertisements of which the paper mainly consists.——*The Art Weekly*, "an independent art newspaper," which, we learn, was to have been called "The Art World," but that the latter title belonged to others. Its object is claimed to be sufficiently set forth upon its title-page.——From *The Photographic Times*, of New York, per the Eastman Dry Plate and Film Company, a calendar for the year 1890, neatly framed, and containing moveable parts,

Answers to Correspondents.

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

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

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

ARTIST (Bangor.)—*Obscuring top lights without blinds.* Papier mineral might do, or tissue paper pasted on ; but if you want a paint for this purpose we should advise you to try the whitest quality of Aspinall's enamel, which dries quickly, and is not affected by light. White lead is not permanent, and zinc white is so slow in drying. Or, try a warm, thin gelatine mixed with zinc white brushed on the glass.

J. C. (Edinburgh.)—*Definition of an "Amateur Photographer."* See reply to P. B. A., last week. A dealer in photographic chemicals and apparatus, who uses his camera habitually for his own pleasure, and makes no profit by the sale of his photographs, is, we think, a *bonâ fide* amateur.

T. S.—Wishes to communicate with IGNORAMUS (post mark Dublin), who sent us an enquiry about collodio-chloride a fortnight ago. By forwarding his name and address to our office, or to Canonbury, he will oblige our Carlisle correspondent.

PHOTARGUS.—*Stained collodion for orthochromatic screens.* Our correspondent finds it difficult to strip tinted collodion films successfully. We would suggest the use of Eastman's rollable celluloid as a foundation, or a plate of mica, if he is not prepared to adopt Captain Abney's plan of applying the stained collodion direct to the back lens. Gelatine skins are not sufficiently tranparent. Or, would a coating of india-rubber in benzol stiffen the collodion up to the point of stripping ?

SAMSON.—*Blue tones in silver prints.* Your complaint that the acetate toning bath works so slowly in giving you the required result may be answered by advising you to use a stronger and *freshly mixed* carbonate or acetate bath ; but you must bear in mind that speed is not always desirable when you look for uniformity of action, and push the toning process to extremities. Prints of this kind will, of course, require more gold than the chocolate shades.

W. MORGAN.—1. *Removal of varnish from old negatives.* There is nothing better than prolonged immersion in two or three changes of methylated spirit, which, in cold weather, may be slightly warmed. Mr. W. T. Wilkinson's manual of photo-lithography and half-tone processes is just now being reprinted. Apply to Messrs. England Bros., 25, Charles Street, Notting Hill, W.

W. W. J. N.—*Robert Hunt's early photographs.* These were shown at the Photographic Exhibition of 1888, and again fully described at page 193 of the YEAR-BOOK. The ferric salt used was ammonio-tartrate (or citrate) of iron, applied as a single wash ; this becomes partially reduced to ferrous salt by exposure to light in the printing frame, and the picture is developed by subsequent treatment with a gold or silver salt, and fixed with hypo. The image being unquestionably composed of reduced silver (or gold) should, if properly washed, be permanent, as our specimens appear to be, and they bear the date of 1852.

ARTISTIC.—It is not clear from your note whether or not you have *read* Mr. H. P. Robinson's article on "Winter Photography for the Artist." You will find that he recommends the use of isochromatic plates for general purposes, and these to be of fairly large size, so as to get foreground details without the necessity of subsequent enlarging. We agree in your estimate of the reproduction of Mr. J. Gale's "Homewards," which is simply superb. For snow pictures, "as a rule choose sunlight," says the author.

E. O. C. (Boston, U.S.A.)—We thank you for the formula of collodion suitable for black-and-white reproductions, and also for your generous offer in the matter of collotype.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1644.—*March* 7, 1890.

CONTENTS.

AN UNSOLVED PROBLEM IN THE HISTORY OF PHOTOGRAPHY.

In historical matter which has been published in these pages during the last four months, it has been made clear that the first publication of Wedgwood's discoveries in photography was made at the Royal Institution in 1802, but the question remains how long before that time Thomas Wedgwood had found out his process. The claim has been advanced that his discoveries were made at least as early as 1799, because a sentence in a letter from James Watt, written in that year, seems possibly to bear reference thereto. In this relation the following paragraph appears in Miss Meteyard's *Group of Englishmen*, London, 1871, page 150:—

"When James Watt visited Etruria in 1799, on business relative to a hand-mill he and Boulton were supplying to the firm, the subject of Thomas Wedgwood's extraordinary discovery seems to have been discussed; and a few days later Watt received a letter (probably a promised one) from Josiah Wedgwood, in which were given the details necessary to experiment. To this Watt replied: 'Dear Sir, I thank you for your directions for the silver pictures, on which, when at home, I shall try some experiments. I was thinking of your mill after I left you, and fear the motion of the spindle is too slow, &c.' *James Watt to Josiah Wedgwood, docketed Hand Mill*, 1799. *Wedgwood MS.S.*'"

Additional examination, however, shows that before that time Thomas Wedgwood was using nitrate of silver at Etruria; at least, such was the case if we assume the accuracy of Miss Meteyard's statements and dates. The silver salt is said by her to have been used in relation to the ornamentation of pottery, and if sometimes applied as sketches for burning-in, Watt might possibly apply to them the term "pictures." Miss Meteyard's statement, given in her *Life of Josiah Wedgwood*, vol. 2, London, 1866, page 585, is:—"To solve some problems connected with light he used silver differently prepared, and his observations thereon led to the invention of what was termed 'silvered ware,' namely, a pattern of dead and burnished silver upon a black earthenware body. We first hear of this ware in February, 1791. *Thomas Wedgwood to Byerley, February*, 1791, *Mayer MS.S.*"

The question therefore is—Did Watt's remark refer to designs for pottery, or to the earliest English photographs?

A few days ago we received a private letter from Mr. Hensleigh Wedgwood on this and other subjects, and, with his permission, now give its contents, as follows:—

"Many thanks for the last NEWS, which completely settles the question. It is clear that Thomas Wedgwood never got beyond the unfixed figure on silver salts in a camera. After 1802 he was in such a wretched state of health as to be quite incapable of research of any kind. If in the nineties he had been capable of producing a true Daguerreotype, it is certain that he would have brought forward that process before the Royal Society, and not the fugitive photographs of 1802. I have no doubt that the silver pictures mentioned by Watt in his letter to my father were the photographs in question. Miss Meteyard's assertions are worth nothing. She could give me no authority for attributing the photographs in her book to Thomas Wedgwood. As a proof of her carelessness and inaccuracy, I may cite her assertion that Thomas Wedgwood bought an estate at *Castle* Flory and lived there for a year. The truth was that the brothers had it in contemplation to purchase an estate at *Combe* Flory, but the plan was never carried into execution, nor did they ever live there at all. No silver pictures were ever made upon earthenware at all."

Possibly some light may be thrown upon the main point at issue by an examination of the documents on which Miss Meteyard founded her statements, to see that she has made no mistakes in dates or facts. Was James Watt engaged in any experiments relating to ceramic art about 1799?

A well-known and popular writer has an article in

the last *Photographic Quarterly*, the title of which pushes Wedgwood's discoveries in photography back to the year 1790, but no evidence is given in support thereof; indeed, the author says in the article, "photography was not discovered during the eighteenth century." The title of his memoir is, "Wedgwood and Davy: What they did for Photography a Hundred Years Ago."

They did nothing for photography a hundred years ago, and Dr. Eder has unearthed evidence that photography was discovered during the eighteenth century, as published recently in these pages.

PHOTOGRAPHY IN BELGIUM.

The *Bulletin* of the *Association Belge de Photographie*, just received, is full of interesting matter, and has for its frontispiece an exquisite specimen of heliogravure by J. Löwy, of Vienna, and some good photo-mechanical prints by M. J. Maes.

At a meeting of the Brussels Section of the Belgium Association, at which Mr. O. Campo occupied the chair, Mr. Van Eechout suggested that the Section should fit up a laboratory for the use of members, and should apply to the city authorities for permission to hold its meetings in the Industrial School, and Mr. W. Janssens undertook to take preliminary steps for the attainment of the object. M. Gèruzet brought under the notice of the meeting his method of taking photographs by means of an explosive magnesium compound consisting of:—

Magnesium powder...	4 parts
Chlorate of potash	6 ,,
Sulphide of antimony	1 part

To obtain diffusion of the light, he, by pneumatic means and the use of spirit flames, fired two small charges of this powder for each exposure, and it was found that there was an appreciable interval between the ignition of the two mixtures; nevertheless, he obtained a good group photograph of the members present. M. Gèruzet would probably find it better to fire the charges by electricity. A dangerous compound, such as that described, should not be kept ready mixed. A few grains only of the powders should be mixed just before use, otherwise a deadly accident may take place at some unexpected moment.

At a meeting of the Ghent Section of the Belgian Association, M. Coupé recommended for the development of lantern slides that the plate should be immersed in a mixture of three parts of a 10 per cent. solution of oxalate of potash with one part of a 10 per cent. solution of bromide of potassium, before the application of the usual iron developer; he said that by this method the high-lights of the image come out absolutely transparent. At this meeting Mr. De Keyzer distributed some platinum prints of a picture which had been much admired at the Exhibition of the Section; it was a view of the banks of the Zwalm, in Flanders.

At the meeting of the Antwerp Section, M. Maes, President of the Belgian Photographic Association, occupied the chair, and he read a report about the work done by this comparatively new Section since its foundation. Three years ago it began with thirteen members; their number has since increased to seventy-two. M. Raymond Storms remarked truly, that much of the prosperity of the Section was due to the devotedness of M. Maes. The President then proposed that the Section should occasionally have demonstrations of ancient photographic processes, practically unknown to most workers who first took up photography in the dry plate era. M. Lunden said that a good way to obtain a matt surface with aristotype paper is to rub a sheet of glass with a solution of green soap (*savon vert*), then gently wash it under a rose tap to get rid of the excess of soap, then apply the print to the glass by means of an india-rubber roller. When dry the print will have a fine matt surface. Mr. Hansen drew attention to a letter from the Minister of Finance, dated November 9th last, saying that positives on glass can enter Belgium duty free, when they are declared as objects of art and collection.

The Ghent Photographic Exhibition, to which allusion has previously been made, was held in the grand salon of the Cercle Artistique. The salon itself, says the *Bulletin*, was coquettishly decorated with dried flowers prepared by M. Schmitz. Mr. Edgar de Keyser was among the exhibitors. M. D'Hoy, a veteran Belgian photographer, exhibited specimens of photo-mechanical printing processes, dating from the time of Fox Talbot down to the present day. Mr. A. Sacrè-Smits exhibited large carbon prints of flowers, reminding the *Bulletin* reviewer, Mr. O. Campo, of a similar type of photographs on view at the Brussels Exhibition in 1883, and exhibited there by an English amateur, "Mr. Stevens, of London."

THE BELGIAN INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

"Because of circumstances beyond its control," the Committee of the Belgian Photographic Association has decided to postpone until 1891 the International Exhibition which it intended to hold in Brussels in August, 1890. The cause of the postponement is said to be the tardiness of the replies of the Belgian Government officials to letters about suitable buildings for the proposed Exhibition.

Mexican Fireflies.—A gentleman travelling from California to Vera Cruz came across millions of fireflies near Jalapa, one of the most beautiful cities in Mexico. He says that the road from this point was lined with a dense chaparral, which was brilliantly illuminated with myriads of fireflies. These are a bug about the size of an ordinary roach, and emit a light almost equal to that of a small wax taper. It is not the occasional sparkle of the little firefly of our country, but a continual blaze, proceeding from the eyes, as well as from two points beneath the wings. Several of these insects, placed in a glass jar, will give sufficient light by which to read the smallest print, and when one rises in the air to any considerable height, it resembles a beautiful meteor slowly crossing the heavens. Numbers of them flying through the air in different directions on a dark night present a very pretty appearance, well calculated to excite the wonder, if not the superstitious fears, of a person unacquainted with the cause of so strange a phenomenon.—*American Druggist.*

SOME RELATIONS BETWEEN FINE ART AND PHOTOGRAPHY.*

BY PHILIP H. NEWMAN.

I SAY "some" advisedly, because I could not, in anything like the time at our disposal, make even a catalogue satisfactorily of all the relations these two subjects bear to one another; so rapid of late years has been the growth and progress of the science which, for good or ill, must affect in some degree every branch of the fine arts in the future. There are doubtless those here who would like, and possibly expect, me to describe and enlarge upon the multiform processes of photogravure, whereby elaborate reproductions of works of fine art have been made in such quantities, and of such quality, as to rival, if not to quite revolutionise, most of the engraving processes. Drawing on wood, for example, seems going the road of lost arts, while chromo-lithography trembles at the advance science is making in the direction of chromo-photography. But however much I may regret I may be disappointing some of my audience in barely noting these important changes, I conceive that my business this evening is with something of greater importance still, namely, with the bearing photography has had, and may be expected to have, not only on the fine art of to-day itself, but upon public taste and criticism, and how that sense of appreciation has been and will be affected in us, without which fine art can have no existence at all, and by which appreciation it has lived and had its being in every period, and thriven under conditions of such exact ratio that its remains constitute for us an intellectual reflex of the ages.

Making due allowance for much exaggeration and the enthusiasm natural to new-born hopes but only partially realised, no one, I suppose, more than myself will acknowledge the many benefits and advantages photography has conferred on the artist, in permanently registering with the rapidity of a flash those effects in nature that are as evanescent in mountain, sea, or cloud; the crisp-cast shadow of the sun-lit snow, the thundering breaker on the storm-lashed beach, or wandering wavelets of a silent strand; the lightning-laden cumulus, the tempest's rack, the myriad-leaved copse, and the bewildering detail of hedgerow and flowering dale: all are brought home to us in light and line, half-tone and shade, in an exactitude no pencil could imitate, and no lifetime be long enough to master. Yet, in acknowledging all this and much more, I am not blinded to the fact that photography is not an unmixed blessing, and that it has exercised, and will exercise, an influence not altogether for good, unless our eyes are opened in time, and a great effort is made to minimise the evil. Should any photographer be here who fears from the foregoing that I am intending to follow any other artist's lead, and run a tilt against the camera, let him be assured I have no such quixotic intention, as I recognise both its stability and its use too well.

But there are photographers and photographers; photographers that are artists, and photographers who never will be artists. Now-a-days, everybody is a photographer, from duchesses downwards, and this increases the danger, because it is in the nature of things that, though photographers be many, artists will always be few. I will go further than this, and say at once there are some people no more to be trusted with a camera than they are to be trusted with a six-shooter; indeed, far less, for he who misused the six-shooter and killed someone, would probably be sorry for it, but those who misuse cameras, and blaze away, pot-shotting—so to speak—anything and everything that turns up, are hardened sinners, and usually very boastful of their enormities. For this reason I look—perhaps with suspicion—upon some recent inventions in photographic apparatus, as offering, by their extreme simplicity, premiums to this sort of people to commit something worse than homicide, for they kill their mother Nature, and glory in the crime. Then there is another class—a class that ought to know, and perhaps does know, better; indeed, its members can often appreciate a work of art when they see one; who, while they are quite able to take a good photograph, will not use their brains when finding a subject, will not bear in mind that detail will never compensate for faulty composition. These people take a view when, if they had simply moved their tripod-stand twenty yards perhaps to right or to left, they might have taken a picture. Here, then, I think is one of the relations of fine art to photography that we may, I hope, profitably talk about to-night, for you know there are those in these highly artistic and æsthetic times who look upon every photograph as a picture. One hears them say: "It must be a picture, you know; it is nature itself, and the detail comes out sharp all over." So like a picture! But absurd as this is, the feeling that prompts this kind of criticism is far wider spread amongst us than we are inclined to allow, and besides affecting photography, from which it has sprung, it has affected fine art in a very marked manner; for while a very great advance must be noted in our drawing and painting, and in the public appreciation of drawing and painting of late years, yet the exhibition of the intellectual qualities of composition and breadth is rarer among us, and not so keenly sought for as it should be by an art loving people; and I have no hesitation whatever in saying that the insidious influence of bad photography has much to answer for in this respect.

There is good cause, then, for us to use our utmost endeavour to guard against the growth of an evil that is likely to bear so seriously upon the art of the future; and where there are so many photographers, the greater reason for the multiplication of critics, and the furtherance of the study of art based on the just contemplation of that of past ages—a study now within the reach of everyone; a study that everyone with any pretension to culture and refinement ought and might make their own. Now I know perfectly well that I shall be met on the very threshold of this argument by the answer, "Oh, don't you think that we have far too many studies already?" Alas! every schoolboy knows that; but with the view of each becoming an admirable Crichton, we do, as a rule, too much of everything, and too little of any one thing to succeed. A bit of Latin, a bit of Greek, a bit of painting, a bit of fiddling, a bit of banjoing, a bit of photography—bits of everything by turns, and nothing long. This is an age of "bits," as regards culture—little "bits," *l'age de morceaux*. One of our most prosperous periodicals is, you know, called *Tit-Bits*. I have no digression to apologise for, as the curse of pretty trifling often follows the photographer into the field, where perforce he goes in for bits—lovely bits forsooth though they be, and full of detail, don't-cher-know. Let me warn him, however, if he indulges much in this sort of thing artistically, he is a lost creature, for he will neglect, and gradually ignore, the higher claims of something greater—the subtle charm of distance midst the rounded hills, the solemn stillness of

* Read February 27th, before the Society for the Encouragement of Fine Art.

the darkening woods, the noble sentiment of landscape, the mystery of light and space. In his hunger for detail his camera so readily gratifies, he is in danger, I repeat, of overlooking the main elements of a grand picture. Pity, indeed, if in this search after ever so enchanting "bits," he and his following become blinded to higher intellectual claims. Surely it were idolatry to worship a goddess at every corner, and forget a uniting and overruling divinity.

From this it will be gathered that I am not of those who think it is in "the very nature of photography to degrade natural appearances"; indeed, it should be known to the merest tyro in the art that where this is the case, the photographer has but himself to blame for having taken his picture with a wrong lens, altering the perspective of the scene, widening his foreground to the sacrifice of his distance. Of course your one-lens man is constantly doing this, and it would seem as though he were often one-eyed, as he does not himself see the distortion. It is, however, when he comes to photograph animals, or the human figure, that these considerations first dawn upon him seriously, especially when he finds a photograph of a horse, for instance, with a head and neck of monstrous dimensions, but with the legs and hind-quarters of a pony. Then, of course, it is admitted that something is wrong somewhere. Only the other day I saw exhibited in the Strand a photograph of this description, certainly not quite so exaggerated, but still defective in proportion, while in all other respects it was really a beautiful work; but it is precisely this beauty that misleads our taste, for, as Pope says:—

> "Vice is a monster of such frightful mien,
> That to be hated needs but to be seen;
> Yet seen too oft, familiar with her face,
> We first endure, then pity, then embrace."

That there are difficulties to overcome to obtain a good photograph goes without saying, and those who cannot, or will not, draw, but rely on the camera as their means of expression in fine art, must be prepared to meet with some disappointment. The camera is a great mannerist in art, and it needs not only very great technical skill, but adaptive artistic capacity of no mean order, to become *facile princeps* with it, and to rise above mannerism; hence the reason why, though photographers are many, really fine photographic pictures are so few.

It has been said that "photography is an operation of chemistry more or less directed by taste." Quite so; this is no disparagement, however, for art of all kinds is brought about by operations, either chemical or mechanical, more or less directed by taste, and it must be admitted that where some of these operations are more difficult of control than others, it simply makes them, when successful, redound the more to the credit of the operator. But we are not now talking so much about the operations as of the taste that directs them. And again, we are face to face with the relation between fine art and photography, for if you set out to take a photograph, unless as a mere topographical memorandum, it is presumably with the idea of obtaining what, for want of a more accurate definition, we term a picture. But to get a picture presupposes a large amount of the artistic faculty, either inborn, or developed by wide education and knowledge of art. The mere use of the camera will not give you what you want, any more than the use, however mechanically excellent, of the pencil. Nature is not art; it must be seen with artistic eyes, or presented by artistic means. Children and naked savages have an advantage over us here: they make nature artistic, because they invest it with their superabundant imagination, untrammelled by the conventions of the artificial and the commonplace. They are the true impressionists, and make a clean sweep of all that detail that we so much require to help our halting fancy. Suppose, for a moment, it were possible to bring back a Viking cruiser, some early hardy Norseman, and give him half an hour's run on the underground railway; if he survived, we know precisely what he would do when he got back to his crags and peaks or native swamp: he would take a deep, deep draught of something; he would free his mind from all considerations of block systems, Westinghouse brakes, and times of trains; he would string his harp as it had ne'er been strung before, and he would sing, until his eyes were bleared and his beard like a waterfall, a saga that, both in artistic truth and poetic intensity, would ring the world through till the crack of doom. Now I do not believe there are many season-ticket holders who could do that. No; as civilization advances, imagination recedes, in many minds "great conjuration," and very "mighty magic" is needed to call up in them the ghost of an idea outside the actual facts of a scene, commonplace or otherwise. This conjuration it is the function and privilege of the artist to supply; he may do it by pen or pencil, chisel or graver, or with the camera to a certain extent, if he choose, but he never can do it at all unless he possess the abracadabra of his art, call it genius, divine afflatus, what you will: merely focussing a view and developing a plate will never succeed in charming a beholder with the result, unless something of this sort has guided the photographer, and been present with him throughout all the operations—that something that you may get a smattering of, at least, in the National Gallery, but which is never learnt in the dark room.

Coleridge has called painting "something between a thought and a thing." I think it would not be amiss if photographers, professional or amateur, would always remember this definition when they focus a view or subject. In these days of perfect appliances, dry plates, and ready-made developers, they are, as a rule, pretty well sure of the "thing" they focus; but how about the thought?

Ladies and gentlemen, the photographers are not all to blame, be they amateurs or professionals. We members of the Society for the Encouragement of the Fine Arts—have we not sinned also? Have we not looked too much for the thing, and gloated over it in our picture exhibitions? Of course we have. Our art training throughout the country is one persistent effort to get the thing, at any rate, and not to trouble much about the thought, leaving it very much to chance, and to come, perhaps, of its own accord. But it does not come. Year after year goes by; the *thing* increases and multiplies, but the *thought*, even when it presents itself at all, is snubbed and passed over for the most part almost as an impertinence.

No, this is not an imaginative, but a localizing age. A writer, in a recent number of the *Athenæum*, instances and comments on this very ably. He says: "Lord Tennyson informed a recent visitor to Farringford that Locksley Hall is no particular hall, and the Moated Grange is no particular grange. But the localizing craze is already busy upon them. So profoundly undramatic is the temper of our times, that a poet is not considered capable of imagining any dramatic action." Had a "Midsummer's

Night's Dream" been written by a contemporary poet, the public would have demanded, and the literary and artistic providers would have provided, a photograph from life of Titania, and an accurate water-colour drawing 'of the bank whereon the wild thyme blows.'"

Let us, then, try and encourage both the "thought and the thing"—the idea and its realization—in future, and, above all, never encourage the *thing* without an adequate proportion of *thought*: we shall then do a great deal to stop reckless pot-shotting in photography. The dry-plate makers will suffer a little, indeed, as they will sell a few thousand dozen less plates each year; but not only will there be a much nearer alliance between Fine Art and photography than there has ever been, but Fine Art itself will be benefitted in every branch, as we shall have the ineffable satisfaction of seeing all picture exhibitions reduced to reasonable proportions, and even sculpture in England may reveal another Galatea. The thing will be inspired with a thought.

In saying thus much on the intellectual side of the question, let me not be considered to ignore what has already been accomplished by photographers and amateurs who have really been artists. An exhibition of the works of the late Mr. O. G. Rejlander, shown in the rooms of the Camera Club, sufficiently indicates, among many failures, many successes in an earnest endeavour and hope to make the camera subserve a very high art ideal indeed; and when we consider that these works were taken under the disadvantages and with the extra labour of the wet or collodion process, we must allow them the greater acknowledgment and praise. At the same time, we cannot help wondering the more, that this higher art ideal has been, so to speak, lost sight of in figure composition, excepting by a few well known names, and this, too, in an age of manipulative simplicity that Rejlander could hardly have dreamt of. All praise, then, to them and he if, ever persevering, they seem to have borne in mind, with Browning, "A man's reach should exceed his grasp, or what's a Heaven for?"

It must always be borne in mind, however, in a materialistic age, that the spread of artistic capacity can never be expected to keep pace with scientific progress, and this has, doubtless, been an obstacle to the higher successes in photographic art; for while there are all manner of aids to scientific research, and the accumulation of scientific fact has contributed to the continuous and progressive excellence in the production of what we have termed the "thing," the thoughtful part of the subject, as we have seen, is a matter of individual effort, and of course of a much slower and laborious cultivation, dependent on a multitude of contributive and, at first sight perhaps, irrelevant studies, besides the divine afflatus, or genius, as it rarely occurs; and where it does not occur, the personal trouble and observation necessary are all the more laborious, before arriving at the most mediocre capacity for compiling or creating the elements that shall stir that something in a spectator which assures him he is in the presence of a work of art.

Now let us see where we are arrived. Firstly, I have endeavoured to show that photography has exercised, and is exercising, for good or ill, an influence on fine art, and that this influence has not been altogether for good in the past, more especially as having occasioned an attention to detail to the prejudice of unity and breadth. Secondly, I express a confident belief that an increasing love of fragmentary studies by photography and painting is tending to narrow the scope of art generally. Thirdly, I insist that, in regard to Coleridge's definition of painting as being "something between a thought and a thing," the *thought* in this country is too often a minus quantity. Moreover, although we have seen that very earnest endeavours have been made from time to time to achieve a very high art ideal indeed with the camera, yet much carelessness and want of training, external to technique, have brought it into artistic disrepute, and made it very productive, in an artistic sense, of bad work. For this reason it behoves us to be more eclectic, not only for the sake of the future of photography, but for the sake of art itself, and it would be well were the photographic societies to offer more prizes for really artistic work, and obtain, where necessary, acknowledged artistic assistance in making the awards.

I have admitted already that the camera has a place among art methods as a means of expression, if photographers choose to make it so. This has been often disputed, and not without great show of reason, and it must be allowed that, while as a means of illustration it is boundless in scope and detail, as a means of expression it is very limited indeed, and can never, in that sense, hold an equal place with brush, pencil, chisel, or graver, implements which, in the nature of things, mostly being moved directly by the artist's hand, in nervous continuity with his brain, express his thoughts more directly. Thus an etching, equal in breadth and light and shade generally with a photograph of the same subject, though the photograph shows an unquestionably greater veracity in detail, the etching will always command our greater interest as being far and away the greater work of art. Another important disadvantage in photography is the inalterability (in general) of the model, susceptible always of modification in other artistic modes of expression.

To show the great appreciation I have for what photography has already done as an assistant to art, I cannot do better now than afford you a few more glimpses of some of my own studies, and those of gentlemen who have kindly lent me some of theirs for the same purpose, not, however, pretending for a moment that they (at least mine) at all adequately illustrate the possibilities the camera may have.

VOCATION OF AN AMATEUR PHOTOGRAPHER.

BY H. POCKLINGTON, F.R.M.S.

The paper defined an amateur photographer as one who practised photography from his love of it. A man did not cease to be an amateur because he chanced to sell a few prints now and then, or become one through photographing for exhibition purposes with the single hope of coming prizes.

The vocation to which an amateur photographer was called consisted:—1st, in following up the line of the history of the relation between amateurs and photography by doing what he could to improve our knowledge of the principles underlying photographic practice, perfecting the technique, and devising new methods; and 2nd, in doing practical work, such as photographing old buildings, historic remains, incidents of daily life, which though of no great interest now, would be excessively valuable to posterity, and especially in photographing carefully year by year those phases of our national life, such as peasant life, which were slowly passing away. In brief, the paper said that the true vocation of an amateur photographer lay in helpfulness.

* Abstract of a paper read at the Yorkshire College, Leeds.

PHOTOGRAPHING THE FORTH BRIDGE.

Last Tuesday the Forth Bridge was opened by the Prince of Wales, and just at the time that this great structure has been completed, the following account of the photographing thereof, written by the editor of *The Journal of the Photographic Society of India*, and published in the Journal, will be of additional interest: —

When at home the other day, I remember being profoundly impressed with the truth of this moral whilst attempting to take within the limits of a 7 by 5 plate some photographs indicative of the colossal proportions of the Forth Bridge.

The resident engineer, Mr. Cooper, had kindly allowed me to photograph the bridge from any part I chose; and no sooner had I landed on one of its enormous piers than my difficulties began. There was no getting far enough away from any part of it. Looking up through the thicket of cross bracings and girders branching out from the gigantic booms, I could see the busy workmen far above me clinging about them like bees. To the naked eye the immensity and grandeur of the noble structure was all present; but when I attempted to focus anything which required much tilting of the camera upwards, the picture on the ground glass became like the stereoscopic puzzle I have been describing, exaggerated and unmeaning. So, wisely refraining from the impossible, I took all I could see from eye level which afforded the chance of a view.

A westerly gale was sweeping the rain clouds down the Firth and screaming through the great bridge on the morning of my visit, rendering it impossible for good photography. But it was my only chance of securing pictures, so, having taken some from the pier level, I was spirited aloft, bag and baggage, in a cage hung from a wire rope, and swiftly deposited on the landing stage at rail level 150 feet high. Here I was conducted by an obliging official to the extreme bed of the cantilever, where the workmen were engaged in adding girder to beam and beam to girder, every day lessening the gulf intervening between the cantilevers. Amidst the hissing of steam cranes, the clanking of the rivetters, the cries of the workmen, and the roaring of the wind, I set up my camera in a sheltered nook to leeward of a huge boom, and, having focussed across the chasm, waited impatiently for a lift in the clouds.

"How would it be," shouted my guide through the temporary fog horn he made of his hands, "were one of the workmen to get out there in the foreground?" pointing to the very outermost cross girder, under which 150ft. below could be seen the muddy water rushing like a mill stream. "A magnificent idea," roared I incredulously in return—"if his life is insured!" Before I could expostulate, he addressed one of the workmen near—"I say, *Wullie*, just slip along that girder a bit, and let the gentleman take your portrait." *Wullie*, who was bolting together a piece of the ironwork, laid down his tools with an "Aye, aye sir," quietly walked out on one of the overhanging beams. Reaching the extreme end, this amateur Blondin then deliberately buttoned up his pea-jacket, and, cramming his peaked cap well down on his head, got astride of the girder, propelling himself with hands and legs right out to the centre. *Wullie* was now exposed to the full force of the wind and rain; but turning his bearded face towards us with a good-humoured smile, he signified his sense of being photographed by stiffening himself into an attitude of muscular rigidity too dreadful to see. However, there was neither time nor opportunity to get him to look less like the girder on which he sat, so, holding up a warning hand, I gave him twenty seconds' exposure, and he was soon back, working away with his tools again. But in my endeavour to pierce the murky atmosphere, this bearded son of Anak is, I regret to say, a mere smudge.

After several attempts at photographing the long vistas of the bridge at rail level I was personally conducted by my obliging companion to the extreme top of the cantilever. To get there we entered a lift similar to the one below, and, on the signal being given, up we went at a great pace, swaying through the keen wind and penetrating rain. I would have given much to have had a good hand camera and a clear day, for the opportunities for pictures on that upward journey, now that the bridge is completed, are gone for ever. On reaching the top, a fresh surprise awaited me. I had been cogitating as to how I could possibly take pictures in such a howling wind, and was astonished to find that I stepped out of the cage into a comparative calm. Here we were with the clouds within arm's length, so to speak. I could hear the wind blowing, and see the rain swishing about. We were in it all, and yet sheltered from it! This phenomenon was presently explained by my companion going to the windward side of the staging, and holding his handkerchief over the rail. There it snapped and wriggled about in a strong upward wind current induced by the obstruction which the structure offered to the blast. This, rushing upwards, formed an invisible arch of shelter over us before speeding on its way. Under this strange refuge and in spite of the rain, I managed to secure some fairly good negatives of the bridge and surrounding country, precious not only for the reminiscences they recall, but also because no photograph, now the bridge is finished, can ever be taken again from its summit.

The painting of this enormous mass of steel is a work the magnitude of which may be faintly estimated from the fact that there are some forty-eight acres of surface to go over with the brush; and parlous besides, seeing the paint has to be applied after the removal of the fixed stagings. Hence the painters have to be raised and lowered on movable stagings hung wherever required. From the summit where I stood, looking down through the forest of framework, I could see the painters no bigger than ants working far below. Here I had pointed out to me the scene of one of the many thrilling incidents attendant on the construction of the Forth Bridge, which I consider appropriate to relate in these pages, seeing the hero of it was a professional photographer, and the story is quite true.

Five painters were painting down one of the colossal booms which radiate from the base of the cantilevers. The stage they were on was suspended near the very top, when, without warning, it suddenly gave way. Three of the poor fellows, long before they reached the bottom, were literally smashed to pieces against the interlacing framework which lay in their way. The other two providentially caught at some of the cross bracings immediately underneath them. There, suspended by their hands, they clung with all the energy of despair. The resident engineer, Mr. Cooper, saw the accident from another part of the bridge, and rushed with others to the rescue. Now, to get at the poor fellows, some of the heavy planking of the overhead staging had to be ripped off. This was done as quickly as a hundred nervous hands could tear it away, and presently, down far underneath, could be seen one

of the men. The other was out of sight, and, to get at him, still another piece of heavy staging had to be cut away. Meanwhile, hasty preparations were made to rescue the one in view; but he, looking up at them, cried out, "Leave me, and save the other man. He is done; I can hold out a bit longer." Thus re-assured, they ran, and lowered down a man with a rope, to which the exhausted painter, on the point of letting go his hold, was securely fastened and hauled up into safety. They then returned and rescued in like manner the brave fellow who had so gallantly risked his life for his comrade. The hero of this adventure was a poor photographer's assistant, called Toddy, who, being out of work, had to accept this perilous painter's work to keep him from starving.

Perhaps the most touching part of the tale was its sequel. Toddy, after this miraculous escape, went to Edinburgh, where he found work in a photographer's studio; but, it having transpired that he had been working on the Forth Bridge, his employer actually turned him into the streets, on the plea that he dared not entertain the services of an artist who had been known to work as a common labourer on the Forth Bridge! Mr. Benjamin Baker, the eminent engineer and designer of the Forth Bridge, has told this story in one of his lectures, and a subscription was being raised for the brave Toddy when I left for India.

PHOTOGRAPHY IN AN AGE OF MOVEMENT.*

BY FRIESE GREENE.

Our age is not only an age of movement, but of movements. None of us who aspire to the keeping pace with the times can afford to be indifferent to photography—it is something which sharpens our intellects, and brings things to our notice whith we are always passing, but never would have noticed but for the knowledge of photography. Besides, there are heaps of things we could never notice—because we never see them—without the aid of photography; so we will call photography an extra bit of sight and an extra bit of intellect, which no doubt it is. And it is not easy to foretell the future of photography offhand, nor yet any other way, so we will keep to the present uneasiness (which is a sure sign of advancement), and dwell upon one or two subjects which are shaping its future.

Now the first is, the interest taken in it by all classes—high, low, rich, and poor; the second is its thrusting its prying eye into everything within the world and, I may say, outside of it too, for it affords the means of depicting the magnitudes and the places of stars which must otherwise have been quite unknown to us. There are still other more marvellous applications which the camera I am about to bring before you this evening, or at least something akin to the camera. It will be able to investigate all the movements of the spider making its web, or a cloud as it forms, and thousands of other things too numerous to mention, because you can take 600 pictures a minute, on one continuous roll of film, by merely turning a handle. When I first saw a roll of paper go through at the rate of ten a second, and stop an instant when each exposure was made, I felt like a child over new toys, though I was as sanguine as possible, notwithstanding that there was a slight feeling within me of doubt if it would really go on doing it. I think my enthusiasm was more than usual over such things. Mr. Mortimer Evans has improved and improved upon it so much that I am positive the results will have a tendency to bring forward a new kind of photography; in fact, it will make an epoch which will be immensely interesting, for the movements of the centipede, the vibrations of the heart, will have to submit to its power of rapid delineation.

Now the next subject I shall connect with this paper, or at least the movement or movements of photography, is the ladies, for they are pushing themselves forward in a marked manner. The interest they take in photography, the patience with which they work, and the amount of pains bestowed by them in the different departments, is something alarming, and we men must look to our laurels when we bring the words comparison and competition into notice, for all advancement is brought within the scope of those two words—two words, I should say, that are shaping a future in photography. The ordinary view held by the majority of people as to the intellectual power of women as compared with men is not very encouraging to the fair sex (still, this is comparatively a bygone notion), whose smaller brain is held to be positive evidence of smaller mind, or of no mind at all. This idea is still cherished by some, though in the face of everything tending to show the opposite it has taken a long time to convince others that women are truly capable of rising to any position above that of slavery, socially and physically. In my opinion it will not be long before we shall be convinced of the fact that women, when given the same intellectual advantages and education as men, will prove intellectually equal. I know it is difficult to realise in the increasing battle for existence that men can be confronted by rivals. An argument may be brought forward that these smaller, delicate beings, with whiter hands and long hair, are physically and therefore mentally incapable of taking an equal place with men in the intellectual world. Well, what they may be I do not know, but I do know this, as regards their intellect in connection with the fascinating art of photography, we shall find a hot competition, and one in which, if we do not help them to win a place, they will win a place for themselves. If you watch closely you can see women's intellect brought into use day by day in connection with photography.

Women, having had greater educational advantages in the last few years, have proved themselves able to appreciate and to bring their refined and cultivated intellect to bear upon the art of photography, and we only want another Mrs. Cameron to set the ball rolling. She was one who was earnest in her work in photography, as her results show. I wish I had some here to-night to bring before you. She was one evidently who knew that true knowledge can but make the learner more humble and more willing to learn. A weakness may hinder, but we must all bear in mind it does not crush mental effort. So let me impress upon you, the members of the Bath Photographic Society, to encourage ladies to join the Society, and, whatever you do, do not ignore their work. Look at it two or three times, compare your ideas with theirs, and you will find you will have soon other ideas cropping up.

Now, a few concluding words to this Society. Can you not begin a museum of photographic relics? and within this museum can you not start a weekly class for young ladies and gentlemen to learn photography, and let some of the members teach them?

* A communication to the Bath Photographic Society.

REACTIONS OF VARIOUS DEVELOPERS.—By L. van Neck.

	Hydroquinone. Dr. Byck's Yellowish crystals.	Pyrogallol. White sublimate.	Pyrocatechin. Greyish.	Hydroquinone. White needles.	Eikonogen. Yellowish crystals.	Resorcine sublimed.	Hydroxylamine hydrochlorate. White crystals.
Taste ...	Sweet; slightly bitter.	Slightly bitter.	Bitter.	Sweet; slightly bitter.	Saline.	Sweet.	Acid.
Solution ...	Colourless.	Colourless, becoming brown.	Colourless, becoming greenish.	Colourless, becoming slightly brownish.	Colourless, turning rapidly dark brown.	Colourless.	Colourless.
Reaction ...	Neutral.	Acid.	Acid.	Neutral.	Neutral.	Neutral.	Very acid.
Action of Heat.	Fusible and volatile.	Fusible and volatile.	Fusible and volatile at 240° C.	Fusible and volatile.	Fixed residue, carbonises and becomes incandescent, leaving a white saline residue.	Fusible and volatile.	Fusible and volatile.
Solution of Ferrous Sulphate.	Nil.	Blue coloration.	Nil, turns green after long standing.	Nil.	Violet colouration.	Nil.	Nil.
Solution of Ferric Chloride.	Nil.	Dark brown colouration, becoming violet with excess of sodium carbonate.	Emerald green, becoming violet with a little sodium carbonate, and red with excess of same salt.	Nil.	Yellowish green, becoming rapidly yellowish brown, and then dirty-brown with sodium carbonate.	Violet blue.	Nil, decolourises the ferric chloride.
Tincture of Iodine.	Decolourises the tincture.	Red-brown colouration.	Nil.	Decolourisation.	Reddish-brown colouration.	Instantaneous decolourisation.	Decolourisation.
Solution of Plumbic Acetate.	Nil.	White precipitate.	White precipitate.	Nil.	White precipitate, turning black.	Nil.	At first nothing; then a precipitate forms.
Solution of Potassium Carbonate.	Yellowish colouration, turning brown in the air.	Yellow, turning blackish brown.	Yellow, becoming brown.	Yellow, turning brown rapidly.	Yellow, turning brown very rapidly on shaking.	Nil.	Nil.
Solution of Silver Nitrate.	After a time a grey precipitate; solution colourless.	Slow reduction to metal; solution brown.	Very slow reduction; solution yellowish.	Slow reduction.	Instantaneous reduction.	Nil.	White precipitate.
Dilute Hydrochloric Acid.	Nil.	Nil.	Violet colouration.	Nil.	Rose coloration in diluted solution, becoming greenish on addition of ammonia.	Nil.	Nil.

These reactions take place in a solution containing ½ per cent. of the developing agent.—*Bulletin Belge.*

TONING WITH METALS OF THE PLATINUM GROUP.

The attempts heretofore made to tone silver prints with platinum have not yielded satisfactory results. In solutions of platinic chloride, the silver image rapidly becomes pale and disappears, for the silver is converted into chloride, and is not replaced by platinum, that metal being simply reduced to platinous chloride. But if a solution of platinous chloride be employed, and, contrary to the requirements of a gold toning bath, this bath be rendered acid with mineral or vegetable acid, the silver prints immersed in it quickly acquire a black tone, passing through intermediate shades of an agreeable purple. Two atoms of silver are then replaced by one of platinum.

Palladium, iridium, and osmium, under the same conditions as the platinum, furnish characteristic tones, and the general method of preparation of the baths appears to be based on the principle that toning by metals of the platinum group must be conducted in acid baths, and the metal must be in the lowest form of combination.

Platinum Toning.—The soluble and very stable chloroplatinites make excellent toning baths. Any of the alkaline chloroplatinites can be employed, the following formula serving as a type :—

Potassium chloroplatinite	1
Sulphuric acid	5
Water	1,000

The sulphuric acid may be replaced by hydrochloric acid, but since the latter renders the chloroplatinites more stable, its quantity should not be greater than 3 in 1,000, or, by organic acids, excepting such as formic, tartaric, or oxalic, which exert a reducing action on the platinum salt, especially under the influence of light.

The toning bath may be prepared directly from platinic chloride by boiling it in the light with an appropriate reducing agent in the exact quantity required to reduce the salt to the platinous condition.

An excellent toning bath may be thus prepared by boiling in a glass flask a mixture of two grams platinic chloride in solution, with one gram sodium neutral tartrate, until the yellow liquid assumes a dull grey colour, then making up the solution to one litre, and adding the proper quantity of acid.

Ruthenium and Osmium.—I have not succeeded in obtaining with ruthenium and osmium other tones than yellow, differing but little from the untoned prints.

Palladium.—A solution containing one gram sodium chloride, two grams palladious chloride, and 200 grams acetic acid to the litre of water, rapidly blackens silver tones, but the paper takes a yellow tint, which, even after bleaching by five per cent. ammonia water, reappears more or less rapidly after fixing, and destroys the value of the prints.

Iridium.—The iridium tone resembles that of gold. The bath may be prepared by dissolving one or two grams of iridium and platinum double chloride in one litre of water, and acidifying as with platinum. Silver prints tone slowly in this bath, but the whites remain pure and hard; some soft, violet tones are obtained.

Osmium.—This metal gives tones quite characteristic. The bath may be made by dissolving one or two grams of ammonia chlorosmite and twenty grams acetic acid in a litre of water. Prints immersed in this bath take first a sienna brown tint; this colour soon becomes modified, first, in the half tones of the image, and changes to a more or less intense sky blue, which affects the whole print. If, instead of allowing the prints to become blue, they are withdrawn from the bath as soon as the blue begins to appear in the whites, a very curious result is obtained after the fixing. Besides the whites of the photograph, two tones are present—a light brown in the deep shadows, and a blue in the half-tones. With mineral acids, the final tone obtained by the use of osmium is not blue, but violet, and this tint appears even in the whites of the print.—*Comptes Rendus.*

A NEW PHOTO-LITHOGRAPHIC TRANSFER PAPER.

This new transfer paper has been used with good results in the Vienna Royal Institute of Photography and Reproduction. A colour is used on it, prepared by Mr. Adalbert Franz, which is put up in foil tubes, like oil colours. The paper carries, as usual, a thin coating of gelatine. The colour is thin and very fatty. Mr. Franz gives the following directions for its preparation :—The sensitising solution is made up of 50 gm. (in winter 60) of bichromate of potash, dissolved in 1,000 gm. of water. After this is completely dissolved, add aqua ammonia until the solution is a bright yellow. The paper is soaked in this solution in a dark room until it is thoroughly impregnated and soft, and then hung up in the same room to dry.

For fine drawings and autotypes, the paper should be squeegeed on to a thoroughly cleaned glass plate; a sheet of waxed tracing cloth or rubber should be laid between the wet paper and the squeegee to avoid rubbing away the former. The exposure should be ample. After exposing, the sheet is fastened on a board with thumb-tacks, and the colour applied as directed below. It should be spread all over the print, very thinly and equally. After about three minutes' immersion in the water the highest reliefs begin to appear, and washing is then continued until all the detail is out, the print finally being laid upon a glass plate and rubbed with a soft sponge or a tuft of cotton-wool until completely developed. Care should be taken that everything is very clean, in order to avoid spotting the whites of the print.

For transfer to zinc the paper must be soaked in a two per cent. solution of alum and washed again. If the colour leaves the print in washing, exposure has been too short. A property of this paper is to be noted—the formation of a hard film on the gelatine in case any of the solutions are too warm, which repels the colour. The sheet may be anchored at the corners by little bits of lead, to prevent its rolling up during development. The colour is squeezed out of its tube in a semi-fluid condition, and is dissolved in a solution, kept ready, of equal parts of benzine and turpentine. Then, with a broad brush or a very soft sponge, it is evenly spread over the print in a thin and equal coating. It should only be used well thinned down with the oils.

Before transferring, the print is laid between sheets of wet blotting-paper until it is soft enough. It should be run through the press under considerable pressure. The colour, it is said, transfers well to zinc, as well as upon stone.—*Photo. Correspondenz.*

Views Wanted.—Mr. R. E. Mack, 24, St. Bride Street, E.C., writes :—"I am wanting some good views of beautiful scenes and landscapes. Could any of your readers recommend one or two really good photographers of these subjects?"

Notes.

A city contemporary is rather behind the times. In referring to some old houses near Crutched Friars, it suggests that these are subjects which the "Society for Photographing Relics of Old London" should interest itself in. This Society has now been extinct some two or three years, as has been regretted more than once in these columns. As for the series of photographs, the result of some years working, we understand, they—or a selection of the most interesting—will shortly be issued to the public in the form of reproductions. The size will be much reduced, and the idea is to form a kind of gift book of an ornamental and tasteful character. Mr. Monks, the secretary of the defunct society, will, we believe, edit the series. With appropriate letterpress well done, the volume should prove very attractive.

Photography, we suppose, has been productive of more verbal quips and cranks than any science one could mention. A pun by Dr. Oliver Wendell Holmes is the latest instance. He used to be an amateur photographer, and whenever he presented a picture to a friend, he wrote on the back of it "Taken by O. W. Holmes and *Sun*." Perhaps the neatest example of word play is that furnished by the late William Brough, who, when shown a photograph of a friend taken by a photographer named Death, exclaimed, "Ah, taken from life, of course!"

Mr. Vicat Cole is painting the Thames from the point of view which fifty years ago or so used to be considered the only one; at least it always figured in the illustrated topographical books of London of the period when steel engravings were most in vogue. We refer to the view as seen from the Observatory Hill, in Greenwich Park. It is rather curious that of late years this singularly picturesque view of London, with St. Paul's as the conspicuously central object, should have been so neglected by photographers. Possibly the reason is that with the enormous steam boat traffic, and the multiplication of factories on the river side, the atmosphere is never free from smoke. This view of London without St. Paul's would be worthless, and it is probable that the times in a year when St. Paul's is visible from the Observatory Hill could be counted on one's fingers. Mr. Cole's experience is, we understand, of this nature. He is anxious to secure an afternoon effect, but though he has visited the place many times, on only two occasions, and then for a very brief space, has he seen the cathedral.

Photography in France still keeps up its character as a political barometer. Those who regarded the escapade of the Duc d'Orleans as the outcome of a boyish impulse must have been somewhat undeceived when they saw the shower of portraits—mostly photographs—with which Paris has been deluged. The inference is that the so-called escapade was the result of a Royalist organization, as these portraits must have taken a long time preparing, and the sudden avalanche can only have had for its object a political demonstration. To anyone ignorant of party tactics the appearance of these photographs might seem an indication of public feeling, but of course it means nothing of the kind.

We have not the slightest objection to supplying our non-photographic contemporaries with information, but we are inclined to raise a protest when our paragraphs are appropriated in wholesale fashion and made to pass as original. In the *Artist*, a sixpenny monthly magazine, for February is a special column headed "Photographic Notes," consisting entirely of unacknowledged paragraphs clipped *nolens volens* from our issue of January 17th.

Jan Van Beers is as lucky over his law suits as he is over his paintings, some of which have made remarkable hits. He was once accused of producing his well-known picture, "La Sirene," by painting over a photographic basis. He brought an action against his slanderer, and won his case. Since then certain art workmen, once in his employ, accused him of signing paintings made by him and others, and selling them as his own. He went to law, but was defeated, one result being that Sedelmeyer, the American art dealer, who exploited Munkacsy's "Christ before Pilate," in the United States, repudiated the contract he had made with Van Beers to allow him the use of his gallery in Paris for an exhibition of his pictures. The artist, however, carried his case to a superior court, and there the judgment of the court below was reversed. On being cleared of the charge of manufacturing spurious "Van Beers," he immediately commenced an action against Sedelmeyer, and has just won the day, the art dealer being compelled to pay damages and costs.

Probably these legal proceedings have prevented the holding in London the usual exhibition of Van Beers' artistic eccentricities and horrors, which had come to be quite a metropolitan institution. Of course it is annoying to be charged with forging one's own productions, but the system of employing others to do the minor details, the characteristic touches being reserved for the master, is by no means an uncommon one. Vandyck, as a writer in the *Times* proved the other day, was really a wholesale manufacturer of portraits. Indeed, in no other plan than by a subdivision of labour could he have executed the enormous number of commissions which flowed in upon him. How much of his own work and how much that of his assistants is to be discovered in his various paintings, only experts can decide; but it may be taken, as a rule, that the arrangement of the figures, the lighting of the hands and face were his, the drapery being left to others. In this respect the system is analogous to that pursued by the busy photographer, who interests himself only in the posing and lighting, his assistant performing the other operations.

PHOTOGRAPHY IN GERMANY.

BY DR. H. W. VOGEL.

Water Lichtdruck Process—Magnesium Flash-Light—Police and Jury—New Magnesium Flash-Light—The Grammophone and Photography—Restoring Yellow Albumen Prints—Yellow Fog on Dry Plates.

In my letter, published December 28th, page 743, I mentioned Husnik's water Lichtdruck process. This process is a curious one. The Lichtdruck process is based upon the principle that a gelatine chromated film becomes insoluble in water by the action of light, but obtains the capability of absorbing fatty ink. If, therefore, a chrome gelatine film is copied under a negative, the parts through which the light can penetrate will absorb fatty ink, whereas the parts on which the light has not acted will not absorb ink. They remain, however, pervious to water, *e.g.*, for water-colours.

If, therefore, a copy has been made under a positive, and the film is rolled with water-colour, this will adhere to the parts which were not acted on by light. This is the principle of the water Lichtdruck process. This has not yet been applied practically as far as I know.

In my last letter I wrote to you about the new magnesium blitz studio. Such a one has now been fitted up at the head quarters of our police to take the portraits of criminals instantaneously. They are taken to this studio, which has the appearance of an ordinary room, and asked to take a seat. Before they are aware of it the proper focus is taken, the magnesium flashes, and their pictures are ready to adorn the album for criminals.

A still more extensive application of photography in the judiciary department is intended to be made.

The many murder cases which have occurred lately point to the necessity of photographing the locality where the murder took place. These photographic pictures are to give not only a true description of the locality, but to reproduce the original position of the corpse, &c., as far as obtainable. They should be made in sufficient numbers to serve at the preliminary investigation as well as during the jury trial, and be handy to judge, jury, experts, and defence. This arrangement would furnish the most correct proof, as such representations would facilitate very much the comprehension of the records and the testimony of witnesses, while otherwise incorrect ideas as to position and locality might often be formed. The photographic pictures seem to be of particular advantage to the jury, who, with their aid, are much better enabled to follow the proceedings. It might, therefore, be recommended to take views of external wounds which are discovered on the corpse for the better understanding of medical experts. If photography is introduced for the purpose above-mentioned, it would have to be applied the same as in railroad accidents and conflagrations. Wherever such a photograph could be handed to the jury, it would simplify the proceedings considerably, as a good many questions might be avoided thereby. The photographic picture would also be of particular advantage in complicated lawsuits.

That the magnesium light is here of importance for views of dark interiors need hardly be questioned. The latest now is the simplifying of the magnesium lamps, so that any common oil lamp can be easily arranged to serve as a magnesium flash-light. This has been accomplished by the "Fulgur" apparatus of Dr. Leonhard. This new flash arrangement is such that it can be attached to any lamp with a chimney, and that here the magnesium is not blown by a cooling forced air-pressure into the lamp in the direction of the escaping gas from the lamp, but, on the contrary, in an opposite direction, and is thrown in by a mechanical appliance. The magnesium is completely burned up with an intense flame; no unburned magnesium powder can fill the air. Black spots on silvered paper are oftentimes caused by the magnesium powder. The arrangement consists of a kind of sling, fastened by means of a spring and pneumatic release, and can be attached to the upper end of any oil lamp or gas burner chimney. If several flashes are to be produced at the same time—in groups, for instance—the several lamps containing the arrangement are connected with tubing and bulb; thus all the lights of a large chandelier can be set off with a single pressure for an instantaneous flash.

The apparatus may remain on the lamp for hours before and after use without the slightest injury. As the burnt magnesium will only adhere to the inside of the chimney as an easily removable dust, one is enabled to take photographs at any time of the day or night in the most luxuriously fitted up salons without the least disturbance to the occupants.

The flashes produced in oil lamps are not so powerful as those from gas burners. Still, two oil lamps are sufficient to produce a single portrait just as good in every respect as one taken by daylight, and they can hardly be distinguished from each other.

It may be mentioned here expressly that it is of no advantage to use too large a quantity of the powder. A few centigrams are sufficient.

To photograph by magnesium light, not too large a room with light walls is the most suitable, saving considerable light in such a place. Portraits of one or two persons can be well exposed with two or three oil lamps or one or two gas lamps, even with a not very rapid objective. Both lamps should be placed on the light side, about $\frac{1}{2}$ m. above the height of the eyes, at a distance of $1\frac{1}{2}$ m. for bust pictures, and for two-thirds or full figures a little further off, so that objective, object, and lamp form an angle of about 45 degrees. The shadow side is lit up by a white screen, to be placed at more or less distance from the object. In this way all light effects can be obtained easily; for instance, by placing the lamp near by, an illumination of plastic effect can be had. An attentive operator can easily regulate the effect of his illumination by the previous picture.

For groups, four or more lamps should be employed, according to the size and condition of the room and the number of persons. They are divided in about the following proportion:—With four lamps—three on the light side, and one on the shadow side, all about $\frac{1}{2}$ m. above the eyes, the distance to be in proportion of how much of the object is to be taken. If the lamps are so placed that no direct light will fall into the objective, then the holder and objective may be opened without the slightest danger of fogging the plate, and, bulb in hand, the suitable moment may be waited for, when the picture is taken. I have observed, oftentimes, how a jovial party was taken at night with this "fulgur" apparatus, using the same lamp that served to light the room. The mirror hanging on the chimney protects the objective from directly penetrating light.

Everybody knows Edison's phonograph. This has now a competitor in the grammophone of Jacob Berliner, which admits the application of photography.

The grammophone reproduces the sound—the human voice as well as music—faithfully, but not always without a disturbing noise. The grammophone is particularly successful in the reproduction of pieces of music of several instruments, which are rendered with an almost faultless expression. In Berliner's grammophone the wax cylinder of the Edison phonograph is replaced by a zinc plate, covered with some protecting coating, into which a point, fastened by a membrane, draws undulating lines corresponding with the vibrations of the membrane, which is set in motion by the undulating sound.

These metal plates are then treated with acids like etchings, and one obtains therewith an imperishable plate, which can be multiplied at pleasure by the galvano-plastic process; yes, it is even possible to make enlarged photographic copies from the original plate, from which new and larger plates of correspondingly stronger sound can be produced. The sound-funnel arrangement of the grammophone, by which the tunes can be so increased that a greater number of people can hear it at the same time, has been more successful than the arrangement with which Edison tried to attain the same effect.

At the last meeting of our Society several questions were asked, which might also be of interest to foreign readers. They are the following:—Is there an effective intensifier for yellow albumen prints, and what is the treatment?

According to Davanne, the picture is removed from the cardboard by soaking in water; it is then plunged into a neutral gold bath with 0·2 to 0·5 chloride of gold and potassium to 100 parts of water, left therein until it has assumed the desired tone, washed in a partly dark room, and is fixed again. We have not obtained very satisfactory results with this method.

How is a heavy yellow fog on the erythrosin bath plate to be removed or to be avoided.

Yellow fog on erythrosin, or erythrosin silver bath plates, has never happened to us. If the pyro developer should be the cause of the yellow fog, it can be removed easily by bathing the plate in aqueous sulphurous acid. A solution of sulphite of soda (10 per cent.), to which is added muriatic acid, or diluted sulphuric acid, until it smells strongly of sulphurous oxide, acts just as well. Another kind of yellow fog, which, if looked at sideways, shows a metallic gloss, forms easily if the developer has been contaminated with fixing soda. The latter dissolves small quantities of bromide of silver, which, being reduced by the developer to metallic silver, settles in the gelatine film. This fog can sometimes be removed from the moist plate by careful rubbing with the fingers, or a cotton tuft. Both kinds of fog appear just as much on ordinary as on colour sensitive plates.—*Anthony's Photographic Bulletin.*

Royal Institution of Great Britain.—The following are among the arrangements for the lectures after Easter:—Louis Fagan, Esq., Assistant Keeper of Prints and Drawings, British Museum—Three lectures on "The Art of Engraving": 1. Line Engraving; 2. Wood Engraving; 3. Mezzotint Engraving; on Tuesdays, May 6, 13, 20. C. V. Boys, Esq., A.R.S.M., F.R.S., M.R.I., Assistant Professor of Physics, Normal School of Science, South Kensington—Three lectures on "The Heat of the Moon and Stars" (the Tyndall lectures); on Thursdays, April 17, 24, May 1. Professor Dewar, M.A., F.R.S., M.R.I., Fullerian Professor of Chemistry, R.I., Jacksonian Professor of Natural Experimental Philosophy, Cambridge—Six lectures on "Flame and Explosives"; on Thursdays, May 8, 15, 22, 29, June 5, 12. Captain W. de W. Abney, R.E., C.B., F.R.S., M.R.I.—Three lectures on "Colour and its Chemical Action"; on Saturdays, April 19, 26, May 3.

PROF. PIAZZI SMYTH ON FIGURES IN PHOTOGRAPHS.

Some time ago we selected some American views, and especially some of natural clouds caught in the White Mountain region, and sent them to our esteemed friend, Prof. C. Piazzi Smyth, the learned astronomer and Egyptologist. His return remarks upon some of them have so interested us that we are impelled to share them with our readers. The learned critic says:—

"And the top one of the parcel (no name) struck me at first speechless in admiration of the clouds, with all the silvery brightness and effective shading they should have in a hand and head painted picture, yet accompanied by trees in the foreground, bright and variously tinted, instead of masses of midnight darkness. Those trees I still admire for those qualities of brightness and illumination, and wonder whether Prof. Vogel's 'orthochromatic' plates could do anything of the kind better, or even so good; but, alas! for the beautiful clouds, and the tops of the hills too, now that I see what I regard as symptoms of their being a printing-in from a second negative of clouds, and clouds alone; taken, too, probably at another place and time.

"Another view, where there is a large, diagonal burst of light coming down from the upper right-hand corner, and forming a central light amongst the clouds, and where the earth part of the view is almost entirely composed of distant aëriform and air-tinted hills, valleys, and plains, and where the dark-green foreground has been, most judiciously, almost entirely cut away, gives a better pictorial representation of earth and sky meeting in a most harmonious embrace of beautiful infinities.

"But what shall I say of the last of the set? A lake and mountain scene, of a larger kind than our Scottish lochs; more like Swiss lakes, but spoilt by that steam yacht lying broadside along parallel to the silvery distance on the water, without any of the beautiful curves which the perspectives of other directions would have given, and all the seven gentlemen on board caring nothing about the grandeur of the scenery, but keeping watch on the photographer to see that he pictures their beautiful physiognomies, little thinking all the time that nobody cares for them when they are indulging in idleness and cultivating vanity!

"This is a maltreatment of the very powers of photography itself, to make it depict what, as a fine art, it must eschew: as bad as the accusation against a Persian king, that he had made the fire, which he worshipped, consume some nasty, stinking stuff—he put it in his way, and the fire-god could not help himself, but was obliged to eat it up.

"It is an unhappy feature, too, in all unartistical minds, whether of the world at large or photographers in particular, which I had hoped the birth of extra-sensitive dry plates, and Kodak, detective, and other instantaneous portable cameras would have been the means of correcting, by furnishing innumerable subjects of figures in action, in their own duties in life, taken unawares to *themselves*.

"I am glad you will soon use the late Mr. Pront's studies to show your readers how figures may be introduced into views, both large and small, so as to add to their interest, instead of causing any real artist to objurgate their unhappy intrusion."—*Wilson's Photographic Magazine.*

At the anniversary meeting of the Institute of Chemistry of Great Britain and Ireland, on the 1st inst., Dr. James Bell was re-elected president.

MORE EXPERIMENTS WITH EIKONOGEN.

BY P. C. DUCHOCHOIS.

Continuing my experiments with eikonogen, I was led to use a more energetic compound to counteract the tendency of this developer to yield flat negatives. It is as follows:—

a. Sodium sulphite, cryst....	20 grains ...	4 grammes
Eikonogen	25 ,, ...	5 grammes*
Water	1 ounce ...	100 cub. cent.
Potassium bromide, 1 : 10	2 drops ...	6 drops

Dissolved by the aid of heat.

b. Sodium sulphite, cryst....	60 grains ...	12 grammes
Potassium carbonate, pure	30 ,, ...	6 ,,
Water	1 ounce ...	100 cub. cent.

These solutions keep well. For use, equal volumes.

In this formula the percentage of sulphite is much larger than that previously given. The reason is that I found the gelatine film liable to be stained yellow by long development. Even a fog, greenish by reflection, pink by transpareney, occurred in one of the experiments made by Dr. Charles Ehrmann. This fog, or better, this dye, was peculiar, being intenser in the great shadows and clear parts of the plate, and melting to yellow in the lights.

Now, as to the capacity of eikonogen. With a view lens 11¼ inches equivalent focus, stop *f*/60, exposure less than one-half of one second, good negatives were obtained on Carbutt's B plates, sensitometer 16, with the above developer. This exposure may be considered as rapid as those by the drop-shutter, when using more rapid plates and the usual *f*/22·617 or *f*/32 stop, according to the subject. The image in these experiments appeared rapidly, requiring from five to six minutes to obtain sufficient intensity.

Carbutt's plates "Keystone special," sensitometer 25, exposed simultaneously with the B, sensitometer 16, developed slowly with potassium pyrogallate, giving, however, good negatives, although they were evidently somewhat under-exposed.

I made only a few instantaneous views, so-called, the persistence of bad weather and the poor quality of light in this season not being favourable. The pictures I obtained —mostly street views—developed much more rapidly with eikonogen than with pyrogallol, and were the best, but none of them were very good. I must say that the days I made them the light was yellowish and variable.

I did not find much difference in the results when treating the plates before development with the preliminary or accelerating bath. I do not deny its usefulness, however, for I did not make special tests for it. I must confess I do not understand its action, mercuric chloride being converted into sulphide by sodium thiosulphate. Perhaps it may be explained by an action similar to that occurring in the curious experiments made years ago by Mr. Carey Lea, which consisted of developing an image in mercury by substituting the nitrate of this metal to that of silver in an acidified pyrogallol developer.

The preliminary bath is compounded thus:—

Sodium thiosulphate (hyposulphite)	5 grains ...	0·2 grammes
Water... ...	25 ounces ...	100 cub. cent.
Bi-chloride of mercury, 1 : 100	30 minims ...	1·2 cub. cent.

* This is the maximum that can be dissolved with the sulphite. By increasing the percentage of the latter, eikonogen, being much less soluble, is precipitated.

The plate is immersed in this for a minute, and then developed without washing.

The following experiments in portraiture were done with the kind collaboration of Dr. Charles Ehrmann:—

Simultaneous exposures were made on Cramer's plate, sensitometer 30, with a Gundlach's rectigraphic lens, 6½ by 8½, stop *f*/15·7, and developed side by side, some with eikonogen, and others with pyrogallol. All the plates yielded good negatives, those developed with pyrogallol being more brilliant than the eikonogen developed plates, which we thought were over-exposed. Therefore, other plates were exposed with stop *f*/22, giving exactly the same time, 2½ seconds, expecting that they would be under-exposed. To our surprise the image came out regularly with eikonogen, while the plates treated with pyrogallol developed slowly, being under-exposed and, consequently, deficient in the shadows.

Theoretically, the increase of exposure between *f*/15·7 and *f*/22 is about twice as long; but we know that in practice it is not so, being much less. One second more exposure would likely have been sufficient to bring out a good portrait with pyrogallol when taking the usual care.

The developers employed in these experiments were compounded by Dr. Ehrmann. They are as follows:—

Ready-made Eikonogen Developer.

Sodium sulphite, cryst....	4 ounces ...	11·3 grammes
Eikonogen	1 ounce ...	2·8 ,,
Potassium carbonate ...	1 ,, ...	2·8 ,,
Water	34 ounces ...	100 cub. cent.

Dissolved by heat.

During the development a few drops of a solution of potassium bromide were added.

Pyrogallol Developer.

a. Sodium sulphite, cryst. ...	4 ounces ...	11·3 grammes
Pyrogallol	1 ounce ...	2·8 ,,
Water	34 ounces ...	100 cub. cent.
b. Sodium carbonate, cryst....	8 ounces ...	22·6 grammes
Potassium carbonate, pure	4 ,, ...	11·3 ,,
Water	34 ,, ...	100 cub. cent.

For use, two drams of *a* and one dram of *b* in one ounce of water, or 24 cub. cent. of *a* and 12 of *b* in 100 cub. cent. of water.

The above results bring me to this question: What is a normal exposure? Under the conditions Dr. Ehrmann and I were working, 2½ seconds with stop *f*/22 was a correct or normal exposure for Cramer's plate, sens. 30, by developing with eikonogen, but a short exposure by developing with pyrogallol. Hence a normal exposure can be defined thus: The minimum of exposure which will yield a perfect image on a given plate developed with a certain developer. But that teaches us nothing about comparative exposures so long as there is not a standard compound for each of the reducing agents employed, and the plate manufacturers do not use the same sensitometer, one graduated something like the United States stops.

The image in all the experiments came out more rapidly with eikonogen than with pyrogallol, but intensity was with the latter more easily obtained.

For over-exposures the development is restrained, as usual, with potassium bromide, using less alkali. Hydroxylamine is said to be an effective restrainer. How can a reducing agent exert a restraining action? It may be so; I did not try it. In cases of short exposures I found it sufficient to use a warm solution—75° F., 19° C. Impressions by drop shutter exposures—stop *f*/22, time $_{2}^{1}{}_{5}''$ —were developed thus by somewhat diluting the developer

with hot water. No frilling occurs with good plates. This manner of operating I found necessary to force out the details, for, as said before, the days I could spare for experimenting were not propitious for rapid exposures, the light being poor. The negatives were weak, and had to be intensified.

The number of plates that can be developed in the same solution depends, of course, upon the subject photographed and the time of exposure, the contrasts increasing gradually with each plate from the accession of more alkaline bromide and the oxidation of eikonogen, which latter diminishes reducing power. The solution, in the meantime, discolours to a greenish tint by reflection, and a yellowish brown by transparency. By adding a small quantity of sodium bisulphite, it clears up to a brownish yellow in a day or two—more rapidly by heating—and deposits a brown substance, which is the dye staining the gelatine film.

The old solution can be used again for the development of over-exposed plates, and to begin that of those normally exposed. For short and even normal exposures, I advise a new solution for each plate, in order to work in the same conditions, which is important to obtain good uniform results; indeed, I never could understand that economy of using the same solution strengthened over and over again, recommended by some authors. That *soi-disant* economy certainly does not compensate the risk of spoiling a negative, or that of obtaining an imperfect one.

As to the compared merit of pyrogallol, hydroquinone, and eikonogen, I will repeat what I have said: each one has properties of its own which the photographer must know how to apply. For myself I do not care whether in time exposures I expose one second more or one second less. What I aim at is to obtain a good negative by being able to control the development at will. Now eikonogen works quite rapidly, brings out the details easily, but in my experience is not so well under control as pyrogallol. For this reason I prefer the latter for time exposures, eikonogen for instantaneous photography, and hydroquinone for diapositives, on account of the colour of reduction.—*The Photographic Times.*

A Cement.—A new cement for securing iron into stone is described in some of the foreign papers. The cement is made by melting resin and stirring in brick-dust, which must be finely ground and sifted, until a sort of putty is formed, which, however, runs easily while hot. In using, the iron is set into the hole in the stone prepared to receive it, and the melted putty poured in until the space is filled; then, if desired, bits of brick previously warmed may be pushed into the mass, and a little of the cement thus saved. As soon as the whole is cool the iron will be firmly held to the stone, and the cement is quite durable and uninjured by the weather; unlike lead and sulphur, it has no injurious effect on the iron.

Cutting Photographic Paper.—Can the following machine be utilised for cutting sheets of photographic paper?—Mr W. Hanlon, of Cohassett, Mass., has obtained a patent, dated November 26th, 1889, for a beheading block and axe. There are five claims; the fifth runs thus:—"5. In an executioner's head-block, the combination, with the body of the block, of a neck-rest composed of parallel uprights and opposing flexible strips secured at their upper ends and bridging the space between them, of a headsman's axe the blade of which is bifurcated and flexibly covered, substantially as described, whereby when brought down upon the neck-rest the forks of said blade will strike upon the posts thereof, and the flexible covering bridge the space between the said posts, and have a yielding contact with the object to be beheaded, substantially as described."

MR. RUSKIN ON "BEAUTY."

Mr. Ruskin's rule for the judgment of beauty is this:—"Any material object which can give us pleasure in the simple contemplation of its outward qualities, without any direct and definite exertion of the intellect, I call in some way, or in some degree, beautiful. Why we receive pleasure from some forms and colours, and not from others, is no more to be asked or answered than why we like sugar, and dislike wormwood. The utmost subtility of investigation will only lead us to ultimate instincts and principles of human nature, for which no farther reason can be given than the simple will of the Deity that we should be so created. We may, indeed, perceive, as far as we are acquainted with His nature, that we have been so constructed as, when in a healthy and cultivated state of mind, to derive pleasure from whatever things are illustrative of that nature; but we do not receive pleasure from them *because* they are illustrative of it, nor from any perception that they are illustrative of it, but instinctively and necessarily, as we derive sensual pleasure from the scent of a rose. On these primary principles of our nature, education and accident operate to an unlimited extent; they may be cultivated or checked, directed or diverted, gifted by right guidance with the most acute and faultless sense, or subjected by neglect to every phase of error and disease. He who has followed up these natural laws of aversion and desire, rendering them more and more authoritative by constant obedience, so as to derive pleasure always from that which God originally intended should give him pleasure, and who derives the greatest possible sum of pleasure from any given object, is a man of taste.

"This, then, is the real meaning of this disputed word. Perfect taste is the faculty of receiving the greatest possible pleasure from those material sources which are attractive to our moral nature in its purity and perfection. He who receives little pleasure from these sources, wants taste; he who receives pleasure from any other sources, has false or bad taste.

"And it is thus that the term 'taste' is to be distinguished from that of 'judgment,' with which it is constantly confounded. Judgment is a general term, expressing definite action of the intellect, and is applicable to every kind of subject which can be submitted to it. There may be judgment of congruity, judgment of truth, judgment of justice, and judgment of difficulty and excellence. But all these exertions of the intellect are totally distinct from taste, properly so-called, which is the instinctive and instant preferring of one material object to another without any obvious reason, except that it is proper to human nature in its perfection to do so."

Celluloid may be mended, it is said, by wetting the edges with glacial acetic acid, and pressing them together for a short time.

A New Test for Albumen.—Salicysulphonic acid has been recommended by Mr. Roch as a certain, delicate, and convenient test for albumen (*Pharm. Centralb.*, September 19th, page 549). The albumen is said to be thrown down by the acid as a white powder, having an acid reaction, and giving with ferric chloride an intense red colour. The separation of albumen from a liquid is stated to be complete, 0·0005 gm. in 10 c.c. being distinctly recognizable. On examining urine, it is recommended to introduce a few crystals of the acid into a cubic centimeter of the liquid, and shake, when the occurrence of turbidity may be taken as evidence of the presence of albumen, since the reaction is not affected by the presence of urea, uric acid, peptones, or glucose.—*Pharm. Journ.*

FLASH POWDER EXPLOSIONS.

BY CHARLES L. MITCHELL, M.D., PHILADELPHIA, PA.

Within the last two years the community of Philadelphia has been startled by a series of fatal accidents, occurring during the manufacture of a compound used in photography, called magnesium flash powder, whereby, in all, five human lives have been lost.

The first accident occurred about two years ago at the drug milling establishment of McIlvaine Brothers, where, while a workman was engaged in grinding this powder in a peculiar form of mill known as a "chaser," the compound suddenly ignited and exploded, burning him fatally. The second accident occurred at the chemical laboratory of Messrs. Wiley and Wallace, some months later. While a lad in their employ, named John D. Cruice, was engaged in sieving this powder, it suddenly burst into a flame, burning him so severely about the face and body that he died within a few hours. The third and last accident, and the most fatal of all, the memory of which is still fresh in the mind of the public, occurred a little more than a month ago, and, singular to note, at the same place where the preceding accident had taken place. In this occurrence three persons lost their lives, Mr. Joseph Wiley, the senior member of the firm, and two of his assistants in the chemical laboratory. While handling some of this flash powder, it suddenly exploded with terrific force, killing them instantly, and badly wrecking the building. This series of lamentable and fatal accidents has served to direct public attention to the subject of "flash powders," and it has revealed dangers attending their manufacture and use which have been but little known and comparatively unsuspected.

Magnesium flash powder is a compound used in photography for the purpose of portraiture at night, and in photographing dark interiors and underground localities, in which, owing to scanty light or even absolute darkness, it has been impossible to obtain an image on the sensitive silver plate.

The introduction of magnesium flash powder as a means of photographic illumination dates back now some three years, when Gædicke, of Berlin, introduced to public notice a compound containing metallic magnesium, which, when ignited, gave a sudden brilliant and intense white light, possessing high actinic properties. Metallic magnesium alone had been used for this purpose for some time previous, being burnt in the form of wire or ribbon; but it was slow, expensive, and uncertain, and was but seldom employed. Gædicke's invention, however, employed the magnesium in the powdered form, and combined it with highly oxygenising substances, such as potassium chlorate and nitrate, for the purpose of increasing the rapidity and intensity of the combustion of the metal. The new compound sprang into immediate and extended favour, for it afforded a convenient and satisfactory means for accomplishing many results hitherto either very difficult or utterly impossible for photographers. The photographic amateur also took hold of it with his accustomed vigour, and all over the land he exercised his skill in "taking" the company assembled at many an entertainment, supper, or ball, while, on more informal occasions, he burnt his own fingers, and astonished his admiring relatives with the sudden and brilliant flashes of the compound in his endeavour to successfully accomplish home portraiture by night. A note of warning was soon sounded, however, and the first fatal accident, occurring during its manufacture, demonstrated that this new compound possessed properties which rendered it under many circumstances extremely dangerous.

Magnesium flash powder, specifically considered, comes under the heading of pyrotechnic compounds. While metallic magnesium will burn by itself when ignited, it does so with but moderate rapidity. It is necessary, therefore, in order to produce the sudden and brilliant flash of white light so desirable for photographic purposes, that the activity and intensity of its combustion be very much increased. The ingredients used for this purpose have been the same as usually enter into the composition of other forms of fireworks, namely, potassium chlorate, nitrate, permanganate or bichromate, amorphous phosphorus, picric acid, sulphur, and antimony sulphide. Gædicke's formula has always been a secret, and consequently those who manufactured flash powder have been obliged to devise formulæ of their own. The composition of these different powders has been kept secret, and it is highly probable that in many cases the ingredients have been combined with but little regard to their chemical properties, and the chemical reactions which might occur from their admixture. The inventor of the particular brand of flash powder which caused the deaths of the five persons previously noted, testified at the coroner's inquest, and subsequently in court, that "he was not a chemist," and the terrible results which accompanied this flash powder, which he had "invented," showed very clearly that it was formulated in utter ignorance of the dangerous properties of its several ingredients.

The chemical composition of many of the different flash powders in the market has been such that the resulting compounds were exceedingly dangerous in character; in fact equally, if not even more so, than gunpowder, or the fulminates, and for this reason: that a flash powder, to meet with the requirements of many photographers, must not only burn rapidly, but must "flash;" that is, the combustion must take place with such rapidity that it must be almost instantaneous in duration of time, so as to avoid the movement of the eyelids, or the changes in expression of the person being photographed. Such combustion must necessarily, for chemical reasons, be exceedingly intense, and to produce this result, chemical agents have to be employed which will liberate oxygen gas freely and in large quantities, so as to supply to the burning metallic magnesium the amount required for rapid and complete incandescence. A compound of this character is a gunpowder to all intents and purposes. When ignited with a match it bursts violently into flame, often with a puff or partial report, showing that its component gases are liberated so quickly as to produce, if the compound were in a confined space, all the effects of an explosion. These compounds are liable from their chemical nature, and from the presence of potassium chlorate, to accidentally explode or ignite under certain conditions, and may, indeed, do so spontaneously, for reasons unkown to chemical science.

The particular make of flash powder which caused the five deaths previously mentioned was known as the "yellow flash powder," or "brutem fulmen," and was manufactured for and sold by the firm of Buchanan, Bromley, and Co., of Philadelphia, general photographic stock merchants. This firm made two kinds of flash powder: the "yellow," which was composed of magnesium, potassium chlorate, picric acid, bichromate potassium, &c.; and the "violet," which was similar in composition,

excepting that the picric acid was omitted. It was claimed that the death of the boy, John D. Cruice, occurred while preparing the "violet" flash powder; but from the fact that the death of Mr. Wiley and his assistants resulted while endeavouring to destroy, some months later, some of this dangerous compound, it is highly probable that it was in reality the "yellow" powder which the boy was engaged in mixing when he met his death. Be that as it may, the combination of ingredients in each of these powders is sufficiently dangerous to render them articles exceedingly unsafe to handle, the most perilous being probably the yellow powder. This powder, as before stated, contained picric acid, magnesium, and the chlorate, nitrate, and bichromate of potassium. No one of these agents would in itself be explosive, except under extraordinary circumstances; but the combination of these different substances introduces at once a large element of danger. It is a well-known chemical fact that many metals, when in a state of fine subdivision, become rapidly oxidized—so rapidly, indeed, that the absorption of the oxygen is attended with both light and heat, particularly if the element of moisture be added. Powdered magnesium and powdered zinc, after being wet with water, have been known to become sufficiently hot to ignite material in contact with them. The admixture, therefore, of any chemical substance rich in oxygen, or holding it loosely in combination, with a readily oxidizable metal like magnesium in a state of fine powder, renders the compound exceedingly susceptible to rapid changes, and certain physical conditions, such as moisture, heat, light, and perhaps electricity, will greatly assist such decomposition. Picric acid, another element in this particular compound, is, when in a pure condition, comparatively safe, as it will burn without danger, and explodes only when heated in a confined space. That of the market is often impure and contaminated with the picrates of sodium or potassium, by-products of its manufacture, thus considerably increasing its dangerous qualities. The salts of picric acid—namely, the picrates of potassium, sodium, ammonium, lead, barium, magnesium, &c.—are extremely dangerous in character, belonging to the class of fulminates or detonators, a series of compounds unstable in character, and liable to explode with slight percussion or friction, with the liberation of immense volumes of gas. Sarrau states that the relative force of picrate of potassium when exploded, as compared with gunpowder, is as 1·98 to 1·00, almost twice as great. A mixture of 0·5 kilograms of potassium picrate and 0·5 kilograms of potassium chlorate evolves through its combustion 352 litres of gas; 1 kilogram of gunpowder evolves but 200 litres under the same circumstances.

(*To be continued*).

Photographic Society of Great Britain.—At the meeting on Tuesday, March 11th, at 5A, Pall Mall East, at 8 p.m., the adjourned discussion will take place on the paper read by Dr. Lindsay Johnson at the annual meeting; and Mr. John Spiller, F.C.S., F.I.C., will read a paper, "Experiments by Dr. Percy and Mr. George Shaw on the Chemical Phenomena of Light."

Photographers' Benevolent Association.—The address of the above has been changed to 65 and 66, Chancery Lane, W.C., and all communications respecting the Association should be forwarded so addressed to the honorary secretary, Mr. H. J. Beasley. We are requested to state that the annual meeting, which was adjourned till the 7th inst., cannot take place on this date, as the Registrar has not passed the new rules.

Notices of Books.

Jahrbuch fur Photographie und Reproductionstechnic fur 1890. Edited by Dr. Joseph M. von Eder. (*Knapp: Halle*).

The appearance of the fourth of Dr. Eder's annuals will be hailed with satisfaction by lovers of photographic science. Germany has become so much the home of original research in photographic matters, that we expect to find in such a work as that before us, which includes articles by so many leading experts, a wealth of original matter carrying our knowledge in several points a step farther than before, and our expectation is not disappointed. A feature of the work, which might be inferred from the title, is the attention which is bestowed upon giving the latest advances in the arts of photographic reproduction by printing-press methods. Amongst others, we find original articles on these matters by Hübl and Jaffe, as well as detailed accounts of processes or methods in use by Volkmer, Strasila, J. G. Albert, Husnik, and Roese, the latter referring to chromo-zincotype.

Amongst the illustrations produced by various photo-ink methods, is one in chromo-lithography, with a set of the tints used, of which there are no less than eighteen, printed underneath. The register has been wonderfully well kept, and the picture is very bright and airy.

There are about a score of these photo-ink illustrations printed by various methods and from different establishments, most of them reaching a high standard of excellence, and possessing a special interest in connection with some photographic process.

One very curious page represents fish—sturgeon and gold fish—swimming in an aquarium, and photographed by the magnesium flash. There are also several which are the work of students—they might very well be the productions of masters—at the Institute for Instruction and Research in Photography and Reproduction Processes in Vienna. A copy of an oil painting which forms one of these supplements, taken with orthochromatic collodion emulsion, is particularly charming in softness and harmony of gradation. Samples of work by the Reporter camera serve to show what really interesting pictures may be obtained in such a small compass, the photographs being only about the size of one-fourth of a quarter-plate, or half that of those recently shown by Mr. Chapman Jones as taken with his Memorandum camera. Such works illustrate the fact that there are optical reasons why that may be done with a small image which it is impossible to obtain relatively sharp with a larger one.

There are some papers of special interest on varnishes for photographic use; on artificial light, particularly various details connected with magnesium flash lamps; and on orthochromatic processes.

We do not pretend in this rapid summary to have exhausted the mention of what is useful and interesting to photographers in Dr. Eder's Annual, and the best advice we can give to those who can avail themselves of the store of information contained in the work is, to get it.

A paper on the perception of luminous radiations by the skin, as exemplified by the blind Proteus of the grottos of Carniola, has been read before the Academy of Sciences by M. Raphael Dubois. By a number of experiments upon *Proteus anguinis*, the author demonstrates that the sensibility of its skin to light is about half of the sensibility of its rudimentary eyes, and further, that this sensibility varies with the colour of the light employed, and is greatest for yellow light.

THE CAMERA CLUB CONFERENCE.

The *Journal of the Camera Club* gives the following full programme of the Conference:—Wednesday, March 19th, 8.30 p.m.—Smoking Concert at the Camera Club Rooms, 21, Bedford Street, W.C. Thursday, March 20th.—Conference and Exhibition of Apparatus at the Society of Arts, 18, John Street, Adelphi, to be opened by the President at 2 p.m. Papers to be read from 2 p.m. to 5.30 p.m. in the Theatre:—1. Capt. W. de W. Abney, C.B., D.C.L., R.E., F.R.S., Presidential Address; 2. Mr. A. M. Rossi, "The Art of Drawing and Photography;" 3. Mr. T. R. Dallmeyer, "Limitations in the Treatment of Subjects by Focus;" 4. Mr. Lyonel Clark, "The Influence of Stops on Exposure;" 5. Mr. A. A. Common, F.R.S., "Eclipse Photography;" 6. Mr. W. T. Wilkinson, "Collotype Practically Illustrated." At 8 p.m.—Exhibition of Lantern Slides in the Theatre. Friday, March 21st, 10 a.m.—Apparatus on view at the Society of Arts, and exhibition of photographs by members at the Club Rooms, 21, Bedford Street. 2 p.m.—Renewal of conference in the Theatre, Society of Arts. Papers to be read from 2 p.m. to 5.30 p.m.:—1. Official communication upon the subject of Regulations for Photographic Exhibitions; 2. Lord Rayleigh, "Photography by the Light of the Electric Spark;" 3. Captain Abney, "A Photographic Untruth;" 4. Mr. C. H. Bothamley, "The Latent Image;" 5. Mr. W. T. Wilkinson, "Photogravure, Practically Illustrated." 7.30 p.m.—Annual club dinner for members and friends at the Frascati Restaurant, Oxford Street (near Tottenham Court Road). All photographers are cordially invited to the Conference and Exhibitions. The meetings (except the smoking concert) will be open to ladies.

Patent Intelligence.

Applications for Letters Patent.

2,916. E. Underwood and T. A. Underwood, 128, Colmore Row, Birmingham, "Detective and other Cameras."—February 24th.

2,920. H. Campbell, 52, Chancery Lane, London, "Flash Lamps."—February 24th.

2,989. W. L. Hare, 7, Bride Court, Fleet Street, London, "Zinc Plates for Printing by Letter Press, and from Copperplates by Intaglio Process."—February 25th.

3,155. F. A. Gregory and H. F. Ainley, 6, Bream's Buildings, Chancery Lane, London, "Camera Slides."—February 27th.

3,203. C. Leigh, 128, High Street, Homerton, "Tinting Opal Glass."—February 28th.

3,281. E. J. Wakeling, 3, Poet's Corner, Westminster, "Displaying Photographs."—March 1st.

3,300. R. Wells, 114, High Street, Kingsland, London, "Frames for Optical Glasses."—March 1st.

Specifications Published.

4,955.—*March 21st*, 1889. "Apparatus for Automatically Operating Valves." Brin's Oxygen Company, Limited, of Connaught Mansions, Westminster, and Kenneth Sutherland Murray, of 21, Redburn Street, Chelsea, London, Engineer.

This invention is intended more particularly for use with apparatus employed in producing oxygen known as the Brin process, but is not restricted thereto, and has for its object to provide means for readily reversing one or several of a series of cocks or valves used in the said process so as to produce suction or pressure as required in a series of pipes with which they are connected without stopping, reversing, or setting in motion any additional machinery. In order to abstract oxygen from the atmosphere by what is commonly known as the Brin process it is necessary to pump or otherwise deliver air through a series of pipes and retorts for a given period. It is then necessary, by means of cocks or valves, to divert the current in pipes and retorts to prevent any further admission of air, to exhaust said pipes and retorts of all air which they contain, and finally, having obtained the required quality of oxygen, to deliver it to a gasholder or other suitable receptacle.

To accomplish this automatically according to this invention it is proposed to utilize the motion of some rotating or reciprocating portion of a pump or any other suitable piece of machinery that may be employed in connection with the process, by means of which motion of rotation is imparted by means of an adjustable pawl and ratchet gearing or equivalent mechanism to a shaft either in a vertical or horizontal plane, as may be most convenient. Connected direct to this shaft, or by means of worm and worm wheel or other suitable gearing, are a series of pairs of adjustable cams arranged to act on back pressure or other valves so as to cause them to admit steam or other motive fluid to a cylinder to exert pressure on a piston, and move it either forward or backward as the case may be.

5,373.—*29th March*, 1889. "Wooden Vessels for Holding Corrosive Substances." Peter Wardlaw Turner, 38, Garturk Street, Crosshill, Glasgow, Merchant.

The separate parts of which the wooden vessel is composed (staves or other pieces) are steeped in a warm solution of melted paraffin wax, which contains enough of a foreign substance or substances to destroy the crystalline nature of the paraffin wax when cool, such as a small quantity of india-rubber or gutta percha, or both together, either of these substances, or both together, being preferable to any others. The wooden pieces, when fully saturated with the mixture, are taken out of the bath and put together to form a liquid-tight vessel, which is then shaken up with a quantity of the liquid mixture so as to form an inside skin for the purpose of further protecting the wooden vessel.

5,920.—*April 6th*, 1889. "Photographic Cameras." Claude Raymond, of 23, Boulevard de Strasbourg, Paris, Merchant.

My invention has reference to photographic cameras of the kind generally called bellows cameras, and it consists in improved means whereby these cameras can be made to expand or contract as required.

For this purpose I fit the camera with two levers or rods crossing each other in the form of the letter X, and jointed together at the middle. One end of each lever is jointed to a pivot, and the other end slides in a grooved guide. For easier manipulation of these levers one or both of the sliding ends is or are preferably fitted with a milled button carrying a pinion which gears with a rack on the guide.

The manner in which my invention can be best carried into effect will depend partly upon the size of the camera. For a small portable camera I would have one pair of the crossing levers at the top and another pair at the bottom of the camera. For a larger camera I would have a pair of crossing levers at each side, and in order to give additional strength and to dispense with the bed portion, a third pair can be placed at the bottom, but without a pinion and rack. The levers of this third pair can be ribbed to make them stronger, and there may be a boss at their crossing point to serve as a foot.

One or other of the side pairs of levers can be more or less extended so as to slightly incline to one side the plate holder or front part of the camera carrying the object glass. The levers can also have screw threaded or extensible parts so as to allow of inclining the plate holder in a vertical direction.

At the meeting of the Society for the Encouragement of Fine Art last week, at which Mr. Newman's paper, printed in this issue, was read, the slides were exhibited by means of one of Messrs. Watson and Sons' lanterns. Mr. Gale, Mr. G. Davison, and Mr. George Smith were among the photographers present.

Proceedings of Societies.

Camera Club.

On Thursday, 27th February, Dr. C. S. Patterson read a paper on "Photography as applied to Medicine and Surgery." Mr. T. Charters White occupied the chair.

The lecturer began by stating the qualities which he considered indispensable in a good medical photographer. He then gave a short resumé of the history and literature of the subject, and going on to its present development, he gave the three great directions in which it was used, viz. (1) as an investigator, (2) as a recorder, (3) as a demonstrator, giving many examples. He then considered it under its various medical departments, illustrated by lantern slides. He said that before a general audience it would be absurd to go into the photographic details of manipulation, but he would like to lay great stress upon two points, isochromatic plates and the magnesium flash lamp, both of which he found almost indispensable. He impressed on the audience, moreover, the important aid they could render to the medical photographer by influencing hospital authorities to give proper facilities for medical application of photography. The paper concluded by a short notice of the way in which this work was now gaining ground.

In the discussion which followed, Messrs. Pringle, Elder, Cooper, Andreae, Dr. Massey, and the Chairman took part.

Thursday, March 13th, will be a lantern evening. Meeting at 8 p.m.

London and Provincial Photographic Association.

At the weekly meeting on the 27th ult. Mr. H. M. Hastings occupied the chair.

Mr. Birt Acres was elected a member of the Association.

Mr. A. Haddon, at the last meeting, suggested a delicate test for grease in water, which he was unable to demonstrate then from the impurities of the water. He had brought a bottle of distilled water to the meeting. The scrapings from a piece of camphor were allowed to fall on the surface of the water, motion being at once imparted to them. By simply drawing the finger across the forehead or face, and then dipping the finger in the water, the particles of camphor instantly ceased to have movement, from the grease imparted by the finger.

Mr. F. P. Cembrano showed a foreign postcard illustrated by photography, under government sanction.

Mr. A. Haddon gave a demonstration of glass-blowing, remarking upon the usefulness of being able to make the various small glass articles required for the dark room and laboratory. The lecturer proceeded to explain the composition and varieties of glass, of which there are four kinds, German glass, soft and hard, ordinary English soda glass, lead glass, and combustion tubing. Of these the best for all ordinary work is the soft German. It is necessary to select that special variety that will stand heating and reheating. By diagrams on the black board the zones of a candle flame were explained, followed by a description of the several blowpipes in use, worked either by the foot, or blown by a tube held in the mouth. Illustrating the manipulation of the blow-pipe, the lecturer commenced by making a simple but indispensable article of dark-room use, a stirring rod. A piece of glass rod of the requisite size was cut, and one end held at the point of the flame, and fused. By revolving the rod at the same time, the end became hemispherical; the other end was then fused and flattened. If the object is simply to bend a piece of glass, an ordinary fishtail or batswing is useful. All that is necessary is to hold the tubing in the flame until sufficiently soft to bend to the required angle. A wash bottle, delivering tube, and pressure guage were then made. A piece of glass tube was taken, one end closed and rounded, and the edges of the other end rounded; this formed a test tube. The sealing of solids and liquids in tubes was next shown. For the latter, a piece of glass tubing is taken, one end closed by fusing, and rounded. This tube is then heated in the centre, and drawn out, the upper part forming a funnel to receive the liquid. To get this into the reservoir below, the bottom part of the tube is held for a short time over a flame, causing the air to expand, the liquid being drawn into the lower tube as it cools. The top part is then broken off, and the neck sealed. To weld two pieces of glass of different diameters together successfully, both pieces of glass should be from the same pot. How to make a T joint, blow a bulb, make a minim glass and bulb pipettes was next shown. The determination of the specific gravity of solutions in use, the lecturer held to be of the greatest importance to photographers. This was easily ascertained. Small glass bulbs are blown, water inserted, the neck fused and sealed, and then adjusted so that they just sink in any liquid of known strength. Ammonia, used in every dark room, was instanced. How was it possible to know its strength after the bottle in which it was kept had been opened, perhaps, as in the case of an amateur, several times? By using a specific gravity bulb, its determination was exceedingly simple. A ten per cent. solution is made up from ammonia of known full strength 880°. A glass bulb is weighted to just sink in the solution. In making up subsequent solutions, the bulb has only to be placed in a measure of water, and ammonia of any unknown strength poured in carefully until the bulb commences to sink; a ten per cent. solution can thus always be guaranteed.

In answer to the question as to the method adopted for creating the vacuum in an incandescent lamp, the lecturer, by a diagram on the blackboard, explained the principle of one of the most effective pumps known for this purpose. A glass tube is bent in the form of a syphon. At the top bend is a stopcock, to which is attached the glass bulb to be exhausted containing the filament. The vertical column is filled with mercury until it rises to the top bend; passing over this it descends by small globules to a receptacle placed to receive it. Each globule as it descends carries with it by its own weight a certain amount of air imprisoned between it and the globule following. By this means a vacuum in the bulb is almost perfectly formed. This is the Sprengel pump, in fact

The demonstration concluding at a late hour, admitted of but little discussion.

Hackney Photographic Society.

This Society held its first exhibition on Thursday last at the Morley Hall. Dr. Roland Smith opened the exhibition, and hoped it would prove of use to those present.

During the evening a "flash-light" group was taken by Mr. J. Hubert with his oxygen blow-through lamp. Among those present were Messrs. J. Traill Taylor, Henry Sturmey, G. J. Clark, and W. L. Beurle.

The members had a good show of apparatus and work, Messrs. Clarke, Hoddle, Houghton, Hubert, Dean, Roder, Gosling, Reynolds, Barton, Acres, W. Fenton Jones, Grant, and others exhibiting.

The professional element was represented in a large exhibition by dealers of apparatus.

West London Photographic Society.

At the last ordinary meeting Mr. G. F. Blackmore occupied the chair. Mr. Roe was elected a member of the Society, and Mr. Wilmer was nominated for election.

After the disposal of the formal business, Mr. Chas. Dixon's paper on "Holland House," was read by Mr. Hodges. Mr. Dixon superintended the exhibition of slides.

The paper was prefaced by a short description of the process employed in the production of the slides. They were, with the exception of a few on chloride dry plates, produced by the wet collodion process by reduction in the camera from 9 by 7 negatives, which also owed their origin to the same wet-plate method. In the case of some of the interiors, exposures of two hours had been given, and the plates were backed with wet blotting paper to keep the films moist. The lecturer then traced the history of the house from the time it first came into the possession of the Holland family in 1600 down to the present time, illustrating his remarks with a large number of interior and exterior views of the house, and of the park and grounds.

Mr. Wilson presented the Society with a number of photo-

graphic works of reference as a nucleus for the formation of the Society's library. After some discussion it was decided to refer the appointment of the Librarian to the Council for further consideration.

On the 14th March, Mr. H. Selby is to read a paper on "Stripping Films."

North Middlesex Photographic Club.

On February 24th Mr. G. Davison delivered a lecture upon "Pictures by Photography," illustrating it by about one hundred photographs taken by himself.

After speaking of the advances that photography had made and the restrictions which it imposed, he proceeded to review what are generally considered the rules of art, and remarked that exceptions to these were almost as much the practice as not, and instanced Mr. Robinson and others, who had taken some of their best pictures with the sun in front of the camera, in direct contradiction to one of the best known rules. Again, another rule was that the horizon line should not be in the centre of the picture; this, and many other rules he referred to, and had one or more pictures to prove that they might sometimes be departed from, and advised that the simplest subjects be chosen—namely, those with as little in them as possible—so that the interest might be centred upon the principal feature, and to endeavour to introduce originality and boldness into their pictures. He then referred to the faults to be avoided and merits to be sought, giving force to his words by a photograph showing each particular feature.

Monday, March 10th, will be members' lantern night. Visitors invited; ladies admitted.

Bristol and West of England Amateur Photographic Association.

On January 3rd a meeting of the Association was held in the Queen's Hotel for the lantern exhibition of slides by various members. In the absence of the president, the proceedings were conducted informally.

Several members were present, including Messrs. W. L. Bernard, J. W. Evens, M. Lavington, F. B. Bond, W. Norgrove, and W. W. Boyden, all of whom exhibited work. Mr. Boyden showed some slides on chloride plates developed with "photopel," the vivid red colour of which is quite a departure from the usual scale of tints.

The annual business meeting for 1890 was held Feb. 7th, when the President, Mr. H. A. H. Daniel, took the chair.

The president, vice-presidents, and secretary and treasurer for the past year were re-elected.

It was agreed that the Secretary be asked to write to Dr. Emerson, thanking him for and accepting his offer of "Life on the Norfolk Broads."

Mr. Brightman was requested to obtain a lantern for the Society's use from Messrs. Perken, Son, and Rayment.

Liverpool Amateur Photographic Association.

A meeting was held on the 27th of February, with Mr. Paul Lange in the chair.

The following were elected members of the Association, viz., Messrs. Hugh R. Jones, M.A., John H. Welsh, H. F. Tildesley, Geoffrey Cather, William Rock, junr., and William T. Bell.

The President announced that letters of resignation had been received from Messrs. T. H. Day and G. H. Rutter as members of the Council, and from Mr. Walter Hughes, the Hon. Secretary, and that Mr. Edward M. Tunstall had been appointed Hon. Secretary. The attention of members was drawn to the extra meeting to be held at the City Hall, Everle Street, on Thursday, March 20th, for which evening a concert was being arranged, to be followed by the President's illustrated lecture on "Norway." The President also announced that the Council had arranged for a series of practical demonstrations in photography for the special benefit of beginners.

The Council had also arranged to exhibit the pictures (sixty in number), 15 by 12, of Mr. H. Tolley, the gold medalist, of Nottingham. These would be on exhibition for a short period in the club rooms. It was hoped they would prove an attraction, as, through the exhibition of Mr. H. P. Robinson's series, thirteen new members had been induced to join the Association.

Mr. T. Sayce submitted a most ingenious hand-camera, made at a very trifling cost, and meeting all the requirements of the amateur photographer.

Other business being concluded, the general public gained admittance, and Mr. D. Lewis gave his paper on "A Fortnight in the Netherlands with a Camera," followed by Mr. W. P. Christian with "Moor and Don, or Studies in Algeria and Spain." Both lectures were illustrated with the lantern.

The Manchester Lantern Competition slides lent to the Association were then exhibited.

Sheffield Camera Club.

The first soirèe in connection with this club was held last evening at the Masonic Hall. Among those who attended were Mr. G. T. W. Newsholme, F.C.S. (president), Dr. T. H. Morton (vice-president), Mr. B. W. Winder, F.C.S., F.R.M.S. (treasurer), Mr. G. E. Malcham (secretary), Dr. Manton, and Mr. Wm. Gilley, junr. A considerable quantity of photographic apparatus was displayed. Messrs. Marion and Co., and R. and J. Beck, of London, contributed lenses, and the Eastman Company furnished some very interesting enlargements.

The President, in the course of a short address, referred to the origin of the Club, and said some of the members when they joined were novices in the art, but others were men of great experience and ability, ready at all times to give advice and valuable help to the recruits. In their Club the professional element did not enter, not that he would say one word in disparagement of the professional photographer; but he felt strongly that a society could not do well which had both the professional and amateur within its ranks. To the amateur photographer was due the credit for the great and rapid advancement of the art of photography during the last few years. Still, although there had been that advancement, the art was now only well advanced in infancy. If such rapid progress had been made in the past, who could predict what its progress would be in the future? Who could measure the great value it must become to the microscopist, the chemist, and the physiologist?

During the evening Mr. Winder, with the aid of a lantern, showed some of the members' slides. A flash-light photograph of a group was also taken by Prof. Arnold.

Bath Photographic Society.

February 25.—Annual meeting; Mr. W. Pumphrey in the chair.

Messrs. Baldwin, Cloakley, Christopher Morris, Charles Terry, and W. S. Wilkins were elected members.

The Treasurer's balance sheet showed a balance in favour of the Society, and in all respects was a most satisfactory one.

The Hon. Secretary and Treasurer, Mr. W. Middleton Ashman, read a carefully prepared and exhaustive report of the Society's proceedings.

The Chairman, in moving the adoption of the account, said the Society had cause to be very well satisfied. The principal expenses would not have to be incurred again; part was met out of the income, and the rest by a loan from officers of the Society.

The election of officers was then proceeded with, and all who served during the past year were unanimously re-elected.

Mr. Greene read a paper entitled "Photography in an Age of Movement" (see page 183). Both the instruments and examples shown were regarded with much interest.

The Secretary exhibited one of the "Collins" detective cameras, and explained the details of working it. The neatness and simplicity of this instrument were remarked upon.

The Chairman then explained the method of producing photo-micrographs. He exhibited a number of specimens and the apparatus used to produce the same.

The leading points requiring attention having been dealt

with, a brief discussion followed, in which Messrs. Ernest Pitman, Greene, and the Secretary took part.

Mr. King, in moving thanks for the papers, spoke of the advantages of such a process for obtaining permanent records in microscopy, and the work could be done of a winter evening. He also referred to the more certain determiuations of astronomers to-day than before photography was employed in their calculations.

There will be a lantern competitiou on March 26th. Slides and particulars of process should be in the hands of the Secretary the day previous.

Photographic Society of Ireland.

A few eveuings ago the members had a practical demonstration given them by Mr. James Carson, C.E. He introduced the subject by showing the utility of the several parts of the lanterns and their accessories, such as gas bottles, valves, and gauge; the differences between the "blow-through" and mixed gas jets; how to properly centre the light for dise illumination; methods of iutroducing slides into the lautern for both single and double lantern exhibitions. Mr. Carson was thanked by the meubers present, and desired to place the matter on paper to be read at some ordinary meeting of the Society.

On March 3rd Mr. J. H. Hargrave, C.E., gave a lecturette on "Lantern Slides, and how to make them." He directed attention to the methods—(*a*) by contact; (*b*) by reduction. In the first class he demonstrated the remarks made by exposing and developing two slides. In the class (*b*) he subuitted a home-made reducing arrangement, by means of which the ordinary camera was brought into play, being fixed on a substantial base-board, and focussed roughly by moving by hand, but finely in the usual manner. The negative was placed at a measured distance from the lens in a slot cut in card-board, and suitably safe-guarded. He gave much information as to his experience with plates by several makers, first dividing these plates into two classes—"chloride" and "bromide." The developing he favoured was "pyro." He devoted time to demonstrate the mounting of slides, and referred to various masks.

Dr. J. Alfred Scott added remarks as to intensification, showing a distinct preference for Monckhoven's. He exhibited a printing frame made by himself for use with quarter-plates in contact lantern plate exposure. It was so constructed as to admit of so much of the lantern plate projecting over any part of the edge of a quarter-plate as might be covered by a mask, wheu it would be advantageous to include or exclude a part of the subject in the quarter-plate as the case might be.

Photographic Club—The subject for discussion on March 12th will be "Stereoscopic Photography;" on March 19th, the adjourned discussion on "Artifical Light as an Adjunct to Daylight," will take place.

On the question of which is best for dark-room windows, paper or coloured glass, it may be said that if a satisfactory coloured glass can be got it is preferable, as the colour of paper is apt to be discharged by the continued action of daylight.—*Photographic Scraps.*

Gold Bath.—Iu au article communicated by E. Kiewning to the Dutch photographic journal *Lux*, there is a notice of what the author holds to be a remarkable receipt for a toning bath which is not liable to deterioration:—

Water	600 grams.
Chlor. gold	4 ,,
Chlor. potass.	60 ,,

After the solution is effected, 20 grs. of chemically pure chalk in the form of powder are added. Let this mixture stand for three or four days protected from the light; the bath is then ready for use. The tones produced by this bath are brown and blue, with all the intermediate tints, according to the concentration and duration of the toning. The abovementioned bath is, says E. Kiewning, of the chiefest importance in the summer, when the temperature is high, and the employment of carbonate of soda in the gold bath is, in consequence of its reduction-accelerating powers, by no means desirable.

Answers to Correspondents.

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

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

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

J. D.—*The Ligroine Lamp* was sent off to you, per L. and N. W. R., on Monday morning. We shall be glad to hear of its safe arrival and successful employment. The Welsbach incandescent cones are easily procurable in this country, and you need not wait long for extra supplies. Wheu using part of the apparatus as a blow-pipe, a special air-jet will be required, and then silver can be easily melted.

M. P. S.—*Council Elections.* There is a mistake somewhere, twenty-one names appearing on the cover of the *Journal*. Your friend was duly nominated, but declined to serve on the council.

A. F. (Warwick).—*Gelatine brands.* Information already given by post; let us hear in the event of your having any further difficulty.

Litho.—*Albert Transfer Paper and Zincography.* It is hardly likely that the new transfer paper would be already procurable in this country. For reversing plant, apply to any optician; all you want is a good plane mirror. For etching troughs use wood, well dried and coated with melted paraffine; glass bottoms would be of no particular advantage. The sensitising bath of—

Bichromate of potash	50 grammes
Water	1,000 c.c.

is equivalent to a five per cent. solution, which you can make by disolving one ounce in a pint of water, if you have not gramme weights and litre measures. Remember to add the ammonia.

L. M. A.—See "Concise Instructions in the Art of Retouching," by Burrows and Colton—Messrs. Marion and Co. Somewhat old, but a very good book, with full descriptions and pair of negatives as frontispiece.

Collodio-Chloride.—There is no reply from Dublin.

F. C. S.—*Inactivity of Developing Solutions in Cold Weather.* We can quite confirm all you say, having tried to work this week at an uncomfortably low temperature. The image preferred to remain latent, and the naphthol developer was far behind pyro in power of development. From our own and Mr. W. K. Burton's comparative experiments, we know that there is no disadvantage of this kind in summer time.

Graphic.—*Photo Waste of the Noble Metals.* There is an error of calculation, or misprint, in the American statement, for on the data given there is an 0 too many. £2,500,000 should read £250,000. Even then it is a big estimate.

The Photographic News.

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Advertisements should be forwarded (prepaid) to Piper and Carter, 5, Furnival Street, Holborn, E.C., to reach the office not later than noon Thursday. A fee of 6d. must be forwarded when the Publishers expected to receive and forwarded replies to Advertisements; and when they undertake the receipt of replies, they must be entrusted with name and address of advertiser, for revelation to applicants, in case they may deem it necessary.

Artis Magnæ Liber X. Magia Catoptrica.

Iconismus XXXIV.

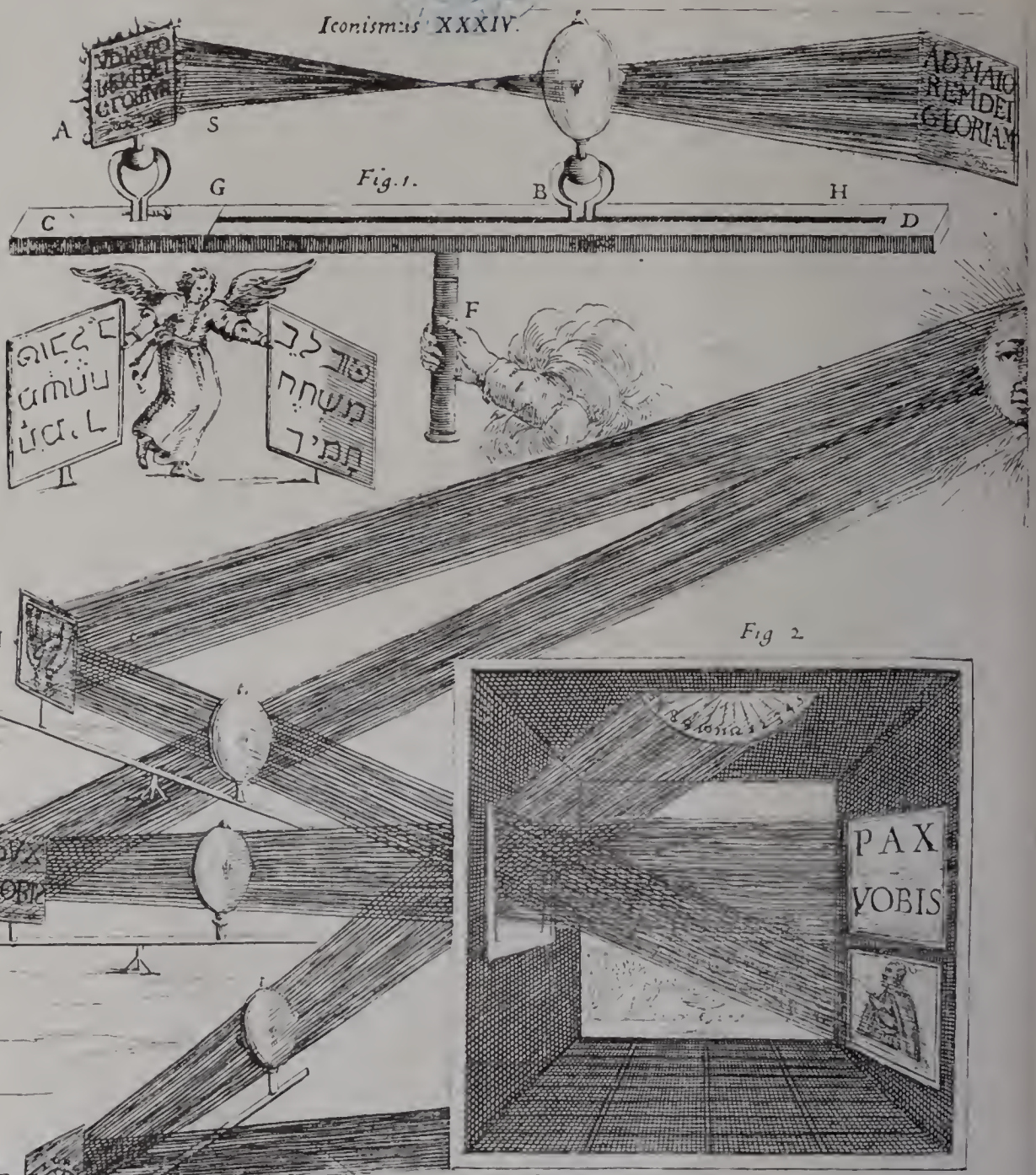


Fig. 1.

Fig 2.

Alphabetum Catoptricum.

Alphabetū inuersum in rectum speculo

A B C D E F G H I K L M N O P Q R S T V X Y Z

Alphab: Hæbræum inuersum in speculo

א ב ג ד ה ו ז ח ט י כ ל מ נ ס ע פ צ ק ר ש ת

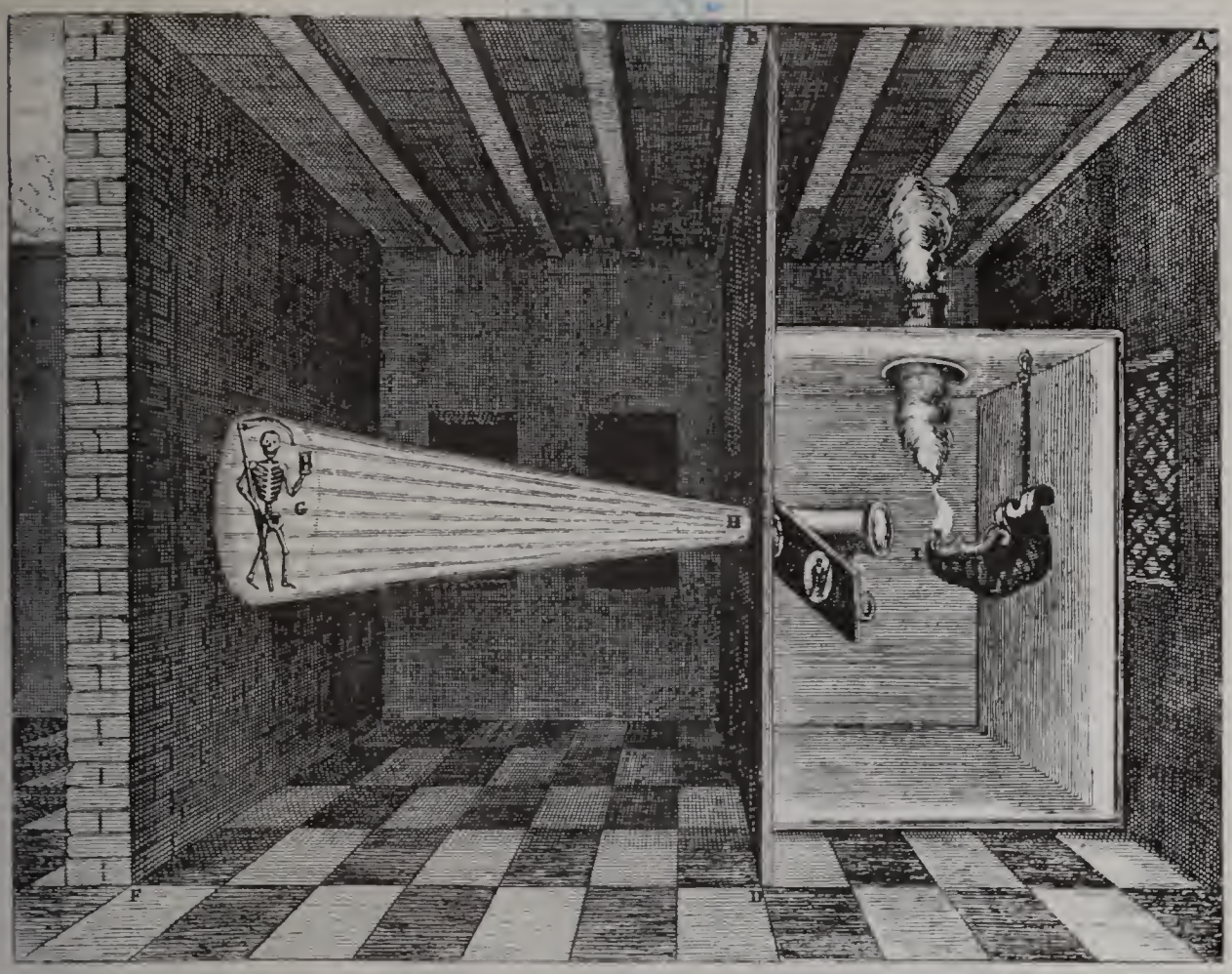
Alphab: Græcū rectū inuersum in speculo

Α Β Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω

THE FIRST MAGIC LANTERNS.

INVENTED BY ATHANASIUS KIRCHER,

Born 1602, Died 1680.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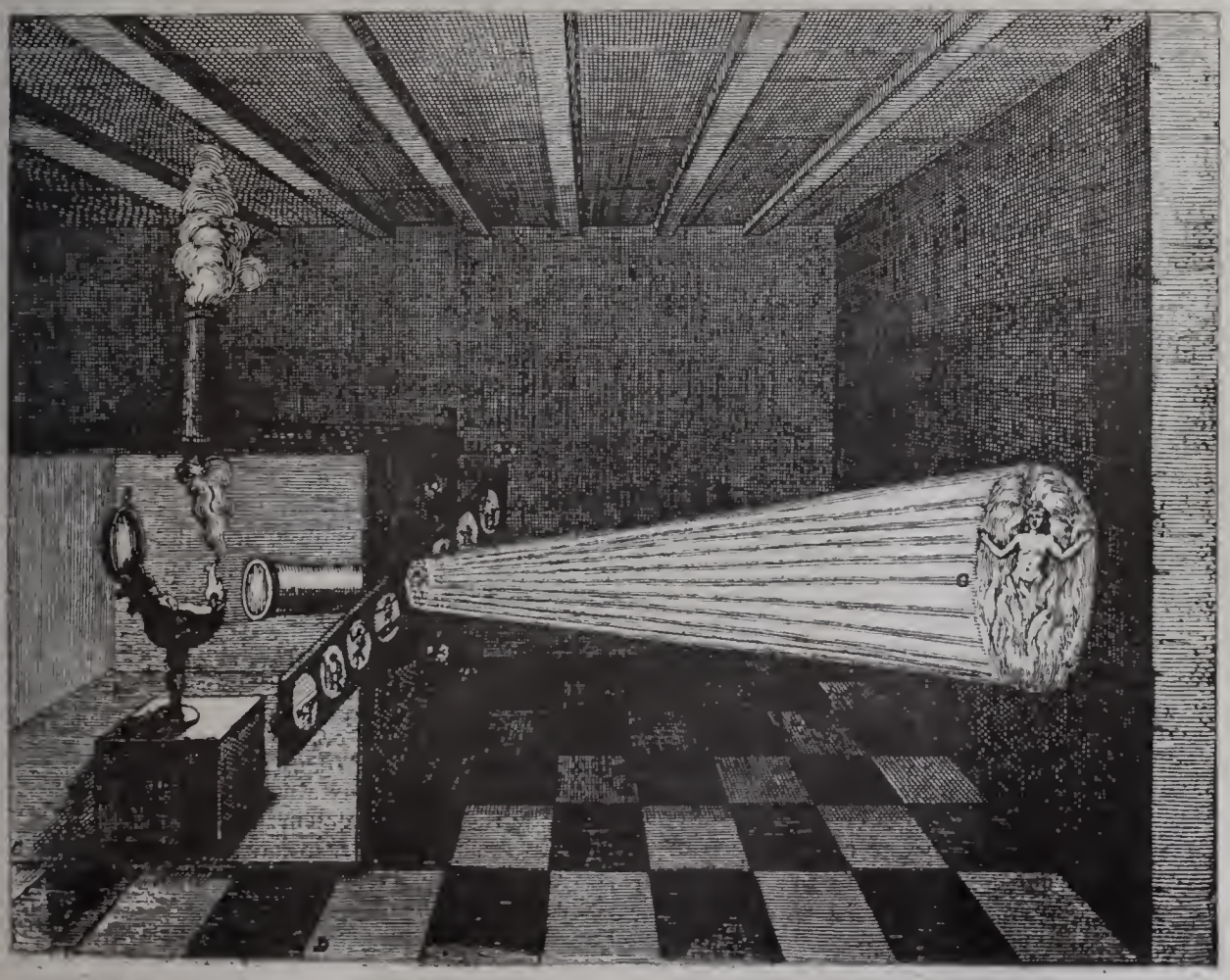
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THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1645.—*March* 14, 1890.

CONTENTS.

THE FIRST OPTICAL LANTERN.

An able article by Mr. James Mew appears in the present issue of this journal, and includes a translation of Kircher's own description of the magic lantern, of which popular instrument he was the inventor. Mr. Pringle, at the Camera Club last week, as will be seen by the report in another column, gave currency to a rumour which had reached him that the magic lantern was first invented, as he put it, by John the Baptist, otherwise Giambatista Porta, the inventor of the camera; but any such claim can probably be sustained only by special pleading, and will not shake the title to the honour, almost universally admitted from time immemorial, to belong to Athanasius Kircher, the good and self-confident Jesuit priest. The truth seems to be that it is not easy in some cases to draw a line of demarcation between the camera and magic lantern; for instance, the largest photozincographic print in our pictorial supplement issued this week represents such a transition instrument, invented by Kircher. The solar beams are received upon pictures or inscriptions painted upon polished plates made of some not readily oxidizable metallic alloy, the composition of which is not on record; then, by means of one double convex lens for each picture, the images are projected on the walls and roof of a darkened chamber. The instrument bears a strong resemblance to a camera, and, at the same time, a strong resemblance to that optical lantern of modern times, in which the image of a brilliantly illuminated inverted opaque object is projected on a screen in a darkened room. Kircher, it will be seen, for use with this instrument, took the trouble to have the letters of the alphabet engraved bottom upwards, and then called them a "catoptric" alphabet, instead of simply telling his readers to take ordinary printed letters and turn them upside down. The other two pictures in the supplement represent a magic lantern beyond all mistake; one of them differs only in principle from the other, being fitted up, Polytechnic Institution fashion, in a second chamber. The pictures prove that Kircher mounted rows of lantern slides in long rectangular frames, as they are mounted and sold in shops at the present day.

Kircher used a reflector behind the oil light, but it was not truly optically centred, if the Italian draughtsman who shared in the production of one of Kircher's blocks can be trusted; probably, however, he cannot be trusted, for throughout the whole of the ponderous old Latin book, there are, occasionally, small discrepancies between the engravings and the letter-press. The position and description of the projecting lens are neither clearly pictured nor clearly described, perhaps intentionally; even in modern times we find inventors sometimes secretive on essential points. Some of the earliest pictures of magic lanterns in old books represent a bull's-eye lens in front of the slide, and a light behind the slide; this, there is little question, was Kircher's arrangement. The first lantern slide pictures of which any information has come down to us were not, it will be seen, of a cheerful nature; the one picture represented Father Time as a skeleton with scythe and hour-glass; the other picture represented one of the units of poor humanity roasting in eternal flames. They took life sadly in those days.

The small cut from Kircher's book, represented on page 198, in Mr. Mew's article, has been by some modern writers mistaken for a drawing by Kircher of the optical system of his lantern, but it is not so. The oval in front is not intended to represent a lens, but a piece of flat glass. The opening behind it is not intended for the passage of a lantern slide, but for the passage of air to the flame. In fact, the cut is meant to represent a lamp for illuminating objects at great distances, by means of a light suitably directed by parabolic or other reflectors.

Lord Rayleigh once said that few persons now-a-days read Newton's "Optics," yet that they are well worth perusal, and contain records of devices which are occasionally re-invented in modern times. The same remark might also be applied to Kircher's "Great Art of Light and Shade."

THE "PHOTOGRAPHIC NEWS" SUPPLEMENT.

With the present number of this journal is issued a pictorial two-page supplement, representing the first magic lantern invented by Kircher, and a transition instrument half-way between an optical lantern and a camera. These are photo-zincographic copies, on a somewhat reduced scale, of Kircher's original engravings, published in Rome in 1646, and in Amsterdam in 1671. The latter seems to be the date of the first printed publication of a description of a true magic lantern.

ATHANASIUS KIRCHER, THE INVENTOR OF THE MAGIC LANTERN.

III.

BY JAMES MEW.

In the third and last part of the tenth and last book of his "Great Art of Light and Shade," Kircher deals, it has been already said in the preceding article, with Catoptric Magic, or the wonderful representations of objects by means of mirrors. Commencing with explanations of the construction of mirrors in their many varieties—such as spherical, cylindrical, and conical—the reader next meets with a series of problems, as Kircher calls them, or propositions concerning the formation of several mechanical instruments. The first of these propositions is how to construct an alembic which, by the sole assistance of burning mirrors, can effect distillation better than by the aid of a fire. The second is how to make a machine which can light a fire on an altar at any given hour, ignite also the holy candles, and, after that, cause a fountain to rise which will turn the sacrificial flame to ashes.

The third problem will be given at full length. Its subject is how to construct an artificial lantern, by means of which any writings may be read at a long distance.

"Let," says the author, "a lantern (see fig. 1) be constructed of the cylindrical figure which is here shown in the picture, in whose base A B there must be set a concave mirror as nearly as possible parabolic, and within the focus of this mirror let there be placed the flame of a candle F, and you will have at once what you desire.

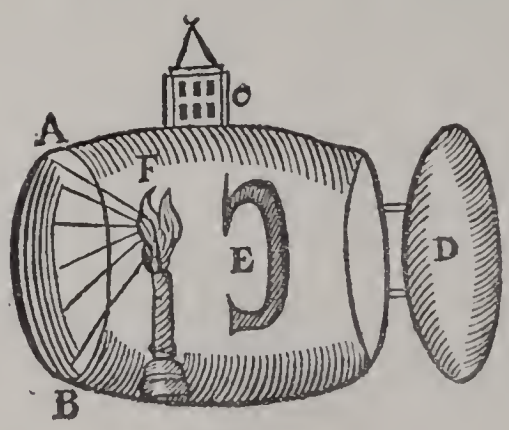

Fig. 1.

"For the light will then shine with such unusual splendour as to show without any difficulty, and by night, even the minutest letters, only to be otherwise seen by the aid of a telescope, while those who behold the flame from a distance will surely suppose it to be a mighty fire. The light will be increased if the interior of the cylinder be formed out of shining tin into an ellipse, but the figure will sufficiently explain the invention. E designates the handle, D the window opening or outlet for the light, and C the chimney."

Kircher, after referring to a chapter in a previous portion of his work, which will be given hereafter, in which an instrument, a peculiar camera, conducive to the birth of the magic lantern, is shown, goes on to say, "Since this singular invention was left by us to be amplified and adorned by other greater inventions, it has happened that many, enticed by the novelty of the matter, applied their minds to its perfection. And among the first of men to do this was a certain Dane—whom Kircher calls, somewhat strangely, Thomas Walgensten—a mathematician of no mean repute, who, after a consideration of my invention described by me as aforesaid, of the magic lantern, effected some improvements therein, and then, to his own great pecuniary advantage, sold it to different men of rank in Italy, so that in a short time the lantern was fairly well known through the whole of Rome. The only difference between this lantern of Walgensten's and my own invention was that the former showed the forms of many objects very clearly in a dark room, to the extreme admiration of the beholders." Kircher, however, also exhibited in his own Jesuit College in a dark room with equal surprise on the part of the spectators. "And it is indeed a thing well worthy of being seen," says Kircher, "when by its aid whole tragic, satiric, or other scenes are exhibited to the life."

The catoptric artifice, previously described, differs from the new lantern only in this, that in the latter case a movable light is called into use, while Kircher utilized the rays of the sun. "Everything that could be shown by the movable lantern was," says Kircher, "shown by me in colours to the life by means of the sun's rays falling on a mirror on which the forms of objects were described, and reflecting them on the wall of an inner chamber; and we also taught in the same place how, without the aid of the sun's rays, to represent objects by a concave mirror or a transparent lens. And," says Kircher, "I enter into these matters the more fully in order to make clear to the reader whence these new mysteries of the lantern have derived their origin, a lantern not undeservedly, in our own opinion, called magic and thaumaturgic, from its wondrous representations of all conceivable objects in a dark-room or in the deep silence of night." And now nothing remains but to explain in a few words the fabrication of this instrument—an instrument which, as the date is important, it is proper to say was not shown to the public in the edition published at Rome in 1646, but first appeared in that published at Amsterdam in 1671, which date, therefore, may be considered that of the birth of the magic lantern.

Let a box (see fig. 2 in supplement) be made of wood, A B C D, with an opening at L for a chimney, through which the smoke of the lantern may pass. Let the lantern K be set in midst, either suspended by a wire or on a stand M, opposite to the aperture at H, in which let a tube be fixed, and at one end of the tube, I, let there be inserted a good lens; at the other end of the tube, at H, let a plane, clear piece of good glass be fixed, on which whatever you choose has been painted in diaphanous water-colours.

This being accomplished in the chamber V X, and on its white wall the light of the lantern passing through the lens will exhibit the image painted on the plain clear glass at H (which must be drawn on the glass upside down), with the right side up, and magnified and expressed with all its different colours to the life. Note, however, that the light of the lantern must be intense, and in order to ensure this, we place the concave steel mirror before the flame, by which means the power of the light will be increased in a wonderful manner.

It remains to explain the manner of multiplying images. Between two boards neatly formed in the shape of a parallelogram let a piece of polished glass be inserted, equal in size to the opening at H; upon this glass let images of whatever kind and number you wish be painted in diaphanous water-colours, as may be seen in the parallelogram M N. This being inserted between the fissures H P, N P

* The letter P is not in the picture, and N seems to have been written for O.

and its pictures moved one after the other to the opening H, will exhibit eight different images upon the wall, whence it is clear that, if you have ready four or five parallelograms of this kind, of which every one gives different images, by help of these you may easily, in a darkened room, show the spectators whatever you will.

The exhibition will affect the beholders with greater wonder if the lantern be placed in a separate chamber, A B C D (see fig. 3 in supplement), and the little tube inserted in the wall B D at the place H, in the manner already mentioned, for then in the adjoining chamber, B E D F, on the opposite wall G, will appear as many images as have been inscribed on the parallelogram—joyful, sad, dreadful, horrible, and, to spectators ignorant of their cause, miraculous—together with such sentences and writings as have been delineated on the glass, all of which the reader will best and most readily understand from the illustration.

In the conclusion of Kircher's "Great Art of Light and Shade," is a short treatise entitled a New Cryptology, a catoptric art by which two friends, being at a distance from one another, may manifest mutually, without any obstacle or inconvenience, their hidden conceptions, and in addition thereto, show their personal presentments reciprocally by a kind of catoptric replication, and exhibit such other matters as they may desire.

This treatise is divided into two parts, of which the one part is concerned with the projection of figures to any distance by means of the sun, the other with catoptric steganography by means of a candle.

It is, says Kircher, in his preface to his new Cryptology, part of the nature of the human intellect to aspire to the attributes of the divinity, and to prosecute their attainment by daring and almost gigantic endeavour. Of these attributes, the two chief are the following, the one to penetrate into the future, and the other to manifest to those who are absent mental conceptions without, it must be understood, the aid of any human medium. Both of these, as they seem at first sight to be far beyond the bounds of natural possibility, deservedly occupy a front place in the ranks of the hidden and the mysterious. With the former, astrology is busied, of which it is unnecessary to speak here; with the latter, steganography; that is to say, the secret means of speaking at a distance. In this art, the author informs us, monarchs of the world have considered themselves especially blessed, having regard to its convenience for ready counsel, and the expeditious dispatch of necessary business. The love of the emperor Maximilian for the abbot Trithemius, at that time the sole proprietor of such a secret, is sufficiently well known.

Our concern here is with Catoptric Steganography, an art, says Kircher, entirely of our own invention, since we remember not to have read anything of the kind in any other author. An admirable art is this, and indeed worthy of the curiosity of kings, an art by which friends at the distance even of three miles may converse together unheard with security and ease. But leaving the wanderings of words, let us come at once, says the author, lest the reader should suppose we are gulling him, to our grand secret. And so we come at once, though Kircher does not, to his second chapter.

Concerning the Mirrors Necessary for Catoptric Steganography.—In Catoptric Steganography, according to the industrious Jesuit, three things are required—a mirror, a mesoptic glass or lens, and a support or stand. The mirror must be plane, not made of glass, nor of steel, but molten of metallic material. In the first place it may not be of glass or crystal, on account of the profundity of the matter rendering the mirror opaque, from which it follows that the reflected ray being refracted in too dense a medium falls upon the wall doubled—an accident which not only renders the characters indecorous, but causes also, amongst them, no insignificant confusion. Steel it may not be, for steel is well known to be impatient of all humidity. And therefore a mirror of the above-mentioned material must not be chosen as the base and foundation of our steganographic operations, for when we proceed to write thereon our mental concepts, such a mirror becomes easily infected and befouled with the juice of the corrosive ink, and will contract rust, and by no means commodiously respond to our design. And so the most suitable of all for our purpose will be a plane mirror molten of metallic material, for this will sustain the ink without any injury, and may also be polished with the least amount of inconvenience.

In the next place will be required a mesoptic glass of a hyperbolic or of a lens-shaped figure; an obtuse section as far as may be, with a diameter of half-a-palm's breadth; and happy may that man consider himself who can attain unto a hyperbolic glass after the fashion of the pupil of his own eye, for he will behold an effect ten times that of a particular lens, and thereby be astonied. The fashion of both of these glasses—the lens-shaped, and the hyperbolic—has been already treated of at considerable length,* and we know that while the hyperbolic can be used for the most remote distances, the lens will only have its effect within a limited radius, and the greater the distance, the greater also must be the hyperbole; and thus much with regard to the glass in general. For the present experiment, an ordinary lens of somewhat obtuse convexity will amply suffice.

In the third place, the support has to be considered. This should be made (see Iconism xxxiv, fig. 1) of an oblong piece of wood C D, having a fissure in its midst G H, within which the mirror A may move. The glass B and the mirror A are so furnished with joints, that they may be fixed in any part or position by versatile craft. F is the foot, or pedestal sustaining the whole machine; and F is of such a size as may be easily set in the valves of a window. This is an instrument which will be found exactly suited to the performance of any work in catoptric steganography, as will, from what follows, more clearly appear.

Of Concave Mirrors.—Concave mirrors may also prove of the greatest service in this experiment, for they increase in a marvellous manner the images of objects, and set them forth in the most perspicuous fashion. But since it is not every one who possesses mirrors of this kind, we rather use plane mirrors which are of more easy attainment. Mirrors made with a section of eighteen degrees have in this art of ours a prodigious effect, and project the shadows of things to a much greater distance. But, says Kircher, I have communicated only to a few skilled friends and acquaintances the art of applying such mirrors.

Kircher's third chapter treats

Of the distances which are required for the projection of the forms of objects.—Since no natural agent can act to an infinite distance, it follows necessarily that it must have a certain and determinate sphere for its activity, the semi-diameter of which sphere may be called the distance of the agent and

* In Book X., Part II., Chapter 8, where the matter, forms, varieties, collocations, and effects of lenses are admirably illustrated and explained.

patient, since within this distance all sensible actions of natural things are concluded. A sphere of this fashion throws off a sensible light, whilst it continually diffuses itself through a mean by uniform propagation, until, when the sensible forms of light at last are lost, it finally ceases in shade, and this sphere extends itself so much the more as the intermediate body more increases the light; but that which increases the light in the greatest degree is a lens in the form of a hyperbola, and others of this kind, as has been already described, arranged in a proportionate degree of distance between the light itself and its boundary. Reflected forms, with which we are here particularly concerned, are allotted a smaller distance than direct forms, which, having been laid down, we have the following problem presented to us.

It is required to know to what distance the reflected forms of objects may be projected. The answer is that since light is multifold, it has also a multifold reflected sphere of its diffusion. The rays of the sun diffuse reflected forms to the greatest distance, a candle less remotely. "I, myself," the author informs us, "have proved that a glass (mirror) of a half palm's size will project the forms of objects to a distance of five hundred feet, so that such forms projected into a dark room can be easily and distinctly interpreted by the bystanders." The plane mirror was, as has been said, of the magnitude of half a palm, the diameter of the round lens of one-third of a palm, and so with a proportional increment of both mirror and glass (lens) the reflected forms of objects may be still further projected in exact accordance with the additional magnitude of mirror and lens.

"Therefore, if the mirror and lens be both of eight palms, I affirm," says Kircher, "that in this case sensible forms of objects may be projected to the distance of twelve thousand feet, nor can this matter admit of the smallest degree of doubt; and this being so, I can imagine nothing more divine. For is it not a paradox, and a matter in the opinion of all incredible, that a man should speak with his friend by means only of a mirror at a distance of three leagues, should exhibit to him any figures he may desire, and send him, if he so choose, a long letter for his perusal? But that these things are as I have said, that mortal alone knows to whom alone in all the world I have communicated this, my secret."

As, however, nothing is altogether perfect in this best of worlds, so even Kircher's steganographic system is attended by some slight inconveniences. Of these the author mentions two only. They are that the forms of the reflected objects are immensely increased—so that, for example, one letter may attain the magnitude of a tower, the other that, in proportion to the distance of the images of the objects, their appearance is weaker; indeed, they wax so feeble that unless the whole room be dark, nothing whatever will be seen. If, therefore, anyone shall be able to hit upon a means by which he may reduce the proportion of these figures when seen at a great distance, and yet at the same time exhibit them clearly, he may congratulate himself on having discovered a secret well worthy of self-glorification, As for me, says Kircher, who am without the necessary leisure for such an undertaking, and destitute of the wealth which it would be likely to consume, I have hitherto failed in bringing the matter to this satisfactory conclusion. But let no man doubt that such a desirable end may be attained by the proper disposition of intermediate concave mirrors. And, concludes Kircher, I think that I have for the nonce sufficiently explained, as it were, in a preface the nature of my secret.

The next chapter—chapter four—is headed,

Of Steganographic Praxis.—We will first teach how to transmit the letters; but before doing so, it is to be noted that nothing can be written by this art of ours save upon the walls of some shady and obscure place. In a manifest light no reflected ray can be well perceived, and so neither the forms of inscriptions reflected from a mirror; but wherever a place is somewhat dark, the shadows of objects may be perceived, and they will appear with so much the more exquisiteness and minuteness as the place in which they are represented is more shady or more obscure. Whosoever therefore will desire to practise himself in this matter, before all things it is necessary (see Iconism xxxiv., figure 1), that he should inscribe with common ink, and upon a plane mirror A, whatsoever he would have appear in reflection. But since the letters he employs cannot be portrayed in their ordinary fashion, and have their erect natural and proper position upon the plane mirror, we have thought it right to append to this article an alphabet constructed as it must necessarily be to procure for him the result required. And we trust that by means of the use thereof every stumbling block which may offend him in his first essay will be wholly removed out of his path.

The letters must be inscribed on the mirror in the position in which they appear in the Latin alphabet displayed in the adjoined Iconism.

In the present Iconism we have displayed the alphabets of three tongues—Hebrew, Greek, and Latin. In these different alphabets, the upper series of every alphabet is that which is natural. The lower series represents the same alphabet written inversely, or turned upside down and the letters are to be inscribed on the mirror in the fashion in which they are here represented.

This then is to be the position of the characters in which we must write what we wish to express upon the mirror for then they will appear in their right order and position projected upon the distant wall. Suppose you are desirous to communicate a matter to a friend at an appointed hour, you will first inscribe the matter on the plane mirror in the conceived words, in letters upside down, as here are shown. Let, for instance, your communication to your friend written on the mirror be conceived in the following words:—

AD MAJOREM DEI GLORIAM.

You will write these words in the manner displayed on the mirror AS.

The words PAX VOBIS should (see Iconism xxxiv figure 2) be inscribed so that they may appear as on the plane mirror V. The figures to be projected are also to be drawn upside down, as is clearly shown in the mirrors R and N.

After the inscription of the letters in the manner indicated, the plane mirror must be continually turned about until the reflected ray falls exactly on the dark place whereon the letters are to appear. If the reflected ray cannot be seen on account of the distance, the visual ray following the path of the reflected ray, will quickly demonstrate the line of steganographic direction. The incidence of the reflected ray having been determined by this artifice, a lens must next be interposed between the mirror and the dark place or terminus in such a manner that the reflected light may cover the whole superficies

the glass. The lens must also be set in an exactly proportioned distance, which distance must be beforehand determined by observation—that is to say, by approximating or elongating the glass (lens) from the mirror, until the reflected forms of the letters appear as distinctly as may be in the position desired. And after all this has been achieved, there will be beheld within the walls of the room, if the terminus be of that nature, the whole of your concept projected, not without the astonishment of those who gaze thereon, in letters a foot and a half in magnitude, so that the whole wall of the room will be occupied therewith. for these letters will appear so much the larger as the space is more distant between the mirror and the terminus.

It is also here to be noted, that, by some unexplained artifice of Nature, the master-painter, the letters will be seen depicted with every variety of colour, which matter, as it is indeed unusual, will work the greater admiration in the minds of those who behold it.

The figure on the left-hand side of the Iconism, representing the popular idea of an angel, bears a tablet containing a Hebrew quotation, a little misspelt, from Proverbs xv. 15, which is, being translated in the English version, "He that is of a merry heart hath a continual feast."

Kircher's fifth chapter treats of the projection of figures. This is virtually the same as that of the letters. It is written, he says, in the Book of Magic, that Solomon, to inspire awe in his subjects, exhibited his figure in places from which he was himself far away. Many interpret this as a fiction of the Rabbis, but by the catoptric art, an image of oneself may be projected to a distance as easily as that of any other person. It is necessary only to draw the extreme lineaments, commonly called the profile. But experience will teach here more than many words. By Catoptrics may be explained marvellous matters in history, hitherto supposed to be the works of devils. Roger Bachon, as Kircher spells his name, was, owing to his knowledge of catoptrics, considered a necromancer.

Chapter VI. deals with coloured images. The only point of variation in the directions for producing them is, that the figure desired to be projected must be painted in transparent colours. The result is so extraordinary, that many calling themselves acute philosophers accused more than once the unhappy Kircher of dealing with the black art.

In the seventh chapter Kircher explains how motion may be communicated to his catoptric semblances. Profiles must be cut out in paper, and legs, arms, feet, hands, and head are to be attached by joints, so that they may be moved by means of strings. The bodies must be fastened by glue to the surface of the mirror. Then the shadows will be seen to move on the wall to the trepidation of all beholders. If you wish to represent flies, you must smear the edges of the mirror with honey, and you will see flies like giants crawling upon the wall. These attached to steel will follow a magnet moved behind the mirror in any direction desired.

Chapter VIII. contains the mechanism of a steganographic horologe, with which it is unnecessary to trouble the reader.

A short Second Part deals with steganographic catoptries by means of a candle. Here the praxis is the same, but the mirror different. It should be, says Kircher, of an obtuse section of eighteen degrees, or parabolic, with a lens-shaped tube in the form of an hyperbola, proportioned to the concavity of the mirror. The fantasms produced in this manner are much more formidable, and with this machine an impious man may, by means of devils described upon the mirrors, be easily restrained from the perpetration of atrocities.

Another method of presenting images by a candle is to write upon the convex superficies of a glass sphere having as large a diameter as may conveniently be gotten. Behind the sphere is set a burning torch. Images are obtained in this way more deftly, with greater certainty, and at a farther distance than by the use of the concave mirror. "But," says the author, "to leave others some room for their experiments, and to prevent our work growing to an excessive size, we willingly break off the thread of our machinations, mindful of that of Menander—

Ο σοφὸς πυλλὰ ὀλίγοις τοῖς λόγοις.

RULES FOR PHOTOGRAPHIC EXHIBITIONS.

Last week the programme of the papers to be read at the Camera Club Conference was published in these pages. It is proposed to have a discussion upon the regulations for photographic exhibitions, at the Conference, at the Society of Arts, on Friday next, with Captain W. de W. Abney in the chair.

The Club has informed a large number of photographic societies that in continuation of the Conference upon this subject, held at the Camera Club in 1888, and in view of the special interest attaching to the question at the present time, it is felt to be advisable to gather together as many views as possible upon certain leading points in exhibition regulations, with the ultimate object of removing some of the disadvantages which are generally held to attend the systems now in vogue. At the Camera Club Conference the Camera Club will bring forward a set of regulations and recommendations as a basis for discussion.

It is believed that there are at least some few points of reform upon which all who are accustomed to exhibit, or are called upon to manage exhibitions, are agreed. Much good would accrue if these conditions could be settled with some definiteness, and be adopted by the leading societies.

The following are set out as points on which there appears to be fair general agreement; upon these and all the submissions criticism is desired:—1. That exhibition authorities and societies should decline prizes placed at their disposal for the purposes of advertising. 2. That some restriction as to the number of awards is required; suggest a basis for a limitation. 3. That awards should be all of equal value. 4. That if any farther division than Art and Scientific Sections be required, the classification be of the simplest—say, *in the Art Sections:* (*a*) landscape and landscape with figure; (*b*) figure subjects; (*c*) portraiture; (*d*) architectural.

Other points upon which agreement is desirable are as follows:—1. Selection and constitution of Board of Judges for Art and Scientific Sections. 2. Announcement of judges' names as early as possible, and before entries are due. 3. The working of the system of champion classes. 4. Exhibition in competition of work by a firm, in which work several hands have had a share. 5. An intimation in the regulations that the judges are *requested* to withhold awards in cases of insufficient merit in a class or classes.

Other points:—Retouching? One picture, one frame? Diplomas or medals? Separate amateur and professional classes? Hanging committee?

Since the foregoing was in type, we have received the following communication on the same subject from Mr. Ralph W. Robinson :—

"A very able and interesting article, by Mr. G. Davison, in a contemporary, deals sensibly, I think, with the present degraded state of photographic exhibitions.

"As Mr. Davison suggests, it is time that exhibitors should speak with no uncertain voice their opinions in the matter. It appears there was once a time when it was an honour to receive an award; but now, alas! on how few of the medals scattered about with such profusion can the photographer with common sense honestly set any value. As trade advertisements, perhaps they are useful as a guarantee that the recipient has obtained a certain degree of proficiency, but to those who really know the state of affairs, what are they? The very badness of design and inferiority of workmanship of many of them are a slight on the artistic perception of the recipient, or an only too faithful testimonial to the want of taste on the part of those responsible for their issue. How long, I wonder, will the long-suffering exhibitor continue to enter his pictures for competition and allow them to be adjudicated upon by journalists and others, however eminent in their own profession, unless—which is rarely the case—they have the education and experience necessary for the true art critic? The deliberations of the Camera Club next week should do good in giving us the carefully considered views of the amateurs. Have not the leading professionals, too, something to say? It should be possible, I think—so self-evident is the undignified state into which exhibitions have fallen—for a combination to be brought about, of the principal exhibitors, to protest against present abuses. If only a dozen or twenty of the most representative men would make up their minds to united action, and refuse to exhibit, except where men of acknowledged ability as artists, either in painting or photography, will be judges, the exhibition committees would soon see the advisability and, indeed, necessity of reform.

"For my own part I would willingly see medals abolished entirely, and only the best of the photographs sent in hung. Of course, the proportion rejected would depend on the quality of work, and space at the disposal of the committee, but the standard should be a high one; and I think Mr. Davison goes under rather than over the mark, when he suggests the rejection of forty per cent. I most emphatically agree with Mr. Davison that there should be no division between professional and amateur, and no classification except into art and science divisions, and perhaps a technical division should be added to include all photographs not shown as works of art, or as of a scientific character. Most interiors, photographs of machinery, *copies* of paintings and other works of art, and similar subjects, would be included in this division. With regard to the fusion of amateur and professional classes, I believe it is fallacious to argue, as some do, that it is unfair to the amateur to make him compete on equal terms with the professional. On the contrary, the professional has many disadvantages, except in portraiture. He must attend to business for the greater part of his time—which many amateurs need not do—and can devote his leisure only to art study. I believe, too, that it has been an invariable result of the mixture of commercialism and art that one or the other has had to suffer.

"I would suggest that instead of awarding medals, the judges should weed out all inferior work and reject it, and from the photographs exhibited select a few of the very best, to be purchased by the Society holding the exhibition, to form a permanent collection, to the lasting honour of the producer, an encouragement to do good work, and, as time goes on, to form invaluable historical records of the art progress of photography."

CHROMO-PHOTOGRAPHY IN THE PRINTING PRESS.

In our notice of Dr. Eder's annual in last week's issue we had occasion to refer to one of the supplements or illustrations with which it is enriched, an illustration printed in coloured inks, and resembling in all respects a bright and airy sketch in water colours. The fact of producing a coloured illustration by means of selecting portions of a negative for printing each with a separate tint, or in some parts with several tints overlaid on the same part is, of course, not new; but when any particularly striking production is seen, there are naturally enough enquiries as to the means by which it has been accomplished, and as in the subject of the present notice, the process is one which is scarcely known in this country, some details of it may be interesting to our readers.

We gather from the annual containing the illustration, and from other sources, that the plates employed by Messrs. Wezel and Naumann, of Leipzig, are prepared as follows :—Lithographic stone is partly dissolved and partly reduced to a pulp by digestion in hydrochloric and sulphuric acids. To this pulp is added a mixture of solution of asphaltum and resin and a small quantity of oil. By this means a mixture of fatty or resinous salts of lime and sulphate of lime is formed. After evaporating the excess of acid a dilute solution of soda is added, and warm zinc plates are covered with a fine spray of the mixture. The plate thus coated with a film of artificial lithostone, is afterwards treated in the same way as an ordinary lithographic stone, except that in place of nitric or hydrochloric acid, phosphoric acid mixed with dilute gum arabic is employed.

Plates thus prepared have yielded as many as 6,000 impressions, and we learn that the process is used to the almost entire exclusion of other processes by Messrs Wezel and Naumann, who have over thirty steam presses doing various lithographic work.

As the film of stone is thin it is recommended to avoid as much as possible having to make corrections. If, however, any are necessary, the place is washed with turpentine, and is then lightly rubbed with pumice powder and water. When dry it is again lightly rubbed with dry pumice powder, care being taken not to lay the zinc bare.

If any correction has to be made after etching, a solution of citric acid, of about one-third strength of that used for stone, is employed, and the spot may then be worked upon again. Dirty corners or patches are best rubbed away with oxalic acid. If by any mischance a place has been laid bare on the zinc it is treated with gallic or tannic acid.

The process as described, it will be seen, is applicable to all lithographic work. In the example before us, the registering of the different plates is so perfectly performed that we cannot detect any fault in that respect, and the total result is the production of a charming chromo-lithograph from a photographic negative.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Electro-Chemical Etching Process for Hard Metals—Retouching Negatives—Developers for Flashlight Negatives—Fixing with Magnesium Chloride.

Electro-Chemical Etching Process.—For the production of photo-mechanical blocks, zinc plates are almost exclusively used to receive the transferred image, which is etched into them by means of acids. This process has been very much perfected of late, as it is well known; but where harder metals have been tried for the same purpose, it has always been found exceedingly difficult to etch them as cleanly as required for the various photo-mechanical printing processes. To attain the desired effect, it was necessary to use very strong etching solutions, which attacked the metal unequally, destroyed the fine lines, and produced rough edges. This is now obviated by a new patented "electro-chemical hard metal etching process," which is worked commercially by a trading company at Berlin under the firm of "Electrochemische Graviranstalt." The advantages of this process consist in the fact that it is not only possible to readily work hard metals useless for the ordinary etching process, but that also very good etchings may be produced on curved or cylindrical surfaces. A short description of the *modus operandi* of this establishment may be interesting to some of your readers. The etching is done in a stoneware trough; the etching fluid is a diluted solution of an acid, rendered a good conductor of electricity. For the production of the electrical current a dynamo machine of about 200 ampères is used. The hard metal plate is first well polished, and then the transfer is made on it. The latter is dusted with resin powder in the ordinary way. The surplus of the powder is first wiped off and blown away, and then the rest of it, adhering to the lines and surfaces of the transfer, is melted. This is done by placing the plate on a roasting iron and heating it by means of a Bunsen's burner until, by an evenly black colour of the transferred impression, it is evident that the whole of the remaining resin powder has been melted. The metal plate, the back of which has been protected by asphalt varnish, is now placed in the bath, the composition of which is a different one according to the metallic alloy used. As an electrode on the one hand the hard metal plate itself is used: on the other hand a carbon plate is arranged parallel to the metal plate. The surface of the hard metal plate is of course directed to the counter-plate. If the circuit be now completed, the unprotected spaces of the metal are attacked by influence of electro-chemical decomposition. Where the metal plate dips in the liquid, small bubbles arise, and on the plate bubbles appear, forming a whitish scum. If after a short time the plate is removed, it will be found covered on the unprotected parts with a whitish mass, *i.e.*, a metallic compound. If the latter is rinsed off under the tap, it will be observed that the pure metal is already bitten-in to the thickness of a sheet of paper. As in the case of ordinary zinc etching, the plate is removed from time to time, dried, re-inked with fatty ink, dusted with resin, and the latter melted superficially. After the electrolytic etching process is finished, the asphalt film is removed from the back and the edges of the plate, and the latter made ready for use by sawing, filing, and cutting.

Retouching Negatives from Lead-Pencil Drawings.—The following method has been devised, and is a thoroughly certain and excellent one, by an experienced retoucher, Mr. H. Lenhard. It will be of special value to those retouchers who work in collotype and zincography, as they have in hand many lead-pencil drawings. To make the rendering of such a drawing true to nature, and upon a purely white ground, the following method should be used. Zinc-white, finely rubbed down with water—to which some albumen or gum solution is added, in order to insure to the colour a certain degree of permanence—is applied to the varnished film of the negative, which may be either a wet collodion plate, or a gelatine dry plate, and the colour is spread by means of two badger-hair brushes (so-called dabbers) by even strokes downward and from right to left, or *vice versa*, so as to form an entirely equal and well-covering layer over the varnish film. After drying, the negative is placed on the retouching desk, and a mirror is placed beneath it, in order to enable the retoucher at work to see the most delicate lines of the drawing, and by means of a pointed wooden pencil (beech-wood), the drawing is touched up in all its lines. By this means every line becomes uncovered and remains sharp, whilst the ground retains its full covering power. Of course the printer must treat such negatives delicately, because the zinc-white film is easily damaged by rubbing. The laying on of the covering ground requires some practice.

Developers for Flashlight Negatives.—We learn from the *Wochenblatt* that Professor Eder, in his new book, "Photography by Magnesium Light," recommends the following developers for flash-light pictures:—

1.—*Pyro Developer.*

A.—Sodium sulphite	... ...	100 grammes
Pyro	... ...	11 ,,
Water	... ...	500 c.c.
Concentrated sulphuric acid	...	6 drops
B.—Cryst. soda	... ...	50 grammes
Water	... ...	500 c.c.

Just before use, not sooner, 20 c.c. of solution A and 20 c.c. of solution B are mixed with 20 c.c. of water.

2.—*Hydroquinone Developer.*

A.—Hydroquinone	... ...	10 grammes
Sodium sulphite	... ...	40 ,,
Water	... ...	400 c.c.
B.—Potassium carbonate	... ...	20 grammes
Water	... ...	20 ,,

Before development 20 c.c. of solution A are mixed with 20 c.c. of solution B. This developer can be used repeatedly, and it is recommended to add a small quantity of fresh developer, but not before the development has been nearly finished.

Fixing with Magnesium Chloride.—Magnesium chloride ($Mg\ Cl_2$), which, as the older operators will remember, served as a useful addition to the collodion, by which the vigour of the negative was increased, and the solarisation of the sky prevented, has of late been tried by Herr R. E. Liesegang as a fixing agent for gelatino-chloride paper. This experimenter found that prints on this paper were completely fixed if treated with a diluted solution of this salt, and that they were not at all reduced in vigour, as is the case with hypo, ammonia, and sulphocyanide of ammonia. The fixed prints kept well; but as the gelatine of the film is slightly attacked by the salt, it is advisable to add a small quantity of alum to the bath. "Perhaps," says the author, "the magnesium chloride, on account of these properties, can be used for fixing photographs in natural colours."

Notes.

The latest photographic curiosity is the rhombohedral camera of Professor Cohn, of Breslau, by which a picture can be taken while the eye is regarding it in the glass screen. This is effected in the following way:—Two rhombohedra of glass are placed in a special chamber just behind the camera lens, by which means two images are thrown upon the upper and lower halves respectively of the ground glass screen, the eye looking along a path between the two rhombohedra. To use the instrument a sensitive plate is put in place of the upper half of the ground glass. When a sharply defined image has been obtained upon the lower glass, an instantaneous shutter is released in the interior of the camera in front of the upper rhombohedron, and the picture is obtained on the sensitive plate.

The competition in the insurance world to obtain new "lives" is so keen that many contrivances are adopted on the part of agents to ingratiate themselves with possible insurers. The great point is to get an introduction, and, after a little agreeable conversation, to artfully bring up the subject of life insurance and its incalculable benefits by a sort of side wind. One of the most successful agents, who does a large business in the provinces, finds a photographic outfit one of the most useful baits he has ever tried. In calling upon the various farmers, what can be easier than to talk to the farmer's wife or daughters about photography? The matter once started, the next thing is to produce the camera from the gig, and proceed then and there to photograph the members of the farmer's family. "If," as the agent shrewdly remarks, "the farmer has got no family, then I commence talking about his favourite horse, dog, or cow, and the photographs, so far as I am concerned, are quite as good as those of human beings."

Of course the photograph once taken, a second visit is a necessity in order to exhibit the proof, and in this way friendly relations are built up. But one thing the agent informs us is indispensable. The ladies must be flattered; hence an arrangement with a skilful retoucher is indispensable. This makes photography rather a heavy outlay, but the commission paid by insurance offices is now-a-days so large that, though the enterprise is purely speculative, it pays in the long run.

Professor Romyn Hitchcock, in the *American Monthly Microscopical Journal*, gives some valuable hints as to the use of coloured screens in photomicrography. The blue produced by ammonio-sulphate of copper was formerly used, but when colour sensitive plates were introduced yellow screens took the place of blue, because it was found that many specimens had yellow, red, and brown parts which were not well photographed with blue light. The colour and thickness of the screen both require attention. If it be too thin the blue light is not sufficiently cut off. In particular cases an almost monochromatic yellow light is desirable, as when it is desired to obtain sharp outlines of deeply stained objects regardless of structural details.

But generally a rather broader spectrum range is desirable, for the light employed should correspond to the different colours or shades of colour of the object. It is owing to neglect of this consideration that we often see photo-micrographs which are mere silhouettes, while the objects show much more structure to the eye. This is frequently observed in photographs of such structures as the tongue and sting of a bee, and legs of insects. In other preparations, in which the colour is a stain-brown or red, for example, the fault lies partly in the exposure, which, in many cases, is insufficient to give more than outlines and blank interiors. This is frequently noticeable in photographs of bacteria. By a proper choice of a screen, if a screen is required, a photograph should show any object as clearly as we can see it in the microscope. Colour-sensitive plates may be said to be indispensable in the photography of rock sections with polarized light.

It is curious to read in Mr. W. P. Frith's "Reminiscences" how photography, now used so extensively by the police in the detection of criminals, was anticipated by the pencil. Mr. Frith gives two examples. The first relates to an experience of Mulready, who, while walking down the Bayswater Road in 1805, was stopped by a foot-pad armed with a pistol. The artist had no choice but to comply, and, on reaching home, drew the man's face very carefully, taking the drawing to Bow Street. Within a fortnight the man was captured, his apprehension being due entirely to the picture. The second instance relates to Mr. G. B. O'Neil, who was robbed of his watch while looking at the time under a gas lamp near Kensington Church. The time for observation was very short, but the artist was able to make a drawing, which he gave to the police. The man was soon after caught, and at his trial the drawing was produced, and the likeness, together with Mr. O'Neil's recognition, was sufficient to convict him. Mr. Augustus Egg, R.A., also made a drawing in connection with a robbery at his house. Unfortunately the drawing was not that of the thief, but of his dismantled room, with himself standing ruefully gazing at the scene.

From a discussion on a paper read by Mr. W. Lovibond at the Chemical Society on a new method of colour analysis by means of the tintometer, it appears that women, in regard to eyesight, are vastly superior to men. Mr. David Howard, who presided, remarked that in all his experience he had never met with a colour-blind woman, and did not believe that one existed. This opens up a new sphere of woman's work. Where nicety of vision in regard to tints is required, women certainly should be employed.

THE CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION.—I.

The Photographic Exhibition this year at the Crystal Palace contains more pictures than did the Exhibition of 1889, and a smaller show of photographic apparatus. The pronounced novelties in apparatus placed on view are not numerous, but the most interesting feature to the landscape photographer is the evidence of a growing tendency to substitute aluminium for brass, wherever possible, in lens mounts and cameras. The recent improvements in the manufacture of aluminium on a large scale have, according to a statement made some months ago by Sir Henry Roscoe at the Royal Institution, reduced the price of aluminium to twenty shillings a pound.

Messrs. Watson and Son have fitted up an aluminium turn-table to some of their well-known "Acme" cameras, thereby obtaining a palpably great reduction in weight; this reduction, they state, amounts to three-quarters of a pound in a half-plate camera; and in a whole-plate camera, to seventeen ounces.

The same firm has also on view a heavy studio camera and stand, with exceptionally quick screw focussing motions, and fig. 1 will help to explain the principle on which the ponderous camera can be tilted upwards or downwards by the operator. The base of the camera is represented by N K, and W V represent the ends of two wooden bars affixed thereto. A E represents an angular piece of wood, which by a screw motion can be made to slide backwards or forwards horizontally along the top of the stand, whilst the camera base N K is so hinged that it cannot move horizontally. Under these conditions, when A E is moved in the direction indicated by the arrow in the cut, the bar V rises and the bar W falls, and the camera is tilted accordingly; if they be moved in the opposite direction, the end N of the camera will rise, and K will fall. The camera has a large turntable, with spanners of suitable dimensions, and works firmly.

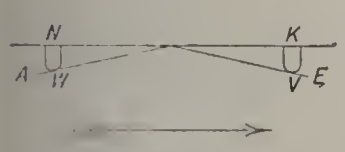

Fig. 1.

The chief feature of the exhibit of Mr. Fox Shew is, of course, his well-known hand-camera, but he has two novelties in the shape of lens shutters. One of these, which he calls "The Eclipse Repeating Shutter," is represented in fig. 2. It has an adjunct which is a blessing, namely, an arrangement by which it can be fitted on to lens hoods of different diameters; this arrangement consists of a compressing ring and an india-rubber washer. The shutter has a pneumatic release, does not require setting, and will work in any position.

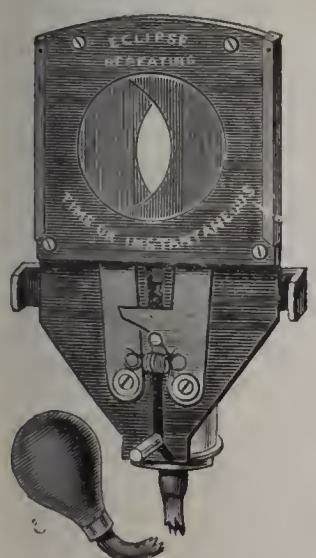

Fig. 2.

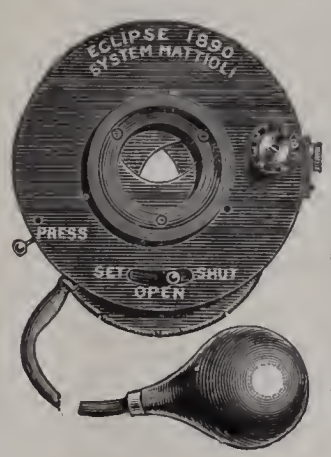

Fig. 3.

The other shutter, fig. 3, exhibited by Mr. Shew, is the invention of an Italian, Signor Mattioli. Mr. Shew calls it "The 1890 Eclipse Shutter." Its mechanism consists chiefly of three sectors, which open concentrically, and are actuated by a revolving flat ring, which travels round and opens or closes them. The shutter has a strong spiral spring with little play; each moving part of the shutter has little work to do, and this principle favours rapidity of action. The following are some of the advantages which Mr. Shew states to belong to the shutter:—(1) It can be fitted in the centre of the lenses, at the back, or on the hood as required; (2) It is of very high rate of speed, due to an entirely new system of propelling disc; (3) It can be adjusted to eight different speeds as well as for time exposures; (4) It is perfectly smooth and free from vibration in its action, whether at full speed or slow; (5) It is smaller and more compact than any shutter in the market, being at the same time very strong, and not liable to be affected by any change of climate—a shutter uncovering a lens for 8 by 5 measuring only 3½ inches diameter by ½ inch in thickness; (6) It is provided with a rotating diaphragm plate corresponding with the stops of the lens; (7) Owing to an improved method of releasing valve, the ball or pear of the pneumatic release is considerably smaller than usual, and instantly refills itself; (8) It is provided with a trigger, which may be used in lieu of the pneumatic release for box detective and other hand cameras; (9) The mode of manipulating the shutter is engraved on the face, thus dispensing with loose instructions.

Messrs. Smith and Beck exhibit their recently introduced aluminium mounts for lenses, and which will effect a considerable reduction in the weight of the apparatus of landscape photographers, more especially of those who adopt the wise system of travelling with plenty of lens power. The aluminium mounts are one-third the weight of brass mounts. There are difficulties in working aluminium. It "drags" under the tool, as does pure copper, so has to be turned slowly under some lubricating medium; for aluminium, paraffin is the medium selected. There is a difficulty in soldering it, which has been partially overcome by Cowles and others. Messrs. Beck and Co. inform us that, "under certain conditions the metal can be soldered; but joints cannot be made sufficiently sound to bear tube drawing. Where tubes are required, they must be drawn out of solid castings, and the results are not even then always as satisfactory as might be wished. Another difficulty in working the metal is that of obtaining a good surface." Aluminium is reasonably free from liability to attack by any chemical substances it is likely to meet when it is in the form of fairly cared-for lens mounts. The lenses, mounted as described by Messrs. Smith and Beck, have iris diaphragms, graduated to indicate the apertures recommended by the Photographic Society. The same firm exhibits its "Pecrops" tourists' camera, one of the features of which is, that it does not rack out, but pulls out, and can then be clamped at once, so that time is saved by the user.

Mr. Stanley exhibits a convenient combined rocker and developing-room lantern, the principle of which may be explained by the aid of fig. 4. In this cut, E E E

represent the red glass front of a developing-room lamp, through the bottom and inclined window of which the rays from the light A fall upon the mirror N M, and are reflected upwards through the glass platform F H F; on this platform the glass developing dish is placed; red light thus passes from below through the negative in course of development, so that the amount of density it is gaining can be continuously watched. Some light from the upper part of the lamp falls at the same time upon the upper surface of the plate in the dish. A rocking motion is given to the platform by means of the pendulum H K. At M the mirror is held by a hinge; a little chain is attached to the other end of the mirror, N, by the aid of which chain the mirror can be raised or lowered, and hooked so as to rest at any required angle.

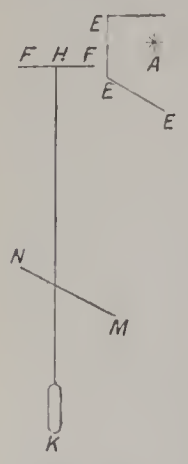

Fig. 4.

Mr. Stanley also exhibits a new magnesium lamp, invented by Mr. Ferrero, intended for the illumination of negatives which have to be copied in the camera, and for other purposes. Fig. 5 will help to explain its principle. In this cut, H N is a sheet of ground glass, closing the major opening of a horizontal pyramidal chamber made of tin, whitened inside. A is a wheel carrying a coil of magnesium ribbon, which is paid out by hand. W W is a small sheet of glass, with a small circular piece of white paper affixed to it at K to prevent the direct rays of the light M falling upon the sheet of glass H N. The rays can thus reach it only by reflection from white surfaces, by which means the illumination is more equalised. When in use, a spirit-flame is constantly burning at the mouth of the tube whence the magnesium ribbon enters the lamp, so that should the magnesium light go out, it is soon re-lit.

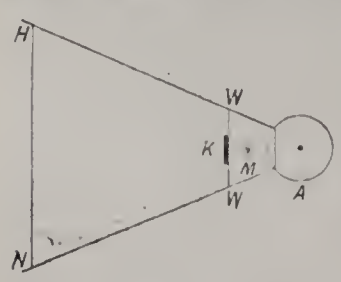

Fig. 5.

The tops of Mr. Stanley's folding-stands are made on the principle indicated by fig. 6, in which D is the wooden top of the fork of one leg, and K E the brass slip attached thereto. B is a part of the stand head, and A B a brass cone on which the fork of the leg bears in use. This conical form is given to the brass peg A B, we are told, to prevent K E from springing to B, and in prolonged use the latter always finds a part of the peg to bear against, instead of touching a flat portion of the stand head proper, in which latter case the stand would be less rigid.

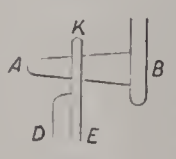

Fig. 6.

Photographic Society of Ireland.—A lantern meeting will be held on March 27th, and on April 11th Prof. J. H. Stewart will take as his topic, "The Stop, and the Optical Centre."

Last Friday night the machine camera invented by Mr. Friese Greene and Mr. Mortimer Evans was exhibited in the library of the Royal Institution after the close of the usual Friday evening lecture. The instrument attracted much attention.

PHOTOGRAPHY IN FRANCE.

French Photographic Society—Exposure Shutter—Developer in Tablets—Halo and Means of Preventing it—Orthochromatism.

Exposure Shutter. — A communication was received from MM. Marillier and Robelet, introducing the instantaneous shutter of R. Blänsdorf. This instrument is truly simple and ingenious. The length of exposure is regulated by a fan which may be changed at will for one of larger or smaller size, as the exposure is desired to be comparatively long or short. The resistance offered by the air to the speed of the fan is greater or less as the surface of the vanes is more or less extended. If the apparatus is well constructed, apparently it should not alone work with almost chronometric exactitude, but should be free from the danger of getting out of order.

Developer in Tablets.—This developer, the composition of which is not stated, is presented in the form of tablets, or pastilles. No weighing is required; it is sufficient to know that for a given quantity of water a certain number of the pastilles will be necessary. Several members of the Society have experimented with these tablets and find them very satisfactory.

Theoretical Explanation of Halo, and the Means of Preventing It.— By a singular coincidence communications have been received at the same time from M. Cornu, of the Institute, and from Messrs. Lumière and Son, of Lyons, relating to the same subject, "The Cause of Halo." From the explanations given, it appears that there are rays which are totally reflected after falling upon the inner surface of the glass. The fact is verified by using a luminous point on a black background. This spot is photographed, and the image shows an aureole or halo round the luminous spot. M. Cornu endeavoured to suppress the halo by covering the back of the glass with a varnish composed of essences of cinnamon or of clove in which a piece of glass is placed, and other essences are gradually added until the glass ceases to be visible. We have then a liquid the refraction index of which is the same as that of the glass. This varnish is blackened with lamp black, and is applied to the back of the plates with a brush. The rays traversing the thickness of the glass are thus entirely absorbed; there are no longer any reflections, and the halo is suppressed. The unfortunate thing connected with this remedy is, that it is not very practicable in application. It is unfortunately difficult to replace this coating by a sheet of paper or by any other black surface, for optical contact is indispensible in order to suppress the halo. To arrive at the desideratum, we ought to be able to manufacture an adhesive black material, the index of which is equal to that of glass, and which might be applied immediately to the back of the glass, thus realising optical contact. In this way the employment of the proposed remedy would be easy.

Contretypes in China Ink.—M. E. Vallot showed a very successful contretype obtained with liquid China ink. It had been produced in the following way. A glass plate covered with bichromated gelatine had been exposed to the action of light under a negative for the desired time, and then developed in water blackened by liquid China ink. The gelatine not indurated by the light imbibed the liquid, and finally an excellent negative was obtained. The same operations may be gone through by immersing the exposed gelatine in a colouring bath of any tint, but it is necessary to use permanent colours if the negative is not

to be liable to fading. This process shows that there is no necessity to use a plate containing silver bromide in gelatine; certainly such a plate may be used if the silver compound is first dissolved in hyposulphite of soda. The plate is then well washed, sensitised in solution of bichromate of potassium, and, after drying, exposed under a negative, and developed in a colouring bath. A perfect contretype is thus obtained.

Practical Orthochromatism.—M. Lèon Vidal—in view of the interest excited amongst the members of the Society by divers presentations relating to orthochromatism—thought it desirable to explain that this art, which consists in reproducing in grey tones (monochrome) the various tonalities of coloured objects, is practically easy of application provided that one is somewhat initiated in the knowledge of the question. In the first place, we should know what are the cases in which orthochromatism is necessary. Generally, he said, it is useless, when working from nature in taking landscapes and buildings, to employ orthochromatic plates. It is sufficient to be furnished with pellicular screens coloured with aurantia of different degrees according to the subject, and a little practice soon teaches what is the depth required for the particular case. In photographing interiors, orthochromatic plates are often necessary, especially for such subjects as fruits, flowers, pictures, and designs in coloured material. In this case, however, the employment of screens is still indispensable, and it is very rarely that their use can be omitted. Now, it is inexact to say that for coloured objects we may use with success one sole orthochromatic preparation. Preparation of eosine, erythrosine, and chrysaniline, may do for reproductions where yellow, green, and orange are the dominant colours; but where red is dominant, it is absolutely necessary to have recourse to other preparations, notably chlorophylla cyanine, or to a mixture of erythrosine and cyanine. The best thing to do, then, when not engaged in some definite work for which ordinary commercial plates may be suitable, is to make orthochromatic plates oneself, by preparing them for the particular kind of work to be done. Nothing is easier or simpler than the preparation by the bath method, and he asked himself in vain how it happens that so few persons have, up to the present, thought of preparing their photographic palette. For our own part, says the author of the communication, we continue to make various preparations for the purposes of our work, and we succeed with the most complete facility. The conclusion arrived at is, that except for special cases, it is better worth while to prepare oneself the plates that may be required, than to use commercial ones, and that it should be remembered that more often than not the screen alone suffices, and that its use is indispensable for correcting tonality, even when using orthochromatic plates. By the aid of lantern slides M. Vidal showed results obtained with and without screens on orthochromatic plates, as well as on ordinary ones, and called attention to the very feeble difference existing between views of the same subject taken by him on ordinary and on orthochromatic plates when used without a screen.

The meeting terminated with the exhibition of some very fine lantern slides by M. Bagnet and M. Balagny.

Leon Vidal.

The Earl of Crawford and Balcarres has closed and dismantled the observatory at Dun Echt, which has been so well-known to all astronomers for many years past, and has presented all the instruments and the astronomical library to the Royal Observatory at Edinburgh.

Patent Intelligence.

Applications for Letters Patent.

3,329. J. Clegg, Connaught Mansions, Victoria Street, Westminster, "Light Emitters for Lamps."—March 3rd.

3,338. W. H. Prestwich and E. P. Prestwich, High Road, Tottenham, "Bicycles and Tricycles."—March 3rd.

3,392. W. Griffiths, King's Heath, "Detective Camera."—March 4th.

3,393. E. W. Foxlee, 22, Goldsmith Road, Acton, London, "Flexible Film."—Marth 4th.

3,403. C. Hudson and J. S. Hudson, 3, Langdale Terrace, Stockton-on-Tees, "Applying Mucilaginous Substances to Paper."—March 4th.

3,446. A. P. Riley, 77, Chancery Lane, London, "Camera and Receptacle."—March 4th.

3,482. L. Van Neck, 45, Southampton Buildings, London, "Cameras."—March 4th.

3,494. E. W. Parish, 19, Bowling Green Street, Leicester, "Cleaning Prints."—March 5th.

3,546. M. E. Banger, 98, Salisbury Road, High Barnet, Herts, "Automatic Continuous Flashlight."—March 6th.

3,571. R. Slingsby, 115, Cannon Street, London, "Discharging Flash Lamps and Photographic Shutters."—March 6th.

3,597. A. Penhiro, 22, Southampton Buildings, London, "Cameras."—March 6th.

3,718. R. W. Thomas, 181, Cheapside, London, "Portable Artificial Light Studio."—March 8th.

3,730. M. Evans, 321, High Holborn, London, "Cameras."—March 8th.

Specifications Published.

5,374.—*March 29th*, 1889. "Photographic Printing." William Walker James Nicol, Mason College, Birmingham, Doctor of Science, Lecturer on Chemistry.

My invention has for its object the production of photographic pictures or images in silver on paper, wood, or other surfaces.

For this purpose I apply to paper or other suitable material, a coating of a ferric salt, alone or mixed with the other salts hereinafter specially mentioned; the surface thus prepared is sensitive to light. The ferric salt used may be that of any of the organic acids afterwards mentioned, which prevent the precipitation of iron by ammonia; or it may be any other ferric salt sensitive to light, and the precipitation of the iron is in this case prevented by the addition of a sodium, ammonium, or potassium salt of one of the organic acids, which prevents the precipitation of iron by ammonia, and this may be employed either in the solution with which the paper or other material is coated, or it may be added to one or other of the solutions subsequently used. The surface sensitive to light is then exposed to the action of light under a negative or other screen of similar character, when after some time a faint image becomes visible. It is then brought in contact with a solution containing silver nitrate or the other salts of silver (subsequently mentioned) dissolved in ammonia, to which has been added potassium oxalate, or the other salts mentioned later, which may tend to increase the rapidity and vigour of the development, alter the tone of the finished picture, or prevent the precipitation of the iron by the ammonia. The print is then washed in water to which has been added ammonia, and a salt of one of the organic acids, which prevents the precipitation of iron by ammonia. A subsequent washing in water, followed by drying, completes the operation.

Hitherto no means have been known by which, when using ferric salts as sensitisers (*i.e.*, for coating the paper), and developing with solutions containing silver salts, a print could be obtained, the tone of which was such that toning with gold or other metals, followed by the use of sodium-thio-sulphate, could be dispensed with; I therefore greatly simplify the operations involved, and add to the permanency of the finished print. According to my invention, I use paper, wood, glass, woven or other material, the surface of which I prepare and

render sensitive, by applying to it in any convenient manner a solution prepared in one of the following ways :—

1. I make a solution of normal ferric sodium citrate ($Fe\ Na_3\ (C_6\ H_5\ O_7)\ 2$) containing twenty per cent. of the salt as expressed by the above formula, and add to it five per cent. of normal potassium oxalate ($K_2\ C_2\ O_4$), but I do not confine myself to these exact proportions; they may be altered according to the vigour and tone desired in the resulting picture. In place of the ferric sodium citrate mentioned above I sometimes use other salts as follows :—Ferric ammonium citrate or ferric potassium citrate or the corresponding salts of tartaric acid, also ferric tartrate and ferric citrate, and I sometimes use a mixture of these ferric salts with citric or tartaric or oxalic acid, or the salts of these acids with potassium, sodium, or ammonium. I have also been very successful with solutions of ferric salts which are precipitated by ammonia either alone or with one or other of the above salts and acids. Thus I have obtained excellent results with the following :—

2. I make a solution containing five per cent. of normal ferric oxalate ($Fe_2\ (C_2\ O_4)\ 3$), and five per cent. normal ferric tartrate ($Fe_2\ (C_4\ H_4,\ O_6)\ 3$), and one per cent. of tartaric or oxalic acid ; in this case the precipitation of the iron is prevented by modifying the developer or subsequent solutions as stated below. I do not, however, confine myself to these exact proportions, as they may be altered according to the effect desired, as stated above. In general, however, I prefer to use one or other of these solutions, the composition of which I have stated in full. In some cases depending on the nature of the surface to be coated: if, for instance, it be glass, wood, or cloth, thickening material, such as gelatine, starch, arrowroot, or gum-arabic may be added to the above solutions; usually this is not required for paper. The paper or other surface prepared with one or other of the foregoing solutions is dried, and is then ready for use. After exposure to light in the usual manner I apply to it the developing solution.

I use solutions of various soluble salts of the metals of the alkalies or ammonium. I have been most successful with the following—viz., potassium, sodium, or ammonium, oxalate, acetate, borate, citrate, or tartrate, either alone or mixed together.

1. Thus, with paper sensitised with No. 1 solution, for cold blue-black tones I prefer a solution containing—(*a*) 20 per cent. potassium oxalate ; 1·5 per cent. silver nitrate, the precipitate formed being nearly dissolved by the addition of ammonia. (*b*) For black neutral tones :—10 per cent. potassium oxalate ; 1·5 per cent. silver nitrate. (*c*) For sepia tones :—7 per cent. borax ; 1·5 per cent. silver nitrate. In both cases ammonia is added as above.

2. When the paper is sensitised with No. 2 solution I prefer a solution containing—(*a*) 15 per cent. potassium citrate ; 10 per cent. sodium acetate ; 1·5 per cent. silver nitrate ; or (*b*) 15 per cent. potassium citrate ; 10 per cent. potassium oxalate ; 1·5 per cent. silver nitrate; ammonia being added in both cases as above.

The developing solutions 1, *a*, *b*, or *c*, may be used with paper prepared with sensitising solution 2, if the prints, after removal from the developing solution, are placed for a short time in a solution prepared thus :—

Clearing solution—20 per cent. solution of citrate or tartrate of potassium, sodium or ammonium rendered distinctly alkaline with ammonia. When greater contrast is desired in the print I obtain this by adding an oxidising agent to the developer, preferably a salt of chromic acid in quantities of from 2 to 10 c.cms. of a 5 per cent. solution of potassium chromate to the litre of developer. I do not confine myself to any definite temperature of the developer, though I prefer to use this at the temperature of the air. The developer may be applied to the printed surface in any convenient way.

After treatment with the developer the print is washed in successive changes (*i.e.*, till iron and silver salts are removed) of the washing solution. I prepare this as follows :—Washing solution—A 25 per cent. solution of sodium citrate is mixed with an equal volume of strong ammonia solution. This is then diluted with ordinary water in the proportion of 150 c.cms. to every 10 litres of water. Potassium or ammonium, citrate, or potassium, sodium or ammonium, tartrate, or sodium, potassium tartrate, may be used in place of the sodium citrate in the above.

The prints are then washed in water and dried.

Having now particularly described and ascertained the nature of my said invention, I wish it understood that I do not confine myself to the mixtures mentioned, or to the exact proportions of the ingredients given therein, but employ on occasion other mixtures and proportions of the salts particularly mentioned as suitable for my purpose, nor do I confine myself to aqueous solutions of the said salts, but may for the purposes of preparing the sensitising and developing solutions use other solvents where these are permitted by the chemical nature of the salts employed, and I therefore claim as my invention as follows :—

1. The use of paper or other surfaces coated with ferric salts as described above, to be used for the production of photographic images in silver, along with the class of developing solutions already given and particularly referred to in my second claim.

2. The use of solutions of silver salts dissolved in ammonia in conjunction with salts of the alkalies or ammonium with oxalic, acetic, boric, citric, or tartaric acids, for the purpose of producing on paper or other surfaces previously coated with ferric salts sensitive to light, images in silver which are of such a colour as not to require toning with gold or other metals.

3. The combined use of ammonia and a potassium, sodium, or ammonium salt of citric or tartaric acid, in a solution used for washing prints obtained on surfaces coated with ferric salts, and developed with solutions of silver salts in ammonia.

4. The use of the solutions—sensitising solutions 1 and 2. Developing solutions 1 *a*, *b*, and *c* ; 2 *a*, *b*, and *c*. Clearing solution ; washing solution in the way and manner substantially as described and set forth in the foregoing.

5. The use of an oxydising agent, such as chromic acids or any of its salts, in a developer prepared as described and set forth.

4,716. *March 18th*, 1889. "Photographic Cameras." James Yate Johnson, 47, Lincolns Inn Fields, London, Gentleman, communicated from abroad by Henri Pusset, of 48, Rue de Bondy, Paris.

An improved photographic camera, according to this invention, is provided with a magazine containing a number of sensitive plates which are capable of being pushed towards the front by a spring. These sensitive plates are separated from each other by plates of ebonite or other material not liable to be affected by the chemicals employed in the developing process, which may be performed in the interior of the camera, as hereinafter explained. The plates are pressed together by the action of the spring, and a partition working in suitable guides so as to push forward the plates without inclining or tilting them may be interposed between the plates and the spring at the back.

To charge the magazine with plates a slide at the back is drawn out so as to disengage a sliding cover which, being drawn back, horizontally exposes the interior of the magazine so that the plates can be inserted, after which the magazine is closed by returning the slides to their original position. When a plate has been exposed, it is pushed by means of a flexible slide or curtain into a light-tight bag underneath the magazine. The plate can then be passed through an opening in the lower part of the back into a dish on the bottom of the camera, in which it can be developed, the process being watched through an opening covered with ruby glass in the top of the camera. The interior of the camera is lighted during this operation by means of one or more ruby glass windows or openings in the side or sides. These openings may be provided with dark slides or shutters.

The developer is introduced into the dish through a rubber tube fitted to a short tube attached to the bottom of the dish. This short tube protrudes through an opening in the bottom of the camera so arranged as to admit of the necessary movements of the dish.

The camera is provided with a sliding shutter, which is

retained in the closed position by a spring catch. A rubber spring tends to pull down the shutter and uncover the lens. By means of a rod the spring catch can be caused to release the shutter, which thereupon descends and uncovers the lens. A pin on the shutter then comes in contact with a horizontal rubber spring or band, the elasticity of which causes the shutter to rebound and return to the closed position, where it is retained by the spring catch. The shock is absorbed by a spring provided for the purpose.

To exclude light from the magazine the flexible slide or curtain hereinbefore referred to is arranged to close the opening between the magazine and the camera, and extends downwards through an opening in the bottom of the magazine sufficiently to cover the opening hereinbefore referred to in the lower part of the back of the camera. The opening in the bottom of the magazine for the passage of the shutter is closed by a spring shutter when the slide or curtain is drawn up. This flexible slide works in a vertical groove in the front of the magazine, and in a horizontal groove in the top of the latter.

The camera may be provided with two focus finders, in which the image is projected by a lens on to a mirror which reflects it on to ground glass screen in the usual way. One of these focus finders is used for pictures taken with the longer axis of the plate vertical, the other serving for pictures taken with this axis horizontal. The apparatus is further provided with a focus finder of special construction, composed of a convex mirror receiving light through an opening in the front of the camera, and which can be seen through an opening in the top of the camera. A small hole is formed in the centre of this mirror, and a thread or wire extending diagonally across the opening in the front carries a register mark, such as a small glass bead. In order to direct the camera on an object it is held under the arm in such a position that the register or bead coincides with the hole in the centre of the mirror. This mirror may be made of glass tinned or simply blackened at the back.

On Thursday, March 20th, there will be an exhibition of lantern slides at the Society of Arts in connection with the Camera Club Conference.

Photographic Club.—On Wednesday, March 19th, the adjourned discussion will be held on "Artificial Light as an Adjunct to Daylight"; March 26th will be the monthly lantern meeting.

Travellers in Russia are now obliged to have their photographs annexed to their passports. The photographer, however, rarely has any good fall to his lot without having to pay some compensation for it. The Russian law will soon impose a stamp duty upon eartes-de-visite.

Sheffield Photographic Society.—An exhibition of photographic slides has been given at the Montgomery Hall, in aid of the building fund of the Public Hospital and Dispensary. The slides were mostly the work of members of the Society, the majority being of local interest, and were exhibited by means of a powerful lantern belonging to Mr. W. D. Forsdike. The slides were described and commented upon by Mr. Alleyne Reynolds. The first series of photographs consisted of views in Sheffield, and most of them instantaneous street scenes. Following these were a number of pictures taken in the suburbs, and afterwards photographs of Derbyshire views were exhibited. The exhibitions concluded with a number of miscellaneous views.

A London Summer Photographic Exhibition.—Mr. Kenric B. Murray, Secretary to the London Chamber of Commerce, sends us information about a proposed city summer photographic exhibition, under the auspices of the Photographic Trade Section of the London Chamber of Commerce. He says that it has been decided by the Photographic Trade Section to organise an exhibition of photographic apparatus and pictures, to take place in the centre of the City of London from the 1st to the 15th June next, and that it is believed that one of the largest of the City Companies will kindly give the Section the free use of its hall and rooms for this purpose. The undertaking has a long list of "patrons," headed by the Lord Mayor.

Correspondence.

THE ROYAL METEOROLOGICAL SOCIETY.

Sir,— At the ordinary meeting of the Society to be held by kind permission of the Council of the Institution of Civil Engineers at 25, Great George Street, Westminster, on Wednesday, the 19th inst., at 7 p.m., the following papers will be read:—

"A Brief Notice respecting Photography in Relation to Meteorological Work," by G. M. Whipple, B.Sc., F.R.Met.Soc.; "Application of Photography to Meteorological Phenomena," by William Marriott, F.R.Met.Soc. These papers will be illustrated with lantern slides.

After the reading of these papers the meeting will be adjourned, in order to afford the Fellows and their friends an opportunity of inspecting the exhibition of instruments illustrating the application of photography to meteorology, and of such new instruments as have been invented and first constructed since the last Exhibition.

The Exhibition will, at the request of the Secretary of the Institution of Civil Engineers, be open in readiness for their meeting on Tuesday evening, the 18th inst., and will remain open till Friday, the 21st inst.

William Marriott, Assistant Secretary.

30, *Great George Street, Westminster, S.W., March*, 1890.

THE LANTERN SOCIETY.

Sir,—The adjourned general meeting of the above Society will be held in the Regent Street Saloon of the St. James's Hall on Wednesday, March 19th, at 7.30 p.m., for the purpose of considering the rules drawn up by the provisional committee.

T. H. Holding, Secretary *pro. tem.*

46, *Chesilton Road, Munster Park.*

Proceedings of Societies.

Photographic Society of Great Britain.

At the meeting of this Society held on Tuesday evening, the 11th inst., the chair was occupied by Mr. J. Glaisher, F.R.S., President.

Mr. G. L. Addenbrooke, who had been announced to open the discussion on Dr. Lindsay Johnson's paper, adjourned from the previous meeting, sent a letter regretting his inability to be present, and giving his views on the subject. He thought that the scheme for an Institute proposed by Dr. Johnson could only be accomplished either by obtaining a charter for the Society, and granting diplomas for which fees could be charged, or by munificence of private donors.

A letter from Dr. Emerson was also read, in which he said that he thought the proposed Institute ought to be independent of any other body, such as the authorities of South Kensington. He had no idea of sharing rooms with any other Society, but would like the Institute to have its own premises, in which there ought to be a library, a laboratory, space for exhibitions, a dark room, &c., as well as a museum. There should be courses of lectures, and those who attended them should be furnished with diplomas of the Society, but for the first year or so members of the photographic societies should receive diplomas without qualification. As to the Society's Journal, he thought that in it the art side of photography had been sadly neglected, and that there should be associated with the Editor some one specially qualified and interested in that department. The management of the proposed Institute should be entrusted to amateurs and professionals who were practical men, and those who merely took up photography in a *dilletante* spirit should be excluded from office.

Mr. W. S. Bird said that they had to consider whether a scheme could be drafted that would be capable of being put into effect. He thought that in the first instance a subscription list should be opened. If members came forward so that they could start with £2,000, they could appeal with much better grace either to the City Companies or to the public. Dr. Johnson, he knew, felt strongly that with a proper programme help might be obtained from the City Companies,

Mr. T. Scamell thought that before going to the public for money they ought to have some notion of the probable cost of the building. It seemed to him that £10 a head from every member of the Society would go but very little way towards the expense necessary. If, however, he were furnished with details as to the size and number of rooms required, he would calculate something like what the cost might be expected to be.

Mr. W. E. Debenham thought that it was not desirable to offer a bait to persons to join the Institute by proposing to confer diplomas without examination or qualification. Diplomas were supposed to represent some ascertained competency, and he thought it not dignified to use them in the way proposed.

Mr. W. Bedford said that an ideal had been placed before them, and if that ideal was pitched rather high, it was perhaps as well that it should be so. The first question was whether a charter could be and should be obtained. Before any appeal was made either to the public or to the City Companies, the Society ought to be in a position to show that the Institute proposed to be formed would really advance photography. Photography, he thought, might very well lay claim to a share in the public munificence, although for his own part he would rather work on the basis of improving the present position of the Society.

Mr. Chapman Jones understood that some of the speeches implied that the Institute was to have power to license photographers.

Mr. Bird said that it must not be supposed that any compulsory powers would be vested in the Institute, but he was quite certain that traders and photographers would consider the diplomas valuable, and would obtain them. In any case, it would take several years to carry out such a programme as had been sketched out.

Mr. T. Sebastian Davis said that although it was desirable to have the Exhibition premises and the meeting and other rooms in the same building, it might not be absolutely so, and it might be found more practicable to get the premises they required separately.

The Chairman said that it might be an instruction to the council to ascertain the cost and the probability of obtaining a charter, and this course was approved.

Mr. John Spiller, F.I.C., F.C.S., read a paper on "Early Experiments by Dr. Percy and Mr. George Shaw on the Chemical Phenomena of Light." Having been a pupil, assistant, and friend of Dr. Percy, he had been trusted by his executors with his photographic note-book. Mr. Shaw, too, had given free permission to use the notes. Mr. Spiller wrote on the blackboard the following table, showing the direction of the experiments made, some of which dated back as far as 1844 :—

First Set of Experiments.

a	AgCl in air
b	,, ,, hydrogen
c	Moist AgCl in air
d	,, ,, ,, nitrogen-K in tube
e	,, ,, ,, ether vapour

Second Series.

1	Dry AgCl in dry chlorine
2	,, ,, ,, ,, nitrogen—K and CaCl in tube
3	,, ,, ,, iodine vapour
4	,, ,, ,, air with phosphorus
5	Silver foil in dry chlorine

Third Series.

I.—Dry AgCl in dry Cl
II.—AgCl in moist Cl
III.—Dry AgCl in dry air

The expressions K in tube, K and CaCl in tube, meant that there was potassium to absorb oxygen, and chloride of calcium to absorb moisture sealed up in the same tube as the silver chloride. These substances were not, however, in contact with the sensitive substance, but were enclosed in a sort of chamber in the tube, and packed in with asbestos. The result of these experiments was, that after exposure to light, the AgCl in the tube marked *a* of the first series had undergone the least change of the set, whilst if there was any difference in the others, that in the hydrogen had been the most affected. In the second series, it was noted that the silver chloride, which was reduced by the action of light, became reconverted into the original compound when put away in the dark. The chloride in tubes 2 and 3 became chocolate brown, and the iodine present in No. 3 did not retard this change. In No. 4 tube, the chloride darkened considerably, and to some extent even in the dark. In No. 5, the silver foil acquired a beautiful iridescence by exposure to light. In the third series, the last tube No. III. rapidly changed colour, and of the others, No. 2 (that containing moist chlorine), was more quickly darkened in the light, and more rapidly bleached in the dark than No. I.

The Chairman called attention to the fact that the April meeting would be held on the 15th, and not on the customary second Tuesday in the month.

Mr. F. F. Baggalley was elected a member of the Society.

Camera Club.

On Thursday, March 6th, Mr. Andrew Pringle gave an address on "The Optical Lantern." Mr. Francis Cobb occupied the chair.

Before the lecture a handsome testimonial, consisting of a silver jug and three goblets, was presented by the members to Mr. E. G. Spiers, as a friendly recognition of his valuable services as late Hon. Secretary to the Camera Club Company.

The Secretary handed round a copy of the work called *Giphantia*, bearing the date 1761, in which was found the singular forecast of photography read at a previous meeting. The book, which had been lent by Mr. A. C. Lyster, is a translation from the French work *Giphantie*, by Tiphaigne de la Roche, published at Cherbourg. The Secretary also handed round a convenient little actinometer, arranged as a small printing frame, in which a little scale of letters of different densities, printed on silver paper, served as the indication of sufficient exposure for printing in platinum. He believed that the instrument would be brought out by the Platinotype Company.

Mr. Charles White also exhibited a series of photographs bearing on the subject treated of at the previous meeting, "Photography applied to Medicine and Surgery." The photographs showed in succession the means adopted for patching up and giving artificially a normal appearance to the face, in the case of a patient who had suffered severe ravages from cancer.

Mr. Andrew Pringle said that for some years he had made a variety of experiments in relation to the optical lantern, and had gained a certain amount of experience, especially in regard to the lime light. He would not deal with the historical part of the subject that evening, but would remark, in passing, that he had been told that the optical lantern was first invented of John the Baptist—that is to say, by Giambatista Porta. The condenser, provided it be large enough for the slide, cannot be too small ; a 3½-inch condenser will cover an ordinary lantern slide with a circular mask, but not if the slide have an oblong mask. The diameter of the condenser should be slightly greater than the diagonal of the mask. The smaller a condenser can be made, the shorter will be its focal limit, and about 2½ or 2¾ inches is about the nearest a lime light can be brought to it with a reasonable amount of safety. Nine out of ten of the condensers now in the market consist of two plano-convex lenses, mounted with their curved sides towards each other. Herschel's condenser consisted of a slightly meniscus and a double convex lens ; the double convex lens was mounted in front, and the meniscus behind, with its concave surface towards the light. He did not know that one of these condensers was better than the other. Then there was the triple condenser, due to the optical ingenuity of Mr. John Traill Taylor, and which picked up a considerable percentage of the rays from the source of light, which percentage would otherwise have been lost in space. This plan, however, lengthened the focus of the system. Mr. Dallmeyer had made a condenser which he (Mr. Pringle) had not tested against any other, and the Camera Club possessed one of them. Any person using the lantern would not be far wrong in using the first and commonest of the condensers he had mentioned, for it was the best all-

round condenser, and the one he almost always used. The projection lenses should give a flat field, and be of sufficient diameter to transmit plenty of light ; lenses for ordinary lantern views work at not less than *f*/4. As everywhere in optics it is a case of compromise : as the aperture is enlarged, definition is sacrificed ; and as the lens is stopped down, light is sacrificed, and better definition obtained. When oil is used in the lantern a good draught of air is necessary, and the air channels must be of larger size than necessary when the lime light is employed. He knew no reason why lanterns should be made of such enormous size as at present, whereby they had become so bulky to carry anywhere, as to make life not worth living. Here the speaker exhibited a small lantern made by Messrs. Newton and Son ; also another and smaller one made by Mr. Beard. As to the cottages sold by some makers to produce dissolving effects, he felt great respect for those who could afford to buy them ; as for himself, he did not feel inclined to use these enormous edifices ; they might be useful to professional lecturers, for to give dissolving views the register must be everywhere perfect, and great care taken beforehand in preparation. Mr. J. Malden had the most perfect lime light arrangement for such lanterns that he had ever seen, but a vast amount of preparation was necessary, and his (Mr. Pringle's) remarks that evening were not intended for professional lecturers at all, but for those who used lanterns for home purposes. The speaker then said a little about the history of jets, beginning with that invented by Canon Beechy, in which oxygen was driven up through the centre of an argand oil flame, and acted upon a ball of lime suspended within the flame. He next described the blow-through and mixed gas jets, and he spoke of a mixed jet in which he used common gas from the main at the ordinary pressure thereof ; in this he used a specially small nipple, and obtained quite as much light as from a blow-through jet, and the light was concentrated on a smaller area. He next exhibited a mechanical device, consisting of a cut-off for economising gas ; he said that one of the same kind, but slightly differing in form, is made by Mr. Steward. The gas in jets, he continued, must not travel round any sharp corners, or the flame will roar, and the "way" inside the pipe must be smooth everywhere. He believed that there were, practically speaking, only two kinds of lime cylinders in the market, namely, Nottingham limes and the composition limes ; the first is the best except for blow-through jets, which require a softer lime. The composition limes are usually very truly turned ; but the Nottingham limes are badly turned as a rule, so lose much of the advantage they would naturally possess, otherwise they would be the best for mixing jets. He had tried various substitutes for limes, but, in his hands, they had all been utter failures. The oxygen obtained direct from chlorate of potash was usually the best ; but within the last month or two Brin's had been improving a great deal. He had found Beard's regulators to be excellent, and said that they are now in use nearly everywhere ; he had never used the early ones, but spoke of those with recent improvements. As for lantern-slide carriers, he would rather have none of them ; he did not know any better than Chadwick's for the single lantern ; he thought Beard's to be the best for the dissolving lantern. Mr. Cembrano had brought a carrier that evening to the meeting, and which had been invented by Mr. Cowan ; he had never seen it before, and no doubt it would be examined by the members present. The nature of the screen used is very important ; with a bad screen at least twenty-five per cent. of the light may be lost to the observers ; if any light can be seen behind the screen, that is so much light lost to the spectators. A properly plastered wall is the best screen. For a flexible screen he recommended one coated with a size charged with zinc white ; it must not be a shining screen, neither must it be too thin, for then much of the light will be lost by absorption. For darkening a room in daylight, Clarke's patent shutters are the best. An open stage to the lantern is almost a necessity. Mr. Newton has made a lantern which can be turned up in a moment, if necessary, so as to point to the ceiling, and the image can then be thrown on the wall by means of a mirror or prism ; this device is useful to show objects which must be kept in a horizontal position.

Mr. Beard then exhibited Hardwich's ether tank at work.

Mr. J. Traill Taylor said that the triple condenser caused an enormous increase in the illumination of the projected image, and that all the best American lanterns had triple or quadruple condensers. He was having apparatus constructed to make oxygen on the spot, and to supply it automatically to the lantern at proper pressure and in proper quantity directly it was evolved. He was aware that apparatus to do so had been invented in Manchester, but it was large and cumbrous. He then described means he had devised to get a parallel beam for polarisation by a reflecting bundle of glass plates ; he placed a concave lens in the conical beam from the condensers.

After some remarks from other speakers, and a reply from Mr. Pringle, a vote of thanks was passed to the latter.

The Chairman said that the tilting of the lantern was nothing new ; he had seen it done some years ago at the Society of Arts.

London and Provincial Photographic Association.

At the meeting on the 6th inst., Mr. R. P. Drage occupied the chair.

Mr. F. York sent to the meeting some lantern slides of French make, showing an opaque deposit on the inside of the cover glasses, which were detached for inspection. A letter from Mr. York accompanying the slides stated that he had received them from an old lanternist in Trinidad, who attributed erosion to the extreme humidity of the climate during the summer months. Government lenses were similarly affected, and had to be repolished. Mr. York also stated in his letter that during his stay in the West Indies he saw some plates packed face to face separated by pieces of cardboard at each end ; between the plates a network of fungoid growth had sprung up, due to the same cause.

Mr. T. E. Freshwater stated that he had seen a great many lenses that had been sent from Barbadoes to this country to be repolished. In every case they were of foreign manufacture. He knew of no instance of English glasses being affected in the same way.

On the subject of a remedy for condensation on lantern slides, Mr. A. Haddon suggested the removal of the free alkali from the surface of glass by boiling. Glass so treated would not be so liable to condense moisture with change of temperature.

The Chairman asked for the best method of removing carbon images from opal plates.

The general opinion was in favour of rubbing with very fine silver sand or emery powder.

Mr. A. Haddon would soak the plate in hot water, then pour over it strong hydrochloric acid, giving the plate a good wash afterwards.

Mr. F. P. Cembrano showed a lantern carrier made in brass, from a model designed by Mr. A. Cowan, and exhibited by him at one of the meetings of the Association.

The competition pictures were exhibited. The conditions, as previously announced, were that the prints should all be from three negatives selected by the members, and that any printing process might be employed. All the members present, except the exhibitors, acted as judges, each member having three votes, with the result that two awards fell to Mr. F. P. Cembrano, and one to Mr. J. B. B. Wellington.

Sheffield Photographic Society.

At the last monthly meeting, held at the Mason Hall, on Tuesday evening, Mr. B. J. Taylor occupied the chair.

The judges' awards in lantern competition for the best series of six slides was announced as follows :—"In the opinion of the judges no set of slides was of sufficient merit to take the first prize ; the same was, therefore, withheld." The second was awarded to Mr. W. T. Furniss, who also secured the prize for the best slide in the competition. The whole of the slides were afterwards passed through the lantern.

Mr. G. Bromley gave a demonstration and lecture on the new benzoline saturator, as an adjunct to the optical lantern. He commenced by showing the working of the oxy-hydrogen mixed jet light. Having explained the details

and points requiring care and attention, he passed on to the ether light, explaining the method of charging the saturator and connecting the tubes. The lecturer showed that no fear of explosion need be entertained ; that a "suck-back" could not happen, providing pressure was maintained on the oxygen gas, and the chance of firing the saturator minimised again by carefully draining away the fluid not soaked up by the stuffing in the saturator tubes. The best light was obtained when just short of hissing at the jet, and it could be maintained at equal brilliancy by slight attention from time to time to the cylinder key and turning the lime. Attention was next drawn to the benzole and benzine saturator—firstly, the method of charging was shown, next the warming appliance for increasing the volatilisation of the fluid, and lastly the connection with the gas and lantern jet. It was explained that a jet with larger aperture could be used with this light than was practicable with ether, but on application little, if any, difference was seen in the brilliancy. Gasoline could, with advantage, be used in place of benzine, and altogether the process, as compared with ether, was more economical ; if anything, the light was more intense and penetrating, and certainly, in the hands of the operator, produced the best results, the ordinary mixed jet being inferior to ether, although it had many good points in its favour. The same slides were used in each case, so that the comparison should be equal and fair.

Lewes Photographic Society.

A meeting was held on the 4th inst., the President in the chair. Two new members were elected.

A vote of condolence with the widow and family of the late Mr. Simon Norman was passed.

The slides sent in for the first quarterly competition were passed through the lantern, and the awards of the judges were as follows :—Class 1 (landscape)—Mr. A. H. Webling ; Class 2 (architecture)—Mr. Percy Morris ; Class 3 (any other subject)—Mr. G. E. Constable. There were fourteen sets sent in from seven competitors.

A special general meeting is to be held to-day, to consider the question of carrying out a photographic survey of the district, when a paper on the subject will be read by the Hon. Secretary.

East Dulwich and Peckham Photographic Society.

A meeting was held on March 7th, Mr. F. W. Edwards in the chair, when hand and detective cameras were the topic for consideration.

Amongst the specimens on view were Fallowfield's "Facile" and Abraham's "Ideal." Another exhibit was a shutter, for which the advantage was claimed that it could be regulated for speed, as the setting was automatic. A camera which was introduced resembled, in appearance, a walking stick. It was made entirely of metal, was light, and yet, when set up, very rigid. Furnished with a ball and socket joint at the top, it is easily opened and closed.

The Society having decided to exhibit at the Crystal Palace Exhibition, the members brought a good number of photographs to the meeting.

Dundee and East of Scotland Photographic Association.

March 6th.—General meeting, Mr. D. Ireland in the chair.

Eleven competitors entered for a lantern-slide competition. The votes having been scrutinised, the following were declared the prize-winners :—First, Mr. D. Ireland ; equal seconds, Messrs. J. R. Stewart and A. Wilson ; third, Mr. V. C. Baird.

Mr. A. Stewart gave an account of his visit to Western Norway in the s.s. *St. Sunniva*. After a few introductory remarks he showed a number of lantern slides, with descriptions.

G. D. M.—Your reply to Mr. Pringle includes answers to criticisms, by different persons, of your utterances made in another journal, which criticisms many of our readers have not seen.

Answers to Correspondents.

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

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

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

Senoj. (Malvern).—*Exhibition Announcements.* If you are a member or exhibitor of any one of the leading photographic societies, especially those publishing a list of members like the Parent Society, you will be sure to receive a notification of all forthcoming exhibitions. Without being so, you must take the trouble of watching the advertisements and special announcements. The Pall Mall Exhibition always receives at Michaelmas, and opens a week later.

J. D.—*Fuel for the Ligroine Lamp.* Ordinary benzoline is the liquid now recommended for charging the boiler ; it is not necessary, therefore, to look about for a product of exceptionally low boiling point, such as gasoline, although this was specified in the first published account. We are glad to hear of the apparatus coming safely to hand, and regret that your second letter could not be answered last week.

J. C. J. (Nice.)—*Developers for Prints on Gelatino-Chloride Paper.* The hydroxylamine developer (see page 197 of the Year-Book) answers very well for the alpha paper of the Britannia Company, Ilford. You have the choice of two qualities, rough or smooth.

R. L.—*Flash Powder Explosions.* The dangers to which we directed attention some months ago have received an awful exemplification in the article on page 191 of last week's News. By the incautious admixture of magnesium powder with picric acid, chlorate of potash, sulphide of antimony, &c., five lives in all have been sacrificed in America, enough to preach a warning to those who ignorantly deal with such detonating substances. With magnesium alone projected through a spirit flame, all such terrible disasters may be avoided, but it is well, even then, to keep a vigilant look-out for dropping fire.

L. T.—*Price of Platinum.* Owing to the demand for electrical purposes, superadded to the use of this metal in photography, the price of platinum has recently advanced. At the sale of Dr. Percy's effects last week twenty-eight ounces realized £55 3s., and this included some scrap; so that £2 per ounce is about the lowest quotation at the present time.

A. M. (Bootle).—*Test for Alums.* It is, perhaps, immaterial whether you employ potash or ammonia alum ; but they may be distinguished by warming up the solution with caustic soda, when the latter will give off the odour of ammonia. A negative result is here sufficient to indicate potash alum. The sulphate of alumina is more strongly acid.

D. H. M.—*Blisters on Bromide Paper.* The fault is most likely inherent to this particular lot of paper, which was coated too dry, and so the attachment of the gelatino-bromide coating is imperfect. From your description there is nothing wrong either in the chemicals or manipulation. Albumenized paper sometimes fails from the same cause.

C. J.—*Collotype Films.* Gelatine sensitized with a five per cent. bichromate solution, and if you want extra insolubility add a small quantity of chrome alum dissolved in acetic acid to the softened gelatine. Read up Mr. Bolas's Cantor Lectures, of 1884 (*Society of Arts Journal*), or get Mr. W. T. Wilkinson's book, published by Messrs. England Brothers, Charles Street, Notting Hill, W.

J. W.—*Surfacing Carbon Prints.* Finding that the lustre is too great when transferred and dried upon glass, could you not squeegee down upon a slightly grained zinc plate, or even try a very finely ground glass ?

Received.—The *Procès Verbaux et Resolutions* of the Paris Conference, and Programme of the Fourth Annual Conference of the Camera Club, to be held on the 20th and 21st inst., at the Society of Arts, under the Presidency of Captain Abney.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1646.—*March* 21, 1890.

CONTENTS.

ALUMINIUM IN PHOTOGRAPHIC APPARATUS.

ALUMINIUM, which was first isolated by Wöhler, in 1827, seems destined to play an important part in the photographic apparatus of the future, because of its lightness as compared with brass, and because of its recent fall in price, due to improved methods of manufacture on a large scale.

Aluminium does not rank with noble metals, such as gold and platinum, since it is more easily attacked by chemical reagents; for instance, it is acted upon by acetic and several other vegetable acids; this, however, is not particularly in its disfavour, for the same may be said of brass, the alloy with which it will have to compete. Pure air, wet or dry, has no action upon it, but the same cannot be said of wet air containing ammonia, and it must be remembered that ammonia is practically always present in the air of towns, also in the country over manured land. If any traces of chloride of aluminium be left in the metal, due to its method of manufacture, the metal is less stable and more easily attacked by damp and by certain chemical reagents. According to Deville, neither sulphur nor sulphuretted hydrogen has any action upon pure aluminium, either at ordinary or at somewhat high temperatures; but according to Fremy, aluminium decomposes sulphide of silver by uniting with the silver and setting free the sulphur. Sulphuric acid, concentrated or diluted, has little or no action upon aluminium, especially when the metal is pure, neither does nitric acid act upon it at normal temperatures; at the boiling temperature it dissolves it slowly. Hydrochloric acid dissolves the pure metal slowly, and the impure aluminium rapidly; alkaline solutions act upon aluminium rapidly, at the same time liberating hydrogen. When the sample of aluminium contains traces of iron or sodium, it is more readily attacked than otherwise by the solutions of certain metallic salts. A solution of common salt, hot or cold, has little or no action upon aluminium. The metal is attacked somewhat by soap. Commercial aluminium is never chemically pure, but usually contains a little silicon and iron; of late manufacturers have been more successful in eliminating the iron, the presence of which deteriorates its colour. Certain gases are occluded by aluminium, and from it carbonic acid and hydrogen have been extracted.

Aluminium has a bluish white colour, will take a beautiful matt surface, and can be polished and burnished under a suitable lubricant; when pure it has no smell, but when rich in silicon exhales the odour of siliuretted hydrogen. It is easily forged, rolled, or beaten into leaves, and the leaves will burn with a most brilliant light in oxygen gas. Aluminium is easily drawn into wire or tubes, but requires annealing afterwards to become flexible once more; the tenacity of the wire, according to Fremy, is half way between that of zinc and tin, but increases when the metal is hammered. Barlow found the tensile strength of aluminium to be twelve tons to the square inch. It is exceedingly sonorous, and some of its alloys are particularly suitable for church bells. Its melting point is between those of zinc and silver.

At present, the most useful alloy of aluminium in the arts is that with copper, namely, the well-known aluminium bronze, which is tougher than gun-metal, and takes a polish resembling that of gold. The alloy likely to be most useful in photographic apparatus must be one not seriously above the weight of pure aluminium, and a good one for the purpose consists of ninety-five per cent. aluminium and five per cent. silver. We have reason to suppose that some of the aluminium now used in photographic goods on sale in the market is slightly alloyed with another metal, which we guess to be possibly silver. An aluminium-silver alloy in the proportions just stated possesses, according to Tissier, an elasticity which is wanting in the pure metal, also a greater hardness and capability of being polished. An alloy of aluminium with German silver has excellent physical properties, and as this alloy is in the market, it may probably be that used in the portions of photographic apparatus. Any alloy of real silver and aluminium is attacked somewhat by sulphur.

At present, we know of no evidence that aluminium will prove less durable than brass in photographic apparatus, especially if the apparatus be kept dry, and in as pure an atmosphere as possible. Should any

evidence be found, after lapse of time, of galvanic action between an aluminium milled head and an interior brass screw, the action can probably be stopped by keeping the camera in a dry place.

THE CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION.

II.

Before closing the notice of Mr. W. F. Stanley's exhibits, Mr Ferrero's dark slide and changing box combined, for celluloid films, represented in fig. 7, claims attention as a

Fig. 7.

useful appliance for the photographer, provided extended experience in working with it should prove that it has all the merits claimed for it by those who place it on public view; so far as can be ascertained from a passing inspection, we see no reason why it should not fulfil their claims, which are:—(1) Extreme simplicity and absence of anything liable to get out of order; (2) the films are put into the carrier just as they are taken from the packet, no shields or metal frames being required; (3) the films are moved by the fingers—no reliance is placed on springs or the action of gravity, which so often fail to act in changing boxes for glass plates; (4) two qualities of films can be carried in one carrier, and either can be picked out for exposure as required; (5) the operation of changing the films is done in a few seconds, whilst the filling or emptying of the carrier is infinitely more simple than with roller slides.

This Ferrero's film carrier is intended to enable the photographer to carry and to expose two or even three dozen films without having recourse to a dark room. It consists of a box, the front of which is fitted as a dark slide. Inside box a loose board, actuated by a spring, presses the films towards the rebate, whilst a light papier-maché board divides the film which is being exposed from the others, and a similar board placed behind the unexposed films divides them from those which have been exposed. When the film has to be changed, the opening of the lid causes the pressure board to be drawn back to the bottom of the box, thus leaving ample space in which the films can be changed. Attached to the carrier is a bag having two holes, in which the thumb and forefinger are inserted for changing the films. The two finger holes are provided with elastic bands, which exclude all light from the interior of the bag when the fingers are inserted.

Messrs. D. Noakes and Co. have a good show at the Exhibition, and some men at work in the actual manufacture of the mounts of lenses, and other varieties of brass portions of instruments. Moreover, in the evening, when the great display of lantern slides is going on in the adjoining theatre, Mr. Noakes gives a small show of his own at his stall, and employs the limelight for the purpose.

This firm exhibits the simple little gas regulator pictured in fig. 8. It is virtually a fine-adjustment tap, which, when in use, is screwed into the back of the ordinary jet-cock; the rough adjustment is first made with the latter, and the fine adjustment afterwards made with the little regulator; when the regulators are once set to suitably and delicately balance the gases, operations can be carried on for a long time with the ordinary cocks before a fresh adjustment of the regulators becomes necessary. The object of the regulator is to economise gas, and to stop any hissing of the flame. Interiorly it consists of an acute cone working within a similar cone.

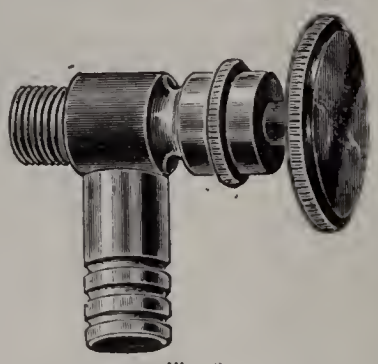

Fig. 8.

The "key camera," fig. 9, as sold by Messrs. Noakes and by the Platinotype Company, is also on view. Some

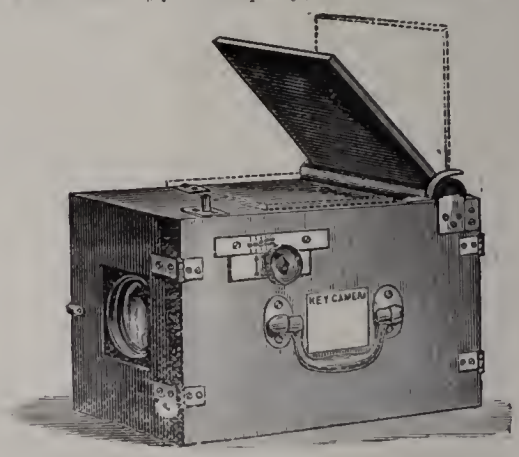

Fig. 9.

improvements have been made in it since it was first exhibited at St. James's Hall last year, as described in these pages at the time. The improvements consist of small modifications to prevent, within certain limits, its getting out of order when carelessly manipulated. The main principle of this ingenious instrument is, it may be remembered, that the plates are kept in little cases which may be carried in the pocket; the plates are introduced into the camera and removed therefrom by passing through a kind of "tap" with an excessively long slot in it.

Fig. 10 may interest lovers of the ideal who have never been behind the scenes at theatres, to see by what methods fairy-land is brought within the view of ordinary mortals, and to give some glimpses, in this matter-of-fact, vulgar age, of the times when fairies danced in the forest glades, and imps swung upon the aspen sprays. It is a limelight lantern, of not particularly romantic form, with a disc in front, carrying circles of glass of different colours. By turning the perforated disc, the stage can be illu-

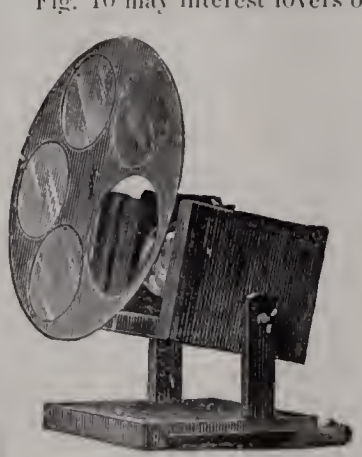

Fig. 10.

minated with any desired colour at the will of the operator.

Messrs. B. J. Edwards and Co. have a stall at the Exhibition in illustration of the results obtainable by orthochromatic photography, and among the most remarkable are yellow daffodils, blue hyacinths, violets, and lilies of the valley, in a yellow vase, taken on isochromatic and ordinary plates. They also exhibit photographs of paintings, in which orthochromatic methods are so valuable, and their isochromatic specimens on view include portraiture, landscapes, and copies of paintings, by leading photographers: also transparencies, lantern slides, and negatives showing difference between isochromatic and ordinary processes. Among these are copies of a painting in the National Gallery, "Bacchus and Ariadne," by Titian (Signor Morelli), and of an oil painting, "Grapes and Oranges."

Messrs. G. Houghton and Son exhibit dark-room specialities, and give occasional demonstrations of the working of Mr. Friese Greene's sensitised cards, in which the positive image is developed upon the card itself, so that no mounting is necessary, and all the operations are finished expeditiously.

Messrs. Sands and Hunter have an exhibit of good photographic apparatus, but no special novelty this year. They have a permanent stand at the Crystal Palace, consisting of a glass case full of photographic appliances.

Sir David Salomons exhibits a rocking-table of a compact nature, with the weight ingeniously placed altogether out of the way of the operator when the latter is performing developing work. Mr. E. G. Platt exhibits photographic brass work: Messrs. Pearson and Denham a reducing camera and circular bellows camera; Mr. W. R. Baker a satchel camera and walking-stick stands; Messrs. Trevor and Co., photographic wrappers; Messrs. Benham and Froud, a dark room lamp with parabolic reflector; Mr. W. F. Slater, picture frames; Mr. A. Clarkson, limelight apparatus; and Messrs. T. Riley and Son, a detective camera. Mr. Henry Crouch exhibits a four-fold stand, with thumb-screws to tighten up the parts; these are easy to manipulate, but are sometimes absent in this class of stand to gain an advantage in packing. Mr. W. Sparks exhibits albums, screens, and frames; Mr. W. Scorer, cameras and lenses; Messrs. T. W. Couch and Co., frames and mounts; Messrs. E. Mander and Son, frames and screens; Messrs. Taylor, Taylor, and Hobson, lenses; the Platinotype Co., platinum prints with demonstrations of the process; Messrs. J. Theobald and Co., lithographic lantern slides with operators at work; Messrs. Justin, Bros., a camera stand of spiral metallic ribbon, which packs into a small case measuring about 8 by 4 inches; and Messrs. Sharp and Hitchmough, photographic apparatus in large variety.

Every evening a lantern entertainment is given at the Palace, with the powerful limelight lantern in charge of Mr W. Brooks. As the screen is a long way off, a projection combination of longer focus and larger aperture than usual is employed. All through the evening last Tuesday the jets were worked without any "roaring," nor was there a hitch of any description.

The following is the list of prizes awarded at this Crystal Palace Photographic Exhibition of 1890:—

Gold Medal for Best Alcove.—Lafayette, Dublin.

Club Challenge Cup.—The Birmingham Photographic Society.

Open to Professional and Amateur Photographers.—Class A, (Sec. 1) Green Bros., Grasmere—Silver medal for alcove. Bronze medals, Class A—(Sec. 1), Anty and Ruddock, Tynemouth, for 560 and series; (Sec. 2) Lyd. Sawyer, Newcastle, for 469; (Sec. 3) Richard Keene, Derby, for 948 and series; (Sec. 3) Henry W. Reeve, for 1,186 and 1,179; (Sec. 5) James E. Goold, Newcastle-on-Tyne, for 568; (Sec. 5) Symonds and Co., Portsmouth, for 1,176; (Sec. 7) Gambier Bolton, Camera Club, for screen, 12; (Sec. 8) J. Pattison Gibson, Hexham, for 470 and series. Class B (Sec. 1). W. W. Winter, Derby, for 199; R. Faulkner, Baker Street, Portman Square, W., for 1,170; B. Scott and Co., Carlisle, for 1,177; T. F. Goodwin, 63, Anerley Road, S.E., for 489 and series; (Sec. 2) W. J. Byrne, Richmond, for 517; (Sec. 6) F. W. Edwards, Peckham Rye, S.E., for 616. Class C (Sec. 1), Frank Sutcliffe, Whitby, for 1,164; R. H. Lord, Cambridge, for 1,143; (Sec. 3) Arthur H. Carnell, Plymouth, for 1,057; (Sec. 7) Walter L. Colls, Barnes, for 1,139; (Sec. 8) Thomas Scotton, Derby, for 1,001; (Sec. 9) H. J. Godbold, St. Leonard's-on-Sea, for 1,166. General—George Thompson, Liverpool, for 222.

Open to Amateurs Only.—Lady Amateur Class (Silver medal)—Miss Clarissa Miles, Malmesbury, for 80, 81, and 82. Bronze medals—Class AA (Sec. 1), G. H. Catt, Spettisbury, Dorset, for 1,225; (Sec. 3) Court Cole, Folly Bridge, Oxford, for 891 and 892; Rev. W. Mann, M.A., S.C.L., Bristol, for 1,322; (Sec. 5) Martin J. Harding, Shrewsbury, for 870; T. J. Bright, Gipsy Hill, for 862; Surgeon A. G. Newland, I.M.S., for 1,035 (for photographs taken under great difficulty); (Sec. 8) J. L. Mackrell, Fairfield, Liverpool, for 256 and 257. Class AB (Sec. 2), J. E. Austin, West Court, Detling, Maidstone, for 814 and 815. Class AC (Sec. 1), E. C. Middleton, Birmingham, for 414. General—W. Jerome Harrison, Birmingham, for 401 to 406.

The judges also recommend that a complimentary medal be awarded to Mrs. Rejlander for the exhibit of her late husband's art studies.

Owing to the large number of lantern slides in competition, awards in the Lantern Division cannot be published this week.

PHOTOGRAPHY AT THE ROYAL METEOROLOGICAL SOCIETY.

Last Wednesday night a meeting of the Royal Meteorological Society was held in the theatre of the Institution of Civil Engineers, Great George Street, Westminster, with Mr. Blanford, F.R.S., in the chair. In another part of the building was an exhibition of instruments illustrating the application of photography to meteorological purposes; also an exhibition of photographs of meteorological phenomena.

Mr. G. M. Whipple, Superintendent of Kew Observatory, read a paper on "Photography in Relation to Meteorological Work," which was much to the same effect as the memoir he read some months ago before the Photographic Society, and the same illustrations were given by means of the optical lantern, which last Thursday was worked by Mr. Wainwright.

Mr. William Marriott then gave an address on "The Application of Photography to Meteorological Phenomena," during which lantern views from the same negatives from which the chief prints in the adjoining exhibition were taken, were projected on the screen, so that the facts represented could easily be explained to all the listeners present before they inspected the exhibition itself. Some of these photographs were exceedingly curious. One represented hanging against a partition the clothes of two men who had been struck by lightning, but fortunately not killed; one man's trousers had been torn to shreds, whilst one leg of the nether garments of

the other man, simply was less injured, but had the knee taken out, and showed indications of the flash having passed zig-zag fashion from one leg to the other. Some boots burst in all directions formed pitiable objects in the foreground. The old story of lightning sometimes impressing the picture of an adjoining tree upon the body of a person struck by the flash seems to have been founded upon an actual natural fact, for the photograph of the arm of a boy who had been struck by lightning was shown, and it had picturesque arborescent markings burnt on the skin, such markings as inaccurate observers might hastily conclude to represent the branches of a real tree. An excellent photograph representing gigantic icicles hanging from the branches of trees was shown; it had been taken by the Rev. F. W. Stow. Some photographs of clouds taken by M. Paul Garnier, at the Observatory, Boulogne-sur-Seine, near Paris, were also shown, and were considered by the speaker to be the finest specimens of that class of photographic work which the Meteorological Society had yet seen. Photographs of floods, tornados, lightning flashes, and of trees broken by rime frost were among those shown. One photograph showed how a broken tree carried by a tornado had with its stem speared a horse in the side and killed the poor animal: and another, how pieces of straw carried "end on" by a tornado had been partially driven into trees, so as to stick therein like nails. Dr. A. Riggenbach, of Bâle, had sent some photographs of cirrus clouds, which he had taken by means of their reflection from the surface of Lake Sarnen, when he could not get them so well by direct means. He attributed the greater ease in photographing to the partial polarisation of the light by water; this we think to be an error, and that no evidence has yet been produced that polarised light acts differently from other light on photographic films.

THE CAMERA CLUB CONFERENCE.

Yesterday afternoon the third annual Camera Club Conference opened in the hall of the Society of Arts.

Capt. W. de W. Abney, in the course of his presidential address, stated the fact that colour-vision is three-fold with a normal eye, and he thought that the same principle may, perhaps, apply to the sensitive photographic plate. The eye is sensitive to red, green, and violet, and many intermediate visual colours may be compounded of two or more of these three colours. A sensitive plate may be said to take the place of the retina, and the sensitive salts used, to a colour perception. He thought that the photographic spectrum norms of sensitiveness are analogous to the spectrum norms of colour-perception in the eye, or, in other words, that a photographic plate has, in reality, only one, two, or three colour-perceptions, and that all sensitiveness to other colours is due to only partial response of this vibrating molecule to wave-lengths, which differ slightly from those with which it is in accord. A study of the simple mixture of the natural salts favours this view, and he believed that by using this as a working hypothesis, a better understanding of the apparent vagaries in the extent of sensitiveness will be attained. Recently, in *The Standard*, an announcement had been published that the problem of photography in natural colours had just been solved, and that, too, by a printing process. Dr. Eder's name was coupled with this statement as endorsing the discovery, otherwise he (the speaker) would more readily have supposed it to be a specimen of journalistic credulity. Photography in natural colours has long been a fact. He argued that a printed photographic image in natural colours cannot be produced on an elemental substance, so a compound substance must be used. With chloride of silver, as he had proved and published long ago, the spectrum exercised reducing action at one of its ends, and an oxidising action at the other. When photographs in natural colours are obtained, the difficult problem of how to fix them remains. Fixing means the removal of something still sensitive to light, and this removal must at once change the colour, if the colour has been produced by chemical change. If the colour is produced by altered molecular arrangement, that molecular arrangement must also be destroyed by white light. The existence of the power of fixing such images is therefore improbable. He did not believe in the discovery of any really practical method of producing permanent photographs in natural colours.

Mr. A. M. Rossi then read a paper on "The Art of Drawing and Photography," which was followed by a brief discussion, in which Messrs. Adcock, Davison, Dresser, Newman, and Major Nott took part.

Mr. T. R. Dallmeyer then read a paper entitled "Limitations in the Treatment of Subjects by Focus," in the course of which he argued that two of the points set forth in the memoir of Mr. W. K. Burton, read recently before the Camera Club, were erroneous. He said that it is a scientific mistake to state that a photographic lens cannot give a sharper image than does the eye. The authority of Helmholtz was against the assertion, and so were his (Mr. Dallmeyer's) experiments. In testing the matter, it is necessary that the photograph and the view shall be examined under the same angle. Mr. Burton had also stated in effect that the eye will give as perfect a representation as a lens of a near and distant object when viewed at the same time. Mr. Dallmeyer disputed this, and said it was impossible, except by artificial means. To try the experiment fairly, the eye and lens must be placed under the same conditions, and if the eye be stopped down by placing in front of it a moderately large pinhole in a screen, near and distant objects can be seen at the same time with considerable sharpness.

In the course of the discussion upon this paper, Captain Abney expressed the opinion that a good photograph must be sharp all over, and be viewed at the same angle as was the original subject; the eye will then, when viewing one part of the photograph, see the rest of it with the same "fuzziness" as in nature under like conditions.

Mr. A. A. Common, F.R.S., gave a summary of his paper upon "Eclipse Photography," in the course of which he expressed the opinion that eclipses in the future can be observed and photographed by much simpler appliances than heretofore. He suggested the use of one large heliostat, which then would be the only instrument requiring astronomical adjustment, and with it but one driving clock would be necessary for the purposes of the whole expedition. The whole of the different observations could then be made by the aid of the heliostat. The idea, he said, is not new, for small heliostats have been used for somewhat similar purposes, but the impediment of so working on a large scale has been the difficulty of obtaining a plane mirror of sufficiently large size. Now, it is possible to construct a mirror to serve the whole of the instruments. By the adoption of this plan the enormous weight and quantity of packages now taken out by eclipse observers would be greatly reduced.

Mr. Albert Taylor said that during the recent eclipse of the sun, the Americans took out some interesting instruments. Professor Todd took out a large polar axis, eleven feet long composed of two great tubes side by side, and provided with several supports. On this great polar axis he fixed all his twenty-seven instruments.

The President remarked that Mr. Common had for some time past been using mirrors in which the proportion of aperture to focal length was greater than had ever been seen before; he tested his own mirrors, and they were perfection itself. He had just been talking in a jaunty way of making a twenty-inch flat mirror; the difficulties in the way were enormous, but if Mr. Common were to say that he would make a three feet plane mirror, he would afterwards do it. He (Capt. Abney) believed that Mr. Common had found out how to overcome one of the greatest difficulties opticians had in making large flat surfaces.

Mr. H. Trueman Wood then took the chair, and Mr. W. Wilkinson gave a demonstration of the working of the colloty process, and gave explanations of the chief points connected therewith.

To-day (Friday) the Conference will be resumed in the Hall of the Society of Arts at two o'clock. One of the papers is by Lord Rayleigh, on "Photography by the Light of the Electric Spark," relating chiefly, in all probability, to some expe

ments of his recently performed at the Royal Institution, in which the drops into which a large vertical jet of water burst, at some distance above the nozzle of the delivery pipe, were proved to amalgamate to a certain extent by the proximity of a neighbouring electrified glass rod. The great water-jet is exceedingly sensitive to electrical action, indeed more so than a gold-leaf electroscope; the drops showed a tendency to amalgamate even when the rod was excited at a distance from it of several yards. To photograph the varied dimensions of these drops, an extraordinarily short exposure was necessary, and this was effected by means of a single spark from a powerful battery of Leyden jars—the means, indeed, by which Fox Talbot half a generation ago, in the same theatre, photographed printed matter upon the rim of a rapidly-revolving wheel.

This evening the annual dinner of the members and friends of the Club will take place at the Frascati Restaurant, Oxford Street, London.

PHOTOGRAPHY IN NATURAL COLOURS.

Last Tuesday's *Standard* contains the following telegram from its Vienna correspondent:—

Dr. Eder, Professor of the Photographic Institute of Vienna, has announced that a photographer named Veresez, living in Klausenburg, Transylvania, has succeeded in solving the problem of photographing in natural colours. Up to the present, only the shades between deep red and orange can be retained, and even these, if exposed to the light, fade in from two to three days; but the experiments are being continued, with good prospects of complete success.

The *Standard* has a leading article upon this telegram, in which, on the face of it, there may be nothing which photographers have not known for years; the only thing which suggests that there is something new in the invention but missing in the telegram is, that Dr. Eder gives the weight of his name to something which has been done.

Some correspondence about this telegram has since been going on in the *Standard*, in which journal, on Wednesday, the following letter appeared over the initials A. J. M.:—

I have read with much interest your leader on "Photographing Natural Colours," as well as the telegram from your Vienna correspondent, and, comparing the two, I cannot help feeling that you think rather too much of Herr Veresez's discovery, for it appears that all he has done as yet is to get red and orange, which may be only a lighter or brighter shade of red. Now, if this is the extent of his "discovery," I can claim to have done as much, and more, in time so remote as to make me feel that I must have passed the "bloom of youth." In the early days of photography, I had much experience in the Daguerreotype process, and have often produced portraits in which, while the black coat has been black, the face has been a natural flesh tint, and the background or sky a clear light blue. This has occurred mostly when the light was particularly actinic; it was the result of no discovery, but came naturally, and if there should be any others still living who practised that ancient art, they can doubtless testify to a similar experience. It is my belief that the only way in which photographing natural colours can ever become an accomplished fact is by the discovery, not of a method of producing mere colour by light, for that has been done again and again, but of a sensitive film that will give the complementary colours, so that the red would give in the negative an equally decided or undecided green, and the blue a corresponding orange; then in printing from such a negative the colours would be again reversed, and so faithfully portray the original natural colours. But of such a discovery your correspondent gives not a hint. You refer in your article to our greatest authority in these matters, Captain Abney, and one would much like to know what he thinks of the "discovery."

Yesterday the following letter from Capt. Abney appeared in the *Standard*:—

In your Leader of yesterday, and in your Correspondent's letter signed "A. J. M." of to-day, a reference has been made to myself as regards Photography in Natural Colours. May I be allowed to say that the description given by your Vienna Correspondent of the discovery made by Herr Veresez is not such as to favour the idea of any advance in such a branch of photography having been made? Photography in natural colours has been an accomplished fact for years past; but to render such colour permanent and unaffected by exposure to white light is a problem which is almost, if not quite, on a par with that of perpetual motion from a physical point of view. I am dealing more fully with the question to-morrow in my Presidential Address at the opening of the Camera Club Conference at the Society of Arts, and will not anticipate my remarks.

Yesterday also, J. T. wrote to the *Standard* as follows:—

I have shared in "J. M.'s" experience. A really good Daguerreotype always seemed to bear a suspicion of colour, and once, by purely accidental circumstances, I obtained veritable colours. I remember it was an Autumn day, one-half the overhead sky was bright, but angry clouds, from which came frequent electric discharges, obscured the rest. My sitter was gaily attired in a black silk gown, checked with green, red, and a narrow yellow stripe. All being ready, the then rather impertinent warning was given, "Now, madam, sit still if you please, and don't wink." The roar of the rain was at hand, the cap was removed, when the lightning and thunder crash came simultaneously. My subject jumped up with a squeal, and ran away to the house. I had little thought of anything but a failure, the exposure having been interrupted. My astonishment was great, on "bringing out" the picture, to find I had a beautifully delicate, naturally coloured Daguerreotype. I kept my treasure, and many saw it; but after some months the colours faded away. On mentioning these circumstances to a clergyman, he told me that, whilst receiving lessons in photography at the Polytechnic Institution, London, during a violent thunderstorm, a coloured image was imprinted, not upon the plate, but upon the lens of the instrument. These, and other facts with which I am acquainted, seem to point to electricity as a means of producing naturally-coloured pictures.

Yesterday we received a letter on various subjects from Dr. Eder, in which he said nothing about any recent great discovery in photography.

A New American Photographic Journal.—We have received No. 1 of *The Photographic Globe*, a monthly journal, devoted to the artistic and scientific advancement of photography, edited by Maximilian Toch, and published by the Photo. Globe Publishing Co., New York. The editor says:—"In adding another journal to the sterling issues of its kind, we beg to make our obeisance, and repeat the words of the old proverb: 'There can never be a superfluity of good things.' . . . It will be our aim to publish succinctly the discoveries and inventions as they are produced, and to lay aside those intricate, abstruse, and subtle topics which to the majority of the profession are unintelligible." The frontispiece is a print on "Diamond Extra Brilliant Pense Albumen Paper," from a negative by E. C. Dana.

Exeter Hall Camera Club.—A photographic society thus entitled has been formed in connection with the Central Y.M.C.A. The Club has been divided into two sections, to one of which ladies will be eligible for membership. The following advantages and privileges, amongst others, are offered to members:—Use of dark rooms to be constructed in basement at Exeter Hall; popular and instructive lectures on photography; out-door excursions for the study of landscape photography; facilities for exchanging photographs, and purchasing apparatus and chemicals at cost price; and periodical exhibitions by members, besides ordinary meetings from time to time. Those desirous of becoming members should communicate with Mr. G. J. Ingram, Hon. Sec., Exeter Hall Camera Club, Exeter Hall, Strand, from whom also full particulars may be obtained on enclosing a stamped directed envelope.

PHOTOGRAPHY IN ROME.

The Association of Amateurs of Photography in Rome, located in Via Poli, 25, publishes every two months a *Bulletin* of photographic news interesting both to the amateur and the professional. The *Bulletin* was born on the 15th May of last year. The number for January of the present year contains a photographic illustration by Carlo Rocchi, of a highly picturesque character, taken from the plantations of chestnut trees which surround Rocca di Papa—of this the heliotype has been executed by Martelli. The number also gives a report of the proceedings of the general assembly held on 26th January in the present year, an article on orthochromatic plates by E. and F. Boissonas, some photographic *causerie* or chit-chat by Giovanni Gorgiolli, together with a bibliography and occasional notes of a varied character.

The assembly held on 26th January was presided over by Augusto Ducros, the vice-president of the Association. Carlo Rocchi read a paper in which, after mentioning the friendly relations which subsisted between the Society at Rome and the Societies of Florence, Naples, and Milan, he stated that strangers interested in photography passing through Rome might avail themselves of the hospitality of the society of which he was a member, and obtain photographic assistance and appliances of which, as travellers, they might be destitute. The following were then formally elected members of the council of administration of the Association:—Don Antonio Ruffo, Augusto Ducros, Ing. Giovanni Gargiolli, Carlo Rocchi, Don Prospero Colonna, Cav. Enrico Valenziani, Edoardo Kowalsky, Conte Guiseppe Primoli, Bruto Marini.

The article which its author, with sufficient modesty, calls Photographic Chit-chat, is the continuation of another which treated of the relations of photography to painting and sculpture. That architecture also may be profited by the camera is, says the author, sufficiently clear. The reproduction of monuments, with their details of geometric design and accurate perspective, may be of the greatest service to the architect; but careless pictures, such as those too often seen in the shop windows, are worse than useless. Before all things, it is necessary that the photographic artist should be an adept. "How often," says Gargiolli, "is an eyesore found in a falling monument, in hanging columns, in a disfigured capital, in a door or window larger below than above, not to mention false and badly arranged effects of light and shadow, defects not indeed of photography, but of the photographer."

To enumerate all the useful applications of the photographic art to the reproduction of machines and instruments of every kind, and the many advantages it might lead to in the industrial arts—as, for instance, in the matter of furniture and decoration—would, says the author of the article, be too long a matter for the present *Bulletin*. He particularises, however, the great use of photography in obtaining enlargements of pictures of microscopic preparations. The secrets of the world of the infinitely little are hereby laid bare to the interested spectator. Medicine, surgery, anatomy, botany, mineralogy, and all the natural sciences have in the application of photography their firmest and most useful support. Suppose, says Gargiolli, we have a case of building; suppose the engineer has to furnish the directorate with a relation of his monthly progress. What could do this better than a photograph of the edifice at the end of every month? This would show at a glance its exact state and advancement, and finally, when all these pictures were collected together at the conclusion of the work, they would give an exact chronological story of the whole construction.

In the army, photography would be of the greatest service if the principal officers were previously instructed in a special photographic school. It would afford an exact and complete view of forts, bridges, trenches, and other military appliances, of the position of the troops, and of the different localities, for the Ministry to consider at home. I am of opinion, says the author, "that the army would derive no small advantages from a rational exercise of photography, a fact which is demonstrated by the dispensations made in this regard already by the military councils of many nations. What has been said of the army applies equally well, in the author's opinion, to the navy. But he says, photography is with us in no great credit; it is considered generally a mere trade if exercised by the professional, or if by an amateur a mere diversion for idle people. "This," says he, "is false, aye, most false." And, he adds, the absolute negligence of our Government in this respect is deeply to be deplored. In Vienna, Berlin, and other great towns, institutions for teaching photography are provided by their governments, universities, so to speak, furnished with cabinets, laboratories, and everything which is theoretically or practically necessary to the development of the art, while we Romans have nothing. Such instruction cannot, in the opinion of Gargiolli, be given adequately by the professors of physics in the lyceums and universities. Their pupils could obtain little more than a superficial smattering, a collection of wandering, disconnected ideas from the few lectures on photography that any professors would be able, having regard to their other duties, to deliver. But if the government were to establish a school of photography the different parts of the Ministry—as those connected with war, the navy, public works, agriculture and commerce—would all be interested in its maintenance. All these might avail themselves of its services. Even the police might gain something by the detection, through its means, of a criminal, a "person wanted."

"Then could the Government," says Gargiolli, "have such photographs as it desires properly executed, and not be obliged to content itself with such daubs and enormities as are at present too often the result of the labours of the first photographer who happens to be at hand. The Ministry of Public Instruction would find their advantage therein with the production of ably executed works, which might serve for schools of industrial art and academies of design."

The author concludes this interesting article with two scenes from his own experience. He wanted to obtain, on one occasion, permission from the Ministry of Public Instruction to execute photographs of certain monuments for his own private use and gratification. He obtained, after some little delay, a reply that it was impossible to give him a general licence, but that he would be allowed to copy any specified objects if he would first give notice of such objects to the Ministry, and afterwards send them copies of the photographs taken. "I had," says Gargiolli, "no objection to parting with the photographs, but was not altogether content with the other condition, not being a photographer by profession, but a mere amateur who desired the beautiful without any prospect of profit." On another occasion, seeking a photograph of some object of public art which pleased him, several were brought to him by the seller, but all so vilely done, either from a bad

position or a bad light, or a deflection of the vertical lines. that he proposed to take a picture for himself: but as this was strictly forbidden, he departed, shaking the dust off his feet against all monopolies of professionals.

CHROMO-PHOTOGRAPHY BY BLOCK PRINTING.

Referring again to the illustrations in Dr. Eder's annual, we find—in addition to the zincographic print from 18 plates, which we described last week—two further examples of printing in several colours on the same paper. In both of these cases there is the important fact that block printing in high relief is the process employed, and some interesting details concerning each method are to be found in the work in which they are contained.

The first example to be noted is a copy of a subject printed in red—or rather a sort of terra-cotta colour—and black. It represents a figure in arms on horseback, and is a very effective production. There are three impressions—one of the subject in black outline; one of the general terra-cotta tone, which in the finished print covers all but the high lights; and one of the two combined. The method by which the separate negatives are obtained from the parti-coloured original is ingenious though simple, and is described by Professor Roese, of the Imperial Printing Establishment in Berlin, from whose account we extract the following details.

For coloured reproductions, as many negatives are taken as there are colours to be used. For the purpose of producing the particular illustration under discussion, two negatives are made. The one negative—that for reproducing the black outlines—receives a very long exposure, and is best effected with an orthochromatic plate. By this means the red terra-cotta colour produces so much effect on the negative that it classes with the white, and leaves the black lines remaining wherewith to produce the zinc plate that is to print black. For the "tone plate," on the other hand, such a short exposure is given that only the white lights show distinctly, and the red is classed with the black.

In this way are made facsimile reproductions either of the original size, or on a smaller scale, from coloured wood engravings. In the Imperial Printing Office in Berlin there is a large collection of reproductions from coloured works, as well as black and whites, of the old masters in wood engraving:—Jan Livens, Hans Balding Grien, H. Burgkmaier, Albert Durer, Joh. Vechtlin, Lucas Cranach, Andrea Andreani, Tobias Stimmer, Urse Graf, H. S. Beham, Schauenfelein, Altdürfer, &c.

The other example of chromo-zincotype contained in the book is a print in four colours, reproduced from a sketch in oil colour by Kotschenreiter. The print is by Meisenbach and Schmaedel, of Munich, who use the word "autotype" in connection with the zinc-etching processes that they employ. The picture represents a weather-beaten head, and is very effective both in drawing and suggestive colouring.

On the subject of autotype colour printing—by which, as above mentioned, the idea associated in the minds of English readers with the word autotype must not be connected—we have an article in Dr. Eder's book by G. Fritz, Technical Inspector of the State Printing Office in Vienna. Much more highly than black and white reproduction, says he, must be esteemed prints in chromo-autotype, for by its application it is possible to secure a truer representation of the originals, both in drawing and correct rendering of colour, than by any other method hitherto known. Water colour drawings, however, lend themselves better to reproductions, by the block photo processes, than do oil paintings. The latter often require a large number of colour plates, and to represent their solid effect many tones must be overlaid on the same place, whilst water colour paintings and other pictures that are painted in a similar style, are, on account of the generally transparent character of the tones, much better within the reach of the typographic printer's art. Each method of printing has its own characteristic, and typographic or block printing is less suited than the copper etching, lithographic, or collotype methods for representing the deep, powerful, solid effects commonly found in oil paintings.

ANOTHER PHOTOGRAPHIC SURVEY.

The Manchester Amateur Photographic Society has inaugurated a photographic survey of Manchester and Salford, and its Secretary has sent the following letter to each of the members of the Society:—

"Dear Sir,—I beg to inform you that the Committee are now making arrangements for carrying out this scheme. April and May being considered the best months for taking street scenes and some of the objects suitable for the survey, it is imperative that operations should begin at once. At the present stage I cannot give you details of our plans, as these will depend upon the number of volunteers we get to assist us. It is intended to photograph street scenes, prominent buildings, market places, railway stations, churches, interiors and exteriors, old bits of architecture, interesting nooks and corners, especially those doomed to early demolition, parks, historical residences, including those in the surrounding neighbourhood of Manchester and Salford, and having connecting associations; also instantaneous views, such as Fairs and 'High Change;' in short, anything that will record the city and borough and the habits of the people, as they are to-day.

"I need not point out to you that this is a vast undertaking, and one that will require our full strength. But we are a large Society, and if every member will take his share of the work, the divisions will be very small. If, however, it be left to a few to perform, the survey will be a burden. I hope you will do your best to obviate this by helping us.

"To take an ordnance map and cut it up into slips, giving a piece to each member to mark his circuit, would be rather arbitrary in a voluntary work of this kind. It is considered better to leave it to the members to photograph whatever and wherever they choose, and to send in the results for selection by the Committee. But apart from this, the Committee will collect the names of all the places and objects to be taken, and make an allotment to each member, for which he will be held responsible to photograph at his earliest convenience.

"In the binding of the survey, the artist's name will be written under the print, and at the completion the negatives will be returned to their respective owners. I shall be glad to communicate with any member respecting the scheme, and hope to give fuller information in the next number of the *Record*.

"Will you kindly give your best consideration to the questions at foot, and let me have your replies not later than Monday's post, and oblige,

"John Wilcock, Hon. Secretary.

"335, *Moss Lane East, Manchester, March 6th.*"

THE SIZES OF PHOTOGRAPHIC PLATES.*

BY J. CRAIG ANNAN.

The question whether the sizes of plates and papers at present adopted by British manufacturers are the most economical that could be devised, is a subject worthy of careful consideration.

How the present sizes came to be fixed I do not precisely know. The terms whole-plate, half-plate, and quarter-plate have the ring of a convention about them, and may have been fixed by some photographic parliament in days long gone by. Plates $8\frac{1}{2}\times6\frac{1}{2}$ were the largest size prepared for Daguerreotypes, and probably were then known as full plates, and this may be the origin of the term. Other sizes appear to have been designed by the makers of cameras in a haphazard way, as their fancy or expectancy of custom led them. What I wish to discuss to-night is, whether the proportions of length and breadth in the standard sizes of British plates are the most economical that could be devised? I think most certainly they are not, and I would like very much to see this subject taken up by the International Congress which is to meet this year in Brussels; for the double reason that an international series of sizes might be fixed, and that they should be arranged on some reasonable basis.

In a communication to this Society about five or six years ago, the late Mr. Norman Macbeth, R.S.A., laid down a rule to find the best proportions of length and breadth for a picture, the resulting proportions being $\sqrt{2}\times1$.

Now, while maintaining that the ultimate proportions of a print must depend entirely on the composition of the picture, I have become firmly convinced that this shape is the most useful and economical that could be found for general work.

Compare this size with those in use.

$\sqrt{2}\times1 = 1{\cdot}41\times1$	$8\frac{1}{2}\times6\frac{1}{2} = 1{\cdot}31\times1$
$15\times12 = 1{\cdot}25\times1$	$7\frac{1}{2}\times5 = 1{\cdot}5\times1$
$12\times10 = 1{\cdot}2\times1$	$6\frac{1}{2}\times4\frac{3}{4} = 1{\cdot}37\times1$
$10\times8 = 1{\cdot}25\times1$	$6\frac{1}{2}\times4\frac{1}{4} = 1{\cdot}53\times1$

A glance at the list shows that nearly all the sizes are less oblong than the Macbeth proportions, the modified half-plate $6\frac{1}{2}\times4\frac{3}{4}$ being nearer it than any other. Consider for a moment, and I think you will find that in nine cases out of ten in trimming a print from a 15×12, 12×10, or even whole-plate negative, you have to cut more off the breadth than the length to make the shape look pleasant, and that a half-plate oftener than any other size is a suitable shape as it stands.

Compare this size also with the artists' canvasses which have the largest sale.

$\sqrt{2}\times1 = 1{\cdot}41\times1$	$10\times7 = 1{\cdot}43\times1$
$18\times12 = 1{\cdot}5\times1$	$20\times16 = 1{\cdot}25\times1$
$14\times10 = 1{\cdot}4\times1$	$18\times14 = 1{\cdot}28\times1$
$12\times8 = 1{\cdot}5\times1$	

These two last sizes are for portraits, head and shoulders, and are of course squarer than an average picture would be.

And now I wish to point out the most interesting and useful feature of this shape, which is that, when it is doubled, the relative proportions are precisely maintained. $1 : \sqrt{2} :: \sqrt{2} : 2$.

You will at once see the manifold advantages of a series of plates based on a principle such as this. And as this paper is not intended to go fully into the subject, but is written more for the purpose of raising a discussion on what I consider a most important matter, I will conclude by giving a list of sizes on the lines which I would like to see carried out. Of course if an international series were fixed, they would be worked out in the metric system.

$4\frac{1}{4}\times3$	$12\times8\frac{1}{2}$
$6\times4\frac{1}{4}$	17×12
$8\frac{1}{2}\times6$	24×17

As the sizes become large, the difference between them is too great, and intermediate sizes would be required.

7×5	20×14
10×7	28×20
14×10	

* A communication to the Glasgow Photographic Association.

PEOPLE WITH DOUBLE FACES.

Mr. Napoleon Sarony's observations on the human countenance, to a *New York World* reporter, run thus:—

"Perhaps you are not aware of the fact, but, unless you are entirely different from the rest of humanity, one side of your face is unlike the other. Doubtless nine persons out of ten would not notice the difference, but it is there, and if you make a careful study of the profiles of your friends' faces you will find it in a more or less marked degree in every instance.

"This peculiarity of nature was called to my attention when I entered the practice of photography. Previous to this time I had been an artist and lithographer, and naturally had been led to study the human figure with more or less care. I had discovered this incongruity of nature, if it may be so called, but it was not until I began posing models before the camera, and had every line of the face emphasized, that this idiosyncrasy became more apparent to me, and I set to work to discover the cause; for, of course, there is a cause for everything, the human face included.

"My first discovery was that the difference in outline lay almost invariably on the two opposite sides of the nose. The right side, for instance, might be pure aquiline, and the left show a decided inward curving line. This difference I found in many instances had been caused by accidents, such as had been received in wrestling, falling, being struck by a ball, or other misfortunes which youth is heir to. There is an indentation on one side of my own nose, caused by a blow from a ball, and it renders the expression of one side of my face almost entirely different from the other.

"But accident is not the principal cause of these facial differences in humanity. Not by a great deal. It traces way back to the cradle. Mothers find that their infants will remain quieter when they are sucking their thumbs, and for peace in the household they very often lay the foundation for what becomes a deformity in after life.

"Let me explain: Baby lies in her cradle as still as a mouse. Her chubby little thumb is held between her rosy lips, and the forefinger is pressing the cartilages of the nose on one side. It is that little forefinger that is doing all the mischief, for it is slowly, but surely, pressing the cartilage out of shape. If drops of water wear away a stone, surely constant pressure will indent a human face."

Photographic Club.—March 26th, monthly lantern night; April 2nd, "Standard Solution and the Expression of Photographic Formulæ."

A MODIFIED COLLODION EMULSION.

BY A. PEEBLES SMITH.

That collodion methods are but little used in the production of lantern slides by amateurs goes without saying. "Takes too much time—costs too much." One might say that emulsion making was the thief of time, and chemicals. It is not only this; but time is the thief of emulsion, especially in the amateur's hands, as he can only use a small portion at a time, and the emulsion becomes of the consistency of water with age—entirely useless. To gain time and prevent collodion emulsion from sinking into the silver waste, or oblivion, and to show its cheapness, is the purport of this article.

Before acquainting the reader with the rapid ten-minute method, possibly a description of the actual practice heretofore indulged in, and its subsequent cutting down in time, and the preserving of one's good nature would be of interest.

In the first place, to make an emulsion by collodion methods, it is essential we have some bromo-iodised collodion. The formula in use is as follows:—

Collodion.

Alcohol	1½ ounces
Ether	2¼ ,,
Gun-cotton	40 grains
Iodide of ammonia	15 ,,
Bromide of cadmium	54 ,,

First take the alcohol and dissolve the iodide in it. Take next your bromide and grind it in a mortar, adding a few drops of distilled water. Now pour the combined alcohol and iodide gradually into it, grinding constantly until nearly all the bromide is taken up. A slight precipitation occurs, but if well ground will be very small, and of no serious consequence. Gradually add the ether to the alcohol, iodide, and bromide, shaking it with a kind of circular motion. Add the gun-cotton; filter it through a tuft of cotton saturated with alcohol, and put away to ripen for a week. If white iodide is used, and the collodion does not become a deep cherry colour, by adding two or three drops of iodine the collodion will be in prime condition for sensitising.

Sensitising.—Dissolve in a test tube by gentle heat 75 grains of nitrate of silver in one dram of distilled water, adding 4 drams of alcohol, which has previously been heated in another test tube. Now go into your dark-room, and by orange light gradually add the alcoholic solution of silver, giving it a vigorous shaking after each addition, finally rinsing the test tube with 2 drams of alcohol and adding it to the emulsion. After shaking well, add to the finished emulsion three drops of nitric acid. Care must be observed to keep silver solution heated, else precipitation will be the result, and though it may not spoil the emulsion, the bromide of silver formed will be in a very coarse state, making it useless for lantern positives.

It will be observed from the foregoing that to make an emulsion we merely make bromo-iodised collodion and sensitise it. In other words, we take the collodion of the old wet process and fire the silver bath into it. Well-ripened bromo-iodised collodion can be obtained in eight-ounce bottles from any of the leading photographic stock-houses, at a less cost to the purchaser than the amount of bromides, iodides, ether, and alcohol, necessary to the making of the same amount of collodion. Provided with an eight-ounce bottle as above, take four ounces of its contents and follow the instructions given in this article about sensitising, and the result is a collodion emulsion which should not have taken more than *ten minutes* to complete. Emulsion so made does not keep for any length of time: nor does the amateur so wish it, as he is compelled to work spasmodically.

Make the emulsion the evening before the day you intend using it. Secure a slab of plate glass; level it, covering its surface with well cleaned albumenized glass, 3¼ by 4. Measure out 1½ drams of emulsion; pour in the centre of each plate. When the surface becomes tacky, wash in two or three changes of distilled water; allow the plates to soak for two minutes in a tincture of quinine of the following strength:—

Water	5 ounces
Tincture quinine	2 drams

Wash again in distilled water, and dry by gentle heat. When dry the plates are ready for exposure. The albumen solution is made by dissolving the white of an egg in three pints of water, and filtering through cotton saturated with alcohol. It is best to filter the emulsion at the time of coating the plates. If four ounces of collodion make more emulsion than can conveniently be coated for use the following day, cut down the formula, preserving the proportions, thereby saving loss of emulsion and time in coating plates.

Having exposed the plate, we now take up its development. The exposure should be about four times as long as that given a very slow gelatine plate. One point to be remembered in the development of collodion emulsion is that it cannot stand a very great amount of alkali. The slides shown at the Society of Amateur Photographers were developed with eikonogen in the following proportions:—

Eikonogen	2 grains
Water	1 ounce

The alkali was *one drop* of a saturated solution of carbonate of soda. Previously to applying the developer, the plate was soaked in a solution of alcohol two parts, water one part. After fixing and washing, the plate is intensified with pyro and silver, as used in wet process, with proportions as follows:—

A.—Pyro	24 grains
Citric acid	24 ,,
Acetic acid, No. 8	¼ ounce
B.—Nitrate of silver	40 grains
Citric acid	10 ,,
Water	8 ounces

If old ferrous oxalate developer is used, no intensification is necessary; but eikonogen tones are unsurpassed, even by the carbon process.—*American Amateur Photographer.*

North Middlesex Photographic Club.—On Monday next, March 24th, Mr. Smith will give a lecture on "Micro-Photography," and illustrate it by means of the optical lantern. Visitors invited to attend.

Brighton Photographic Society's Syllabus.—Address by the President, March 25. *Excursions*—Shoreham, April 26; Newick, May 26; Steyning, June 28; Isfield, July 26; Hayward's Heath for Balcombe, August 30; Lancing for Sompting and Broadwater, September 13. *Lantern nights*—April 8, November 11, December 9. *Papers*—Mr. Jago, April 22; Mr. A. H. Corder, "Platinotype," May 13; Mr. Hethton Lewis, June 10; Mr. E. J. Bedford, "Composition, Light and Shade," July 8; Rev. H. G. Day, "Photography considered in its Relation to Art," August 12; Mr. A. Webling, "On Exposures," September 9; Mr. F. Tate, October 14; Mr. D. E. Caush, "Failures," October 28. Social evening, Nov. 25.

Notes.

In France the study of composite photography has been taken up with great enthusiasm, the specimens exhibited in the International Exhibition giving some remarkable results, as we mentioned some time ago. A very thoughtful article appeared in *La Nature* recently, and is well worth perusing by those interested in the subject. The method pursued in France differs considerably from that first put forward by Mr. Francis Galton. Mr. Galton produced his composites in the printing-frame; the French workers produce theirs in the camera by a succession of exposures. The writer's theory is this:—The variations in the features of each photograph being given an insufficient exposure, do not print; the features which are common to all the photographs receive the proper exposure because they occur again and again. Hence these salient lines alone printing, we get the type of the particular collection of individuals. An objection has been raised to this method on the ground that the plate becomes more sensitive the more often it is struck by feeble light; consequently those portraits last exposed will have a predominant influence in the final result.

This objection, the author shows, by a series of experiments difficult to explain without the diagrams and pictures which accompany the article, has no force if the operations be conducted properly. The conclusion the writer comes to is that the larger the number of subjects in each composite, the greater the probability of obtaining a real type. When a small number—say three—is taken, there is a risk of generalising too much, and as the exposure in each case is but a third of the normal exposure, it is sufficiently long to give details which are not common to these faces, and the consequence is we get not a combined result, but a super-imposing of the three. A very brief exposure is insisted upon as indispensable to obtaining a trustworthy result.

A new work on London is about to be brought out by the Religious Tract Society, and the editor has made an application for permission to inspect and photograph certain of the charters and documents in the Guildhall Library. The application was granted by the Court of Common Council at its meeting last week, and under the directions of the town clerk such charters and records as may be desirable will be photographed. This application suggests the propriety at some time of setting up a proper studio at the Guildhall Library, and of appointing an efficient photographer. At the present moment we know of more than one illustrated paper which would be glad to have photographs of old engravings and wood-cuts for reproduction, were it not for the trouble and expense of employing a photographer. If an ordinary business charge were made for such copies as might be required, the expenses of a Corporation photographer would soon be paid. There are many other useful things which such an official could perform, and the City might do worse with its superfluous cash than devote a portion to such a purpose.

The question is sometimes asked, why do some photographers so excessively retouch the negative as to in many cases effectually destroy the likeness? An excellent answer is to be found in a little story which has found its way here from America. A lady of an uncertain age, and still more uncertain looks, interviews a photographer's youthful assistant on the subject of being photographed, upon which there is the usual stipulation made that payment must be in advance. Lady: "But suppose I pay for them and don't like them, what am I to do?" "Don't know, ma'am; Mr. Blank is out just now, but he'll be in soon, and will tell you." "That seems to me a very queer rule; you ought at least to guarantee satisfaction." "Yes, but you see, ma'am, there ain't no way to keep pictures from lookin' like the people." Truthful lad! But this was in the old days. It is now quite possible to keep the pictures from looking like the sitters. We retouch.

The Oberammergau Passion Play is enacted the first year of every decade, and thousands will flock to the Bavarian Hochland in May, on the 26th of which month the performance—we presume we must call it—takes place. Whatever may be the feelings of the audience, the performers at least conscientiously regard the affair in a religious light, and so sacred do they think it that they will not allow the Crucifixion scene to be photographed or otherwise depicted. In this they show better taste than did the American minister who lately preached on Mars Hill—where St. Paul preached his sermon to the Athenians—and had himself photographed in the act!

According to the *Globe*, the head waiter at a long-established and well-known restaurant is a capable amateur photographer. The fact has come out *apropos* of some pictures which appeared in the *New York Herald*, "by which William's genial countenance was grievously libelled in six several pictures." The *Globe* recommends the "waiter-photographer" to have his revenge on the *Herald* artist when he comes to the restaurant again, and "shoot" him—photographically, of course—on the feed. We may remark, *apropos* of that mysterious man the waiter, that the oddest discoveries are apt to be made concerning him. We recollect finding in the head waiter at a quaint old inn at Canterbury an accomplished microscopist, and an authority on infusoria. With all his scientific reputation—for he was well known in London—he was modest, and gratefully took his tip in the proper professional manner.

GRADE IN PROFESSIONAL PHOTOGRAPHY.

BY H. COLEBROOK.

Scarcely another business can show so many widely distinct and varied grades as photography, and a study of no mean interest may be found—to those who care about such things—in the links and connections which bind the highest to the lowest, the Court photographer to the beach-man, wide as is the difference between them. It would almost seem, from the countless numbers of existing grades, that each professor of the art finds for himself an original position, so forming a grade of his own; and further, were it possible for a man to ascend, by gradual progression, through these many divisions, from the lowest degree to the highest points, it may be imagined that the extent of his improvement would scarcely be patent to himself. It is only by selecting, for comparison, points fairly wide apart, that any real difference can be appreciated. The comparison of the two extremes would present something truly striking, but the gradual course through all would give little or no idea of progress in photography. There is the difference of taste, the difference of education, the difference of position, opportunity, capital, all influencing that widest difference of all between good and bad photography. For illustration take four representatives from the two extremes, and two intermediate stages.

The "beach-man," as he has already been called in this article—though merely for distinction—will perhaps be better recognised from his description than from his name. There is nothing extraordinary in his being found by the sad sea waves, there is something even appropriate in it. He has many points in common with the seafaring man. His general appearance hardy and weather-beaten, his most prominent feature partaking of the beacon description, his eyes bearing that almost barometrical indication of too much "wet," the effect of shingle and sand giving him a walk peculiarly his own, all proclaim the man. His general standpoint is between two bars—viz., the harbour-bar, if there be one, and the refreshment bar, which there is sure to be. He moves amongst the crowd of pleasure-seekers, bearing in his hand a specimen of work—to the public, a beautiful collodion positive; to the initiated, a silver print set off by a remarkably bright brass mat and tray. His voice, though husky, is skilled in smooth phrases; he is also skilled in argument. He need be, for though his specimen meets with general admiration, the completion of an order is generally accompanied by a little altercation and a large amount of abuse on the part of the customer. His posing is simplicity itself, and the adjustment of his instrument perfectly bewildering in its celerity. The number of his journies to the inland bar would require a clever mathematician to calculate. This is such an undoubted fact, that the ordinary Table of Solubilities appears incomplete without the following item:—

	Temp.	Water	Temp.	Alcohol.
Cash Receipts.	Immaterial.	Insol.	At all T's.	Highly Sol.

His education, taste, and capital may be algebraically expressed as x, y, z, an equation with three unknowns; but whatever else may be urged against him, it cannot be said he lets his opportunities go by. His position must be represented in the trade as zero. The above, of course, is a specimen of the lowest of his class. To say that an honest, conscientious positive worker is not to be found would be extreme, but they are unique in their rarity, and generally seek a quiet spot, where their names cannot be tarnished by the juxtaposition of their unworthier brethren, who, as a class, must be mildly considered as degenerate. Leaving the beach-worker to revel in his alcoholic propensities, and ascending to the nearest quiet street, the representative of the second grade makes his appearance in rather an eccentric manner. Advertisements varying in number from ten to thirty appear in every available space, in shop-window, door, and on the walls of the building, setting forth that artistic portraits can be had beautifully finished at 5s. 6d. a dozen. It is said that a romance repeatedly told becomes gospel in time, even to the romancer. It may be so with these advertisements, the proprietor really believing that what he is continually advertising is indisputably correct. His window is a marvel of uniformity and variety, both. Rows of cartes and cabinets, tier upon tier in symmetrical profusion, lay claim to the one, while the other is evidenced by the wide range of tones, the faces ranging from ghastly to tropical; the mixture of subjects from the sweep to the ballet-dancer; and lastly, the positions, many and easy, the ballet-dancer in particular looking excessively comfortable with one foot on a very high chair. Within we have a good example of that style of unarrangement known as unstudied. Framed pictures lie about as specimens of "Our Club Portrait." The proprietor is suave and polite; his being no grammarian forms not the slightest check to his volubility. The studio is a trifle bare, but with everything in its place—in fact, everything seems to have taken root and grown there. The instruments are in the fullest sense of the word adjustable, though seemingly of an automatic adjustment. Leaving the pose to the operator, it becomes merely a question as to whether you shall hold a lean pedestal up, or whether the pedestal shall hold *you* up. The pedestal being the shakiest, you take the safest course, and after a few mystic "passes" the operator retires to develop. The result is more than successful—it always is—so after a few business formalities have been gone through, and you have resisted the temptation to "Try our Club," you leave, a happy man. In a few weeks' time you are probably a wiser man, and if there is any inclination left to try the effect of any sort of club, without doubt it will be a war club.

Doubling the price of the foregoing example will give us a representative of the third grade, but luckily price will not form the only distinction here. A strong impression that a plain reproduction of a face is not the sum total of artistic portraiture, will be found to exist. The uniformity and variety of the window may be nearly gone, but, strangely enough, there remains something attractive in its arrangement. The quantity of specimens being considerably diminished, the quality is the more apparent. The work shows signs of careful finish, and there is a softness, and roundness, that the eye rests on with pleasure, after its former experience. There is still a uniformity—a pleasing one—in the tone and depth of printing, and a decided taste in the selection and character of the specimens shown. The same principles are found to exist inside. You are not told what a splendid portrait you are sure to obtain, but there is an evident anxiety to prove it, and when you see that there are few or no "clubs" about, you feel there is a possibility, or even a probability of it. Politeness and suavity still exist, but of a more intelligent and educated order,

and this with the trouble and pains that are taken, cause you to breathe as though in a purer atmosphere. There is, perhaps, an eyesore here and there; a straining after unnatural effect, a tendency to bury the sitter in accessories, a want of character, a want of simplicity and greater breadth, but on the whole there seems an upward tendency, and the impression left is certainly more complimentary to the photographer and his art.

The fourth grade has already been spoken of as the "Court" photographer, though this is also merely for distinction, for although many high class photographers have had something of Court work, yet there are many who have not. As I speak of a class, Court must, therefore, be understood in a general sense. There is, or ought to be, a sensation amounting almost to awe in approaching this class, who have reached the summit of many a lesser man's ambition—a feeling that patent leather, and a little more polish, will not be inappropriate. I will endeavour to step lightly and with circumspection.

The first point that would strike an outsider would be the fact that advertisement is either entirely absent, or nearly so. This may prove many things, but amongst others, certainly a sense of security and prosperity, it being unnecessary to attract custom by anything approaching vulgar display, an excellent guarantee that this class do not seek, but are sought. To say that their show rooms, reception rooms, dressing rooms, and studio exhibit taste of the highest order; that even fashion finds its way into their sacred precincts—that everything is of the completest—all this would be superfluous; and to hint at the presence of anything partaking of ordinary vulgarity would be simply to call into requisition sal volatile and eau-de-cologne, and other revivifying necessaries. Though many a lesson might be learnt from these things, they do not form the fairest subject for comparison. The work itself is, of course, the actual test, and this may be seen by all in the form of pictures of celebrities. I do not mean to say that this work is of the highest order of artistic merit—far from it; but as I am speaking of the work of a class, I wish to take a general sample. Something even the reverse of artistic might be found in many, but there is one grand point, that as a whole they exhibit judicious use of the materials of a picture; there is that combination of tasteful simplicity and worth that stamps the photo as coming from one who has an intelligent appreciation of the powers of photography. Much might be claimed in favour of their subjects, but were these subjects submitted to the ordinary retoucher, photographs of very ordinary mortals would be the result in nine cases out of ten. Posing in the hands of this class becomes easy and natural, even though in some cases it be rather studied; but the same pose on an unsuitable subject, in the hands of one of the lower orders, becomes such an awful and horrible perpetration, that it is a wonder that the friends of the latter subject do not take sudden and immediate revenge. The imitator doubtless has the same idea, but without the feeling that prompted it, and herein lies the strongest distinction of all, for were there no room for the influence of thought and feeling, then a distinct line might be drawn to represent the limit within the reach of all, bearing little or no room for comparisons.

Now, by joining these four examples, and carefully filling in the space between each, an uninterrupted succession of degrees will be shown from first to last, each degree at the same time possessing *something* original and distinct. From this I want to show that, collectively, progress is evidenced; individually, the reverse. Take, for example, the case of a man starting a business in one of the intermediate stages. He will naturally open according to his ability, but will have still more regard for his capital and surroundings, this point governing his charges. If he be a conscientious worker, he will give full value for money. Having established a connection—which, needless to say, will take time—can he advance his prices so as to improve his work? for he cannot do it otherwise. But rarely; for he cannot do this without a general upset of his whole business, and a fresh start, as it were, on a new basis. On the other hand, there are many things likely to influence him in lowering his prices, and unfortunately the work does not at first follow (it must eventually), thereby bringing his downward influence to bear on his brethren of the same degree. Thus a process of filtration is continually going on, swelling the lower ranks enormously, and leaving the higher ones clear and free, with every prospect of a brilliant future. And then—well, for the peace of mind of the many—"When things get to the worst, they generally mend."

CELLULOID OR CELLONITE?

A suit that the Celluloid Manufacturing Company, of New York and Newark, began a year ago against the Cellonite Manufacturing Company, Wilmington, for infringement of copyright, has been decided by Justice Bradley, of the United States Circuit Court of New Jersey, in favour of the plaintiffs. What makes the suit remarkable is that it has caused the respective publishers of Webster's and Worcester's dictionaries, and of Chamber's "Encyclopædia," to remove the word "celluloid" from the class of words that were heretofore considered public property. The Wilmington Company makes a substance that is similar to celluloid, and have put it on the market under the somewhat similar name of cellonite. The New York and Newark concern at once brought suit to restrain the rival firm from using the word, asserting that the word "celluloid" was a noun of its own creation; that it had copyrighted the word as a trade mark, and that the use of a word in any way similar was an infringement of this copyright. The Wilmington Company offered the dictionaries as evidence that the word was public property. Lawyer Cox, for the plaintiffs, set up the claim that the dictioners had no right to include the word in their publications, and that such unlawful publication could not affect the copyright rights of the plaintiff. He meantime laid the matter before the publishers of the dictionaries, and the latter promptly revised their latest editions. They published the word in its alphabetical place, but with an explanation that it was a private trade mark. Lawyer Cox and the publishers are now trying to introduce a substitute word that may be used by anybody without affecting the copyright, and that will enable the dictionary publishers to continue to print a description of what the substance called celluloid in trade is. Justice Bradley's decision gives the plaintiff exclusive use of the word "celluloid" as a trade mark, and also of its corporate name, and grants a perpetual injunction against the use by anybody of any name in any manner resembling celluloid. A suit is now pending against a prominent retail business house in New York for selling cellonite for celluloid, and also for permitting customers to leave the shop under the impression that cellonite was celluloid. The Celluloid Company assert that this also is an infringement of their copyright.—*Invention.*

To Wash Negatives Quickly.—Place the negative under the tap, and turn the water on so that it will fall with considerable force. Hold the plate diagonally, and turn it round occasionally. While the water is falling on it, go over the surface with a camel-hair brush or a soft sponge, always moving from centre outwards to margin. In a few minutes the hypo will be eliminated.—*Photographic Scraps.*

FLASH POWDER EXPLOSIONS.*

BY CHARLES L. MITCHELL, M.D., PHILADELPHIA PA.

Explosive compounds are defined to be certain bodies which possess the property, when heated or set on fire, or from some other cause, of being converted from their solid or liquid state into gases in an almost immeasurably short space of time, such gases during their chemical conversion liberating heat, and in consequence highly expanding, and through this expansion exerting a great pressure on their surroundings. This conversion is accompanied by a detonation, which in its proper sense is called an explosion. Explosive compounds are divided into two classes. In the first class, designated as "detonators" or "shattering compounds," of which nitroglycerine is an example, the explosion is effected in an immeasurably short space of time, and all parts of the substance decompose simultaneously, thus making the initial pressure of evolved gases the maximum one, and producing the most powerful impression upon closely adjacent bodies. The second class, of which gunpowder and blasting powder are illustrations, are called "disintegrating compounds." The explosion of these proceeds progressively by combustion, and their gases gradually accumulate until the resistance to them gives way.

Of all the salts formed by pieric acid, the picrate of magnesium is probably one of the most dangerous, and, no doubt, caused the last explosion of the series mentioned. It is a well-known fact that chemical combination and decomposition will take place when two different substances are simply mechanically mixed together, and allowed to remain undisturbed for a period of time. Considering these facts, there is no doubt that, if pieric acid and magnesium were placed in intimate contact with each other, as would occur when used as component parts of this flash powder, and then allowed to remain undisturbed for some time, chemical combination would ensue, with the formation of picrate of magnesium. Another fact in connection with this is that powdered magnesium is quite hygroscopic, and has a tendency to cake together in loose masses, or adhere to the sides of a bottle, if exposed to a moist atmosphere. Pieric acid, when powdered, is also rather sticky in character, and it can be readily seen how, if these two substances existed together in a mixture, they would be attracted to one another; then, given the elements of time, moisture, and perhaps some slight warmth, and chemical combination would inevitably occur. That this is not pure theory, but fact, can be substantiated by a fact lately mentioned to the writer by Professor Henry Leffman, of this city, in a personal conversation. He stated that some time previously, while microscopically examining a sample of this "yellow" flash powder, he was surprised to notice an entire absence of metallic magnesium the yellow crystals of pieric acid being alone prominent. On dropping the powder into water, however, an abundant sediment of metallic magnesium was deposited, showing its presence; and a closer examination of the powder showed that particles of magnesium were completely enveloped in a yellow coating of pieric acid. Of course these circumstances afforded a most fruitful opportunity for the conversion of the two substances into the explosive picrate of magnesium, and there is no doubt whatever in the mind of the writer that such combination actually took place.

The presence of this dangerous chemical, probably in considerable quantity, was undoubtedly the cause of the last accident at the laboratory of Wiley and Wallace. It was testified at the coroner's inquest that the victims of the accident were engaged at the time it occurred in emptying some of this "yellow" flash powder into a drain, for the purpose of getting rid of it. They had just returned from court, where Mr. Wiley was defendant in a suit for damages brought by the relatives of the boy, John D. Cruice, and his assistants were witnesses, and no doubt impressed by the evidence of the dangerous character of this powder, as brought out during the trial, determined to remove it out of harm's way as soon as possible. There were some seven or eight pounds of this powder, contained in a large bottle, still remaining in their cellar, which had been made some eighteen months previously, and had remained undisturbed all that time. It is not known to a certainty what was the immediate cause of the explosion. Neither fire nor chemicals were known to have been present. Water had been thrown upon some of it: but experiments subsequently made proved that the addition of water to the compound would not generate sufficient heat to ignite it. The most reasonable explanation, therefore, and probably the only one that can be offered, is that the pieric acid and magnesium had, through long standing, become converted into their resulting salt, and that by some accidental jar, or perhaps in shaking or knocking the bottle to loosen its contents, a portion of the picrate was detonated, causing the detonation of the entire mass, and the consequent terrific explosion. That it was a detonation, and not merely a sudden ignition of the mass, is proved by the fact that the bodies of those killed were not in the least burned or charred, but of course greatly mangled from the force of the explosion. Mr. Wiley's body in particular was found only after some search, and then it was discovered tightly wedged in an empty barrel, dismembered and horribly mangled. In the two previous accidents the victims were simply burned through the sudden ignition and partial explosion of the compound, and their bodies accordingly were marked by great eschars where the flames had reached them; but in the last accident a perfect detonation occurred. This was due probably to the fact that thorough chemical combination of the pieric acid had occurred through length of time. The other accidents occurred during the mixing of the fresh powder, and the injury caused was more due to an intense combustion of the magnesium and chlorate, an explosion of the second class only taking place.

It is evident from these fatal accidents that this particular compound, the "yellow" flash powder of Buchanan, Bromley, and Co., was a substance possessing properties even more dangerous than dynamite, and one that was alike unsafe to make, to use, or to keep. To sell such an article, therefore, for ignorant and unskilled persons to use, or to induce anyone to attempt its manufacture, places a terrible responsibility upon those who knowingly undertook such a risk. The testimony at the coroner's inquest upon the first victim revealed fully the dangerous character of this compound, and if its vendors had possessed but an ordinary regard for human life and safety, they would have promptly withdrawn it from the market. A plea of ignorance is, therefore, useless, and they stand convicted before the bar of public opinion of causing, through cupidity and reckless defiance and disregard of public safety, the death of five human beings, with its attendant train of widowed

* Concluded from page 192.

wives and orphaned children. Not many men would consider this a satisfactory exchange for a few paltry dollars.

The death of Mr. Wiley and his associates, though greatly to be deplored, was largely the result of their own imprudence, and sadly illustrates the fact that men will, through familiarity and frequent handling of dangerous substances, often become almost insensible to the risks of their occupation, and take chances that they would probably counsel others to avoid.

As before mentioned, a curious fact is, that at the time this accident occurred, the firm of Wiley and Wallace were engaged as defendants in Court of Common Pleas, No. 2, in a suit for damages brought by the relatives of the boy John D. Cruice. The case of Cruice v. Wiley et al, will long be a "cause celebre" in judicial records, not so much from the legal features attending its trial, although the case was somewhat unique, but from the tragic features which brought it to such a sudden termination. It is almost unprecedented in the annals of medical jurisprudence, and a very extraordinary fact, that the three individuals who had testified in open court that this flash powder compound was not dangerous and not explosive, should, within a few hours after so testifying, and within a short time after leaving the court-room, be hurled into eternity by the explosion of the very mixture they had endeavoured to prove harmless. As an expert witness for the prosecution, it became necessary for the writer to express a decided and positive opinion upon the dangerous nature of this flash-powder mixture, and during cross-examination the following quotation from Eissler's work on "The Modern High Explosives," was cited, more particularly in reference to such combinations with potassium chlorate :

"In mixing these compounds great danger is attendant, and too much circumspection cannot be used. They explode instantly upon any violent stroke, very often by friction alone ; sometimes spontaneously, as when in a state of rest, and no known cause for their combustion can be ascertained. Many are deluded as to its safety by so-called experiments with freshly-made powder. Manufacturers of the compound may attempt to show its safety by hammering it and cutting, and similar tests ; but let the powder be exposed to the natural atmospheric action, attract some moisture, then get dry, and the least friction or blow will cause an explosion."

Viewed in the light of the subsequent tragedy, these words seem almost prophetic ; yet little did the writer think, at the time when he cited them as evidence, that so soon and so impressively would their truth be demonstrated. Verily, "truth is often stranger than fiction."

It seems hardly necessary now, in view of all that has been cited, to raise a note of warning in regard to the use of these flash-powders, but the statement has already been made that, whilst this particular compound was unsafe, other compounds are harmless. The writer wishes to state emphatically, therefore, that in his opinion *all forms of flash-powders are dangerous*, the difference between them being only in the degree of danger involved. As had been said, they are composed of substances prone to rapid decomposition when in contact with each other ; they are liable to form new compounds, often possessing dangerous and unknown properties. Their combustion is attended with an intense amount of heat, involving risk from severe burns, and they are liable to spontaneous explosion or ignition. This danger is greatly augmented when they are made or kept in mass, and the probable reason why a greater number of fatal accidents have not occurred is because the powders have been mostly made in comparatively small quantities and put up in separate packages, each containing but a few grains of the mixture. A simple mixture of magnesium and potassium chlorate, which has been claimed to be harmless, has been known to explode under percussion, and there is probably no compound of this character which does not possess some elements of danger.

The use of these powders will and should be entirely abandoned, for there are now equally satisfactory and much more safe methods of producing the same result. The different forms of magnesium lamps now on the market, in which the powdered metallic magnesium is thrown into the flame of an alcohol lamp, gives a form of illumination which is quite as efficient photographically, and, what is equally to the purpose, it is perfectly safe ; it has been claimed by some that the combustion of the magnesium, when used with this lamp, was not as rapid as when the flash powder was employed, and in consequence certain instantaneous effects could not be obtained. In the writer's opinion, it would be much better, then, to abandon this class of work entirely, rather than run the risk attending the employment of such dangerous compounds ; moreover, he considers that these objections are mostly imaginary. In Charles Lamb's "History of Roast Pig," it is related that the inhabitants of the country deemed it necessary at first to burn down a house in order to roast a pig. In course of time they discovered, however, that much simpler and less dangerous methods would answer equally as well. It is hoped, therefore, that the time will soon arrive when the photographic public will discover that magnesium can be employed for purposes of illumination without using compounds which are akin to gunpowder and dynamite in their dangerous properties.

THE FIRST OPTICAL LANTERN.

Kircher knew the use of projection lenses for the optical lantern, because, in his older book, he pictured such lenses in the plate representing the apparatus in which the solar rays were used for the illumination. Yet in his later work, printed at Amsterdam, he pictures his magic lantern without projection lenses in front ; hence, last week we hazarded the guess that perhaps he left such lenses out of the diagram on purpose, especially as there is evidence that over some of his discoveries he had a somewhat secretive disposition. However, this supposition is rather hard upon Kircher, for no first-rate man of science or man of fine feeling would give, under the guise of publication, a method which would not work to the best advantage so far as his knowledge went. More probably the true explanation of the matter is, that Kircher's projection lenses were not of suitable focal length for the new conditions under which he worked with the whole apparatus in a small room, so he then threw shadows of lantern pictures upon the wall by means of an optical system entirely behind them, as represented in these pages last week ; if so, the means he used were not unlike the optical system of the lantern of the London policeman. Kircher's pictures had never before been published in this country, nor had Kircher's detailed description of his magic lanterns been previously circulated in the English language.

Patent Intelligence.

Specifications Published.

2,983.—*February 20th*, 1889. "An Improved Lantern." Tom Bell Burns, Camelford, Cornwall, Ironmonger and Manufacturer.

This improved lantern can be made of any shape and fitted with glass, mica, or horn panes, or glass globes, or any other contrivance for allowing the light to pass through; the upper part of the lantern having an opening for inserting a kettle, can, bottle, or any other receptacle for holding fluids or food, and which is heated by means of a candle, lamp, or other heating apparatus. The can, bottle, kettle, or other receptacle can be carried inside the lantern, if required, for the purpose of keeping the fluid or food warm. The opening in the upper part of the lantern is fitted with a door either hinged or sliding, or other suitable contrivance to prevent the wind from blowing out the lamp or candle.

3,279.—*February 23rd*, 1889. "Flashing or Continuous Lights." Frederic William Hart, 8 and 9, Kingsland Green, London, N.E., Manufacturer of Scientific Instruments.

I would here premise that in Patent No. 356, January 9th, 1888, there is described by me in reference to fig. 3, a chambered plug into which falls the magnesium or other inflammable powder from the hopper above, and on turning the plug half-way round, the contents are discharged into a container below; one, two, or more charges could be introduced, according to the volume of light required, the volume and power of the air blast being regulated as set forth by figs. 4 and 5 of the said Patent. Now in the apparatus about to be described, instead of the chambered plug discharging the powder into a container for holding one or more measured charges, I discharge the powder direct from a plug, tube, or other container, surrounded by a barrel or sleeve, to which is attached a hopper or reservoir of the powder communicating with the chambered plug, tube, or other coutainer, or the two fittings may work together over a port or ports, after the manner of the slide valve of a cylinder, so that alternate flashes of light can be given like the discharge from the exhaust tube of an engine, or the hopper can be allowed to remain over one port, and thus give forth a continuous stream of inflammable powder through the aid of air from a fan, bellows, or gas bottle under a regulated pressure. In the case of circular plugs or tubes, instead of the plug or tube turning, the barrel or sleeve with a covered hopper may turn on the plug or tube; the hopper or sleeve is fitted with means to ascertain when the reservoir of material is becoming exhausted. In cases where india-rubber injection balls or bottles are used for compressing air for the discharge of the inflammable matter, the valves of the Patent No. 356, 1888, are used for the purpose therein set forth. For igniting the inflammable matter the pairs of flames are arranged in line thus = = = =, one, two, or more, with intervals so that there is free access of air or oxygen in all directions. When gas is employed the burners are disposed on an adjustable frame also movable on a joint for fixing, so that the light can be directed at any angle from the horizontal to the vertical position, the hopper and container for the inflammable material travelling therewith, so that the discharge tube remains always in line with the igniting burners, so as to produce at pleasure innumerable combinations for dot and dash signals.

In combination with a flashing lamp or lamps for photographic, scenic, signal and other purposes, I employ portable reservoirs of inflammable gas for igniting purposes, and where numbers of separate flashes are required simultaneously, also separate chambers of air or oxygen gas, each under regulated pressure adjusted to the number of lamps and resistance to be overcome.

3,465.—*February 26th*, 1889. "Reproducing Pictures and Designs." Henri Jules Le Boulch, Versailles, France.

By my invention a simple sheet of paper is used in place of stones, or copper, or other plates ordinarily used for the reproduction and multiplication of designs of different sorts, such stones or plates only being required to obtain, in the first instance, the design upon the simple sheet of paper.

I take a sheet of transparent paper or other sufficiently transparent material, and I print upon it from the original stone or plate containing the design, and I retain this printed sheet until copies are required, when I transfer the design upon it to the surface of a stone or other suitable support. For printed or lithographed composition or designs, I make the print upon paper coated with a gelatinous layer, and I then pass it through a bath of solution of bichromate of potash, or other suitable bichromate having the property of rendering gelatine insoluble; and I dry the sheet, expose it to light, then soak it in water until the parts forming the original design completely disappear, then dry it and treat it as a photographic negative. Or, instead of the process just described, the design may be put upon a sheet of paper coated with bichromated gelatine, then exposed to light, developed in water, dried, and then treated as a photographic negative. The gelatinised paper may be replaced by any other kind of sensitised paper capable of giving a negative in the same way.

Or the design may be printed upon a sheet of paper with gelatinous or mucilaginous ink, the sheet being then placed face downward upon a surface of stone or zinc well covered with black ink, which adheres to all the sheet except the gelatinous or mucilaginous design, and passed through a press, the print being then dried and developed in water, the gelatinous or mucilaginous design being washed away, and a negative being thus obtained from which proofs can be produced.

By writing upon ordinary paper with ink of the same kind, and treating the sheet in the way just described, a *facsimile* negative is obtained, from which proofs can be obtained in the same way.

Or a negative may be obtained by writing directly upon the paper or other material with gelatinous or mucilaginous ink slightly acidulated, treating the surface with greasy matter, then washing and inking the surface, and printing from it.

Or a sheet of glass or paper may be coated with white varnish, the print or sheet carrying the design being laid in contact with the varnish, and the other side of the paper support being oiled; the whole is then soaked in water, and a positive is obtained from which a negative may be made in the manner already described.

What I claim is:—

The methods of reproducing pictures and other designs substantially as described.

4,169.—*March 9th*, 1889. "The Manufacture of Aluminium." John Leman Eckersley Daniel, 3, Victoria Street, Westminster, Electrical Engineer.

My improved process, which is based on the well-known laboratory experiments of Bunsen and St. Claire Deville, has for its object the manufacture of aluminium on a commercial scale, certain improvements being made in such experiments, as hereinafter described, to enable the manufacture to be successfully carried out.

In this process aluminium is produced by electrolysing the double chloride of aluminium and sodium, and means are provided for maintaining the bath at all times in a uniform state or condition.

The inventor claims:—

1. Maintaining a constant and continuous replenishment or regeneration of the bath with chloride of aluminium as fast as it loses the same while undergoing electrolysis.

2. The construction and use of apparatus, substantially as described and shown by drawings, for the continuous manufacture of aluminium on a commercial scale.

5,067.—*23rd March*, 1889. "Photometric Apparatus." John Methven, of the Gas Light and Coke Company's Works, Nine Elms, Surrey, Associate Member Institute of Civil Engineers.

My invention relates to that class of photometric apparatus which are known as jet photometers, the object of the invention being to render these apparatus more accurate and reliable than heretofore.

It is a well known and accepted fact that jet photometers, as at present constructed, are not to be relied upon to give an

accurate indication of the quality of the gas to be tested, and the reason for this is, that not only the apparatus, but the gas itself, are more or less seriously affected by changes in the condition of the atmosphere, both as regards variations in temperature, and in the barometrical pressure.

It will be evident, then, that to obtain perfect accuracy in indicating the illuminating power of the gas, two conditions are necessary, viz., a constant temperature and a constant barometrical pressure.

Now, my invention consists in the means whereby these two conditions are practically provided for.

In carrying out my invention, I make use of the ordinary jet photometers, whether they are constructed to indicate the quality of the gas used by maintaining a constant height of flame, and observing the pressure required to produce that height of flame; whether they are of a construction to indicate the quality of the gas used by maintaining a constant pressure, and observing the height of the flame produced by such constant pressure; or of any other form or description of jet photometer, where a jet flame is used for the purpose of a photometer.

For the purpose of maintaining an uniform temperature of and within the apparatus, I enclose in a water jacket the whole of the gas way and the tank or vessel containing the water used for indicating the pressure of the gas within the instrument, and which is commonly known as a King's gauge. The water within the jacket I keep at a constant temperature by means of circulating tubes attached to the water jacket, and heated by a jet or jets of gas. These tubes project through the box in which the instruments are generally placed for the protection from draughts, and the heating jets may be brought into contact with them when desired.

A thermometer is inserted in the water jacket and in the gas way of the instrument, so that the temperature can be always ascertained.

In this way, the temperature of the gas in the gas ways, or measuring parts of the apparatus, can always be maintained constant.

A thermometer will also be placed in the box, so that the general temperature in the box may be the same as the water jacket.

Alterations in the barometrical pressure of the atmosphere affect not only the volume of the gas in the measuring chamber of the instrument, but also the combustion of the jet flame.

For instance, with a prevailing high barometer, the volume of gas within the measuring chamber, or, in other words, the volume of gas passing through the instrument, as indicated by the pressure recorded by the "King's gauge," is compressed; consequently, the quantity of combustible material passing through the jet to form the flame is such that a longer flame is required to consume it. The reverse is the action of a prevailing low barometer. The volume of gas passing through the instrument, as indicated by the pressure recorded by the gauge, is expanded; consequently, the quantity of combustible material which forms the flame is less, and the flame is of necessity shorter.

The means which I use to provide for changes in the barometrical pressure consist of a movable scale, by means of which I am enabled to ascertain what should be the height of the flame, according to the barometrical pressure for the time being.

The scale is attached to a frame secured to the top of the instrument just beneath the socket of the jet burner, and which extends upwards in front of and behind the jet flame. The back of the frame is fixed at about two inches from the centre of the flame, and the front portion at any distance being a multiple of the distance the back is from the centre of the flame. On the front portion of the frame is engraved the scale. The centre portion of the front of the frame, which is made of coloured glass, arranged to be adjusted by a screw arrangement, is moved up or down the frame in guides provided for the purpose, so that the top edge of the glass may be brought to the mark on the scale indicating the height of the barometer for the time being.

The height of the flame will be ascertained in the usual way, by sighting the top edge of the movable blue glass, the top of the flame, and the line fixed on the back of the frame. The position of the line on the back of the frame is arrived at when the instrument is rated by comparison with the results of the standard photometer. Having adjusted the height of the flame, the readings of the instrument may be regarded as indicating the correct illuminating power of the gas by observing the pressure necessary to give the adjusted length of flame. When the instruments are designed to indicate the quality of the gas by maintaining a fixed pressure, and observing the height of the flame produced by such constant or fixed pressure, the scale indicating the length of the flame may be marked on the movable blue glass, and which may be adjusted in like manner to the scale indicating the barometer for the time being; the length of flame will thus have the necessary correction for the barometer prevailing.

I may also use, to provide for changes in the barometrical pressure, a scale which I apply outside the ordinary scale on the dial of the instrument, and which supplemental scale may be worked round the dial by means of a screw which projects through the side of the box.

The supplemental scales I use result from observations extending over a long period of time, and, by taking a reading of the barometer, and bringing zero on the scale to the division at which the pointer of the instrument is arrested, the exact quality of the gas in candle power can be read off.

Instead of moving the scale, I may secure it on the dial, with zero point on the scale corresponding to zero on the dial. Then, taking the reading of the barometer, I make the corresponding reading on the scale zero for the time being, and adjust the quantity of float water in the instrument to bring the pointer opposite such division. In this manner I start with the proper correction according to circumstances.

In these last-named means for providing for variations in barometrical pressure, in which the scale is used as a supplemental scale to the dial of the instrument, or is attached to the zero end of the dial, the results obtained are equivalent to those obtained by altering the height of the flame, but in the latter case the correction is made on the pressure indicated by the pointer of the "King's gauge."

5,218. *March 26th*, 1889. "Expansible Opera and like Glasses." Caroline Spilsbury Pocock, 2, The Elms, St. Anns Hill, Wandsworth, Surrey, Gentlewoman.

So far as can be judged by the drawings, this instrument closes in an exceedingly neat manner, and the mounting might possibly be made to suit a miniature binocular camera. The inventress thus describes the arrangement.

According to the usual construction or arrangement of opera glasses, field glasses, and the like, whether used alone or in combination with views, boxes, or cases, the cases have been of circular form telescoping one within the other to close them to reduce their bulk or occupy less space than when drawn out.

Now the object of my invention is to dispense with these cases which telescope within one another, and use a flexible or yielding body which is compressible, such as leather, or waterproof canvas, or other similar material affixed to the frame composing the object glass and field glass ends, said leather or canvas connection being of tapered form, so that when the object glass frame is expanded or drawn away from the field glass end, the article has the appearance of an ordinary leather or canvas bound metal frame.

To the field or large glass end I arrange a hinge joint to each half of the opera glass, and by leaves or strips hinged thereto, and slotted, I can by a pin connected to the frames of the object glasses retain the object glasses at the required distance, or expanded from the field or larger glass end, the end of the slot in the side strips having a kink in which the pin becomes lodged to retain the article in an expanded form.

The object glasses may be carried in a separate frame to that carrying the pins, and by means of a central screw the focussing can be adjusted.

The parts between the object glasses and the field or larger glasses may be provided with springs to push the object glasses into an expanded condition, and the slotted frames which would limit the extent of expansion can also be arranged for retaining the article in a closed state.

5,525. *April 1st*, 1889. "Photographic Hand Cameras." Denis McNamara, 25, South Terrace, Inchicore, Dublin, Engine Fitter.

Its novel features are, first, a dry plate is changed and placed in focal position and the shutter set, by the one movement, thereby preventing the possibility of exposing the same plate twice over through inadvertence or otherwise; secondly, the one button or knob serves all purposes, viz., for changing dry plate, for setting and discharging the shutter. Hence the advantage by which a number of dry plates may be exposed in very rapid succession.

In outward shape it consists of a rectangular box or case, one end of which is recessed to receive the lens. Within said case is a grooved box open at the side next to the lens, its depth a little more than double that of the sensitised plates, of which it is capable of holding twelve or more; each of the latter is inserted in a thin metallic sheath; midway on the inside of the two opposite walls of said box is formed a horizontal groove parallel to the axis of the lens, through which is passed a thin metallic plate or partition dividing it into two compartments, the upper for the unexposed, and the lower for the exposed plates, and on which it is capable of sliding; the ends of said partition are attached to the walls of outer casing, and a slot is cut in the former sufficiently large to allow one plate with its sheath to drop through at a time from top to bottom compartment. Immediately beneath partition and in said bottom compartment is a rod, one end crossing said slot, so as to prevent a plate from dropping through, and is kept in position by a spiral spring; the other end passes through wall of outer case at the end opposite to the lens, and terminates in a joint, to which is attached a lever actuated by a bar placed longitudinally on the outside of camera, one end bearing at right angles against said lever; the other terminates in a knob or button, which is used for setting and discharging the shutter, and also for changing the dry plates. On the bottom of the outer case is a sliding cover through which the grooved box is charged with dry plates. In doing so the plates are placed in their grooves in the lower chamber, the camera being inverted according as grooved box is moved along the partition; each time a plate comes over the said slot it drops through into the upper compartment, the rod being kept back so as to clear the slot by pressing upon the knob during this operation.

The instantaneous shutter is inside the camera. A nozzle or rim is formed at the back of the lens, on which is fitted a cap capable of opening by a hinged joint at the bottom, and actuated by a spindle, one end of which passes through the outer wall of camera, terminating in a cross-piece forming a T with said spindle. At one end of said cross-piece, at right angles to it, and parallel with wall of outer case, is secured or formed a thin flexible arm of spring steel, the end of said arm resting upon a ledge or stud when the shutter is closed; the other end of cross-piece, forming a crank with said spindle, is used for the purpose of opening the cap by means of a hook hinged on to a sleeve, and kept in position by a flat spring. Said sleeve is capable of sliding upon the bar, to which is attached knob or button heretofore mentioned, and is actuated by a spiral spring slipped over said bar, one end bearing against the sleeve, the other against a movable pin for regulating the speed of the shutter. When said bar is pushed forward by the knob the sleeve and hook are carried with it, the spiral spring becomes compressed, the hook coming into contact with cross-piece, and having a wedge-shaped end, loops on to it; when the finger is removed from said knob the latter returns to its original position, being acted upon by the spiral spring in grooved box, the hook retaining its hold upon the cross-piece: the shutter is now set.

To discharge the shutter, the knob is pushed in the opposite direction, thereby bringing a thin flat projecting piece secured to said bar into contact with flexible arm resting upon projecting ledge, which yields by its flexibity, and is pushed off said ledge; the spiral spring now acting on the hook shoots it forward, thereby turning round the cross-piece with it, and opening the cap; when said cross-piece arrives at a certain angle the hook slips off, but the momentum imparted to the cap causes the latter to strike an elastic band or spring which causes it to rebound and lock itself once more on projecting ledge.

To change a plate, the knob is pushed forward, the shutter becomes set as before, the bar bearing against the end of lever draws out the rod in grooved box, and a plate is dropped into bottom compartment; the pressure of the finger is now removed from said knob, and the spiral spring brings back said rod into its original position, but the latter, when returning, comes into contact with the top edge of plate which has just dropped, and pushes it forward, and being in its groove it carries the entire grooved box along the sliding partition until the next plate following up drops a short distance down into slot in partition, and rests on top of rod; said plate becomes jammed in the slot by the pressure of the rod still bearing on top edge of plate in bottom compartment, thereby keeping the plate steady for exposing.

The plates when dropping would be liable to stick after being jammed in the manner described. To overcome this, the partition where it is attached at both ends to camera is made to slide longitudinally through a short distance. A lever is hinged on inside to wall of camera, one end bearing against a stud on partition, the other end against a similar stud on rod; when the latter is drawn out the said lever moves the partition, the grooved box remaining stationary, and liberates the plate which had been jammed in the slot, thereby allowing it to drop freely, said partition being brought back again to position by a spring.

An indicator is attached to camera for the purpose of registering the number of exposed plates. It consists of a flat graduated bar connected to grooved box, and capable of moving in a guide on the inside of camera, with a hole in the latter, forming light-tight communication with said guide, and through which the number of exposed plate can be read from the outside.

5,287.—*March 27th*, 1889. "Focussing Field, Marine, and Opera Glasses." Samuel Joseph Levi, Optician, and Ernest Carre, Clerk, of 40, Furnival Street, Holborn, London.

Our invention relates to an improved focussing motion for field, marine, and opera glasses; and it has for its object to enable the glass to be more quickly and easily adjusted, which is of importance, especially when, as in the case of a horse race, the object viewed is in rapid motion, and its distance from the observer is therefore constantly and quickly varying.

The invention consists in substituting for the ordinary screw motion, a motion worked by a wheel, or preferably a pair of wheels, turning on a transverse axis at right angles to the line of motion of the central sliding spindle, and of such diameter as to be readily worked by the pressure of the thumbs when the instrument is held by both hands, as race glasses are usually held. Each wheel acts on the sliding spindle through a pin or stud projecting laterally from the sliding spindle through a longitudinal slot in its guide tube, the said pin or stud engaging in a radial slot in the inner face of the wheel. Or instead of a slot, each wheel may have a crank pin fixed to its inner face, the said crank pin being connected with the stud on the sliding spindle by a short connecting link. Instead of wheels small levers may be used.

6,353.—*April 13th*, 1889. "Photographic Apparatus for Tourists." Samson Albert Darier-Gide, 4, Rue Bellot, Geneva, Switzerland.

This invention can be adequately explained only by the aid of diagrams.

19,691.—*December 7th*, 1889. "Photographic Cameras." Oscar Freeworth, of Lenkerbad, County Wallis, Switzerland, Gentleman.

The inventor claims:—

1. In photographic cameras the arrangement consisting essentially of a prism and eccentric discs which, when the prism is turned, force the bellows, which are held firmly against the prism by means of springs, away from the prism.

2. In connection with the arrangement described in the above claim, the employment either of plate or film-frames connected with each other, or, in case of sensitive paper, of rollers.

Correspondence.

A PHOTOGRAPHIC SCHOLARSHIP.

Sir,—May I beg you will insert enclosed correspondence in your next issue? The matter appears of sufficient interest to require public discussion, in order to arrive at the best method of disposing of the gift in question.

I may say that my own feeling is to offer the sum as a scholarship, to be competed for by examination amongst the students of the schools of photography at the Polytechnic, South Kensington, &c., and that the earning of such scholarship should carry with it the necessity for a year's residence and study at one of the best schools of photography on the Continent.

I venture to think this method would tend to elevate the art-science, and place it on a level with other special subjects which are already similarly endowed. John Howson.

My dear Sir,—In looking over the programme of the Conference I see amongst the agenda, a proposal to abolish trade medals at exhibitions. Now, though I hold views on this subject opposed to yours, I am quite ready to admit that general feeling is against me; and that being so, it is manifestly for the benefit of photography that my views should be put aside, and trade medals should disappear. Therefore the Britannia Works Company will, in future, abstain from offering any such medals. This I hope will be some little help in clearing the way for a prompt and easy settlement of the question, as my firm is one of the principal offenders. I take this opportunity of recording my earnest conviction that, however ripe the time may be now for such a sweeping change, in the past the giving of trade medals has served a good purpose, by stimulating competition, and bringing to exhibitions good work which would have been absent in many cases without such inducement. I claim, moreover, to have credit given us for a real desire to further the art of photography, as well as our own ends, in what we have done in the past. To prove that we have been and are to a great extent disinterested in our motives, I am pleased to inform you that the Britannia Works Company have generously placed at my disposal the sum of £100 per annum for three years as a scholarship to be used as may best seem adapted to further the interests of either the art or science side of photography, with an expression of preference for the science side. To the Camera Club, as the leading spirit in all forward movements in the art, I desire to transfer this generous gift, and I trust the Conference will see their way to accept it, and that we may conjointly be able to dispose of it in a fitting way.

Brokenhurst, Ilford, March 10th. John Howson.

G. Davison, Esq.

Dear Sir,—The Committee of the Club discussed the subject of your kind offer at their last meeting on Thursday last, and requested me to thank you for your generous proposition. At the same time it was thought that the best way of applying the gift—or, rather, the best course to adopt—would be to place the fund entirely at the disposal of a committee or trustees formed independently of any *one* society, but rather from the Photographic Society of Great Britain and other leading societies conjointly. A representative committee formed in this way would probably be able to suggest a method of applying such a fund to advantage, either by offering inducement for research and experiments in certain directions, or for original work of value in any way bearing on the advancement of the science or art of photography. G. Davison.

Camera Club, March 14th.

To John Howson, Esq.

Photographic Society of Great Britain.—Technical meeting, Tuesday, March 25th, at 8 p.m., at the Gallery, 5a, Pall Mall East.

Sheffield Camera Club.—At a meeting held on March 12th, Mr. H. W. Smith, representative of the Eastman Company, Ltd., gave a lecture on "Enlargements on Bromide Paper." After detailing the most suitable lights and developers, he gave a practical demonstration on the Eastman paper, explaining the process step by step.

Proceedings of Societies.

Camera Club.

On Thursday, March 13th, lantern slides were shown at the Camera Club. Mr. Webber occupied the chair.

The Hon. Sec. handed round some collotype prints on Japanese paper and satin by Mr. W. K. Burton. Some fine Japanese paper, intended for experiment, were distributed to those desiring pieces.

Professor Stebbing exhibited some collotype prints brought from Paris, which had been produced by M. Balagny. Some of these were on rough-surfaced papers. Mr. Stebbing stated that within three-quarters of an hour of giving a negative to M. Balagny, about twenty prints were given to him. He thought that M. Balagny would introduce his method into England, and he saw no reason why the amateur should not have his own machine at a cost of about £4, and make his own collotype reproductions.

A show of lantern slides was then given; altogether, about 200 slides were brought or sent up by Messrs. W. M. Robertson, Lane, Elder, Seyd, Ellis, Laurie, Fitz-Payne, Howlett, and Grimshaw.

The subject on Thursday, March 27th, will be "Platinotype Possibilities," when Mr. W. Willis will read a paper. Meeting at 8 p.m.

London University College Photographic Society.

March 11th.—Dr. R. T. Plimpton in the chair.

Dr. N. Collie, F.R.S.E., read a paper on "The Chemistry of Photographic Developers." The simplest form of development was first noticed, where a ferric salt has been reduced by light to a ferrous salt, when the nearly invisible image can be made visible by washing with ferricyanide of potassium, or treating with a silver or gold salt, which metals are deposited where the iron has been reduced, thus developing the image. The development of the visible image on the photographic plate was then noticed, and it was pointed out that in this case, as only an infinitesimal quantity of haloid salt of silver undergoes change during exposure to light, development has to be carried on in a different way from that already noticed. The alkaline developers—pyrogallic acid, hydroquinone, and others—were next mentioned. These developers are characterised by their great affinity for oxygen, and differ from ferrous sulphate, the reaction of which with nitrate of silver was discussed, in being able to reduce the haloid salts of silver. The actual chemical change which takes place when a plate is developed by any of these substances was shown to be the same. It is a case of reduction of the silver salt by the developer, but, as the developer contains no silver, the only way in which the image can be built up is by the further reduction of the silver salt in the film. The question why silver is deposited on one part of the film and not on another, thus forming the image, is explained by the assumption that electro-chemical decomposition occurs. It was finally pointed out that in all ordinary cases of development a reducing substance was necessary, and usually the greater the reducing power the more powerful the developer; and, as there are numberless substances amongst organic compounds which possess this reducing power in a greater or less degree (phenyl hydrazine was shown as an example), the choice of new developers is, probably, by no means limited.

In the discussion which ensued, Mr. E. S. Worrall criticised eikonogen as being admirably adapted for certain kinds of work, but, to get a good negative, he preferred the yellow image obtained by using the old-fashioned pyro developer.

The next meeting will be held on Tuesday, March 25th, which will be a lantern night, and the last meeting this term.

Derby Photographic Society.

The monthly meeting was held at the Rooms in Derwent Street on Thursday last; Mr. A. B. Hamilton presided.

Mr. Bankart, of Leicester, gave a lecture on "Development," and exhibited a number of his negatives.

London and Provincial Photographic Association.

At the meeting on the 13th inst. Mr. L. Medland occupied the chair.

The evening was devoted to judging lantern slides put in for competition by the members. The slides were all made from three quarter-plate negatives chosen for the purpose, which were passed to each intending competitor in turn. The subjects were:—"Land's End, Seascape," "Old Houses at New Lyn," and "Children Gathering Seaweed." The slides were projected on the screen side by side from two lanterns supplied and manipulated by Mr. T. E. Freshwater, the slide judged to be the best being left on the screen until displaced by one voted to be better.

At the conclusion it was found that Mr. J. B. B. Wellington's slides had taken first place in all three subjects, and also the second place with two of the subjects, Mr. D. W. Atkins taking the other. Mr. Wellington's slides were made from collodio-bromide plates. Mr. D. W. Atkins used gelatine plates. The competition was an exceedingly close one in several cases, and created a great amount of interest among the members.

West London Photographic Society.

A meeting was held 14th March, Mr. E. W. Foxlee in the chair.

Mr. H. Selby gave a paper and demonstration on "Eastman Stripping Films." The lecturer said although condemned to die a natural death, owing to the introduction of celluloid films, yet stripping films, in the hands of careful workers, presented few difficulties, and were undoubtedly superior to glass in the matter of portability, storage, and immunity from damage if dropped. He attributed his early failures to neglect of the instructions issued by the Company. He seldom dealt with more than two films at a time. The great point was not to leave the film more than ten minutes in washing water after development and fixing. After that time he placed them in an acid bath composed of acetic acid 10 minims, water 10 ounces, in which they were left all night. Films so treated always stripped without trouble. It was very essential to have clean glass. He did not use rubber solution, but polished the glass with French chalk, employing a thin collodion made by the Company. His mode of working differed from that recommended by the Company in the following particulars: he did not strip the same evening as he developed; he never used rubber solution; he did not place the film on glass support under water, it being easy to avoid bubbles without so doing; he never used glycerine and alcohol, and did not varnish the gelatine skin.

In the course of the discussion which ensued, Mr. Hazeon said he had developed only five films, given him by a friend. He had used neither skins, collodion, or rubber solution, but he succeeded in stripping all of them without mishap.

Mr. Wilson, in developing Kodak films, used a weak solution of sulphuric acid and water. He sometimes left them several hours under pressure, not allowing them to dry; they then always stripped. He rather liked the operation of collodionising and coating with rubber, and therefore employed both solutions, although sometimes with the rubber there was a tendency of the film to stick locally.

Mr. Stein had found the film negative detach itself from its skin sometimes, and that when collodion had been employed.

Mr. Rickford wished to know why hydroquinone rotted the film. It did not seem to do so in all cases.

Mr. Wilson had found the films melt away in a hydrokinone developer, which, however, contained caustic soda.

Mr. Hodges considered a roll-holder and films far more convenient on tour than plates: the negatives, owing to the absence of halation, were fully equal, if not superior, to those on glass. They also were very suitable for enlarging, the mat surface backing producing a very soft effect. By copying a small transparency in the enlarging camera the film side out, and enlarging on transferotype paper, or a stripping film, enlarged negatives could be readily and cheaply produced.

Mr. Roland Whiting wished to know whether the film would give a good bite to the retouching pencil. The collodion surface seemed to be very glossy.

Mr. Foxlee thought the collodion film a very valuable part of the process, and Mr. Hazeon ought to attribute his success to sheer good luck. The collodion not only protects the stripped film, but holds it together while upon the glass, and to avoid risk it was better to employ a preliminary coating of rubber solution. In very refractory cases he had used *boiling* water with success, which could have done without a rubber substratum. Damp sometimes caused the insoluble chromated emulsion to affect the soluble substratum of gelatine; difficulty in stripping them occurred; the weak acid solution, however, remedied this defect. He did not leave the films under pressure more than ten minutes. It was a mistake to leave them soaking after fixing, because the pyro exercised a tanning action on the soluble gelatine, and if the film were allowed to dry before stripping, the difficulty of stripping would be greater. He had never found the films become detached, and was at a loss to assign a reason.

Mr. Hodges thought it might be due to the presence of grease, or to careless squeegeeing.

The next meeting will be on March 28th, a lantern night, when friends are invited.

Glasgow Photographic Association.

March 6th.—Mr. William Lang, jun., F.C.S., in the chair.

A paper on "The Sizes of Plates" (see page 220), by Mr. J. Craig Annan, was read, and a discussion followed, the general outcome of which was that if an adjustment should be made, it should be done on an international basis.

A picture taken by an automatic photographic apparatus was afterwards shown to the members. It had evidently been taken on a wet plate, but particulars of the apparatus itself had not been given in sufficient detail to explain the *modus operandi*.

Mr. Patrick Falconer followed with a communication—"A Neglected Dry-plate Process," showing results obtained by the method, both transparencies and negatives. The process in question is one put forward by Mr. Hannaford in 1861, where the sensitised collodion plate, after being washed, is coated with a preservative of white of egg to which a certain amount of nitrate of silver has been added, and the albuminate of silver formed dissolved in ammonia. Mr. Falconer has worked the process for twenty-five years. The speed of the plate would appear to be very rapid, Mr. Falconer and the President having made transparencies shown at the meeting on the screen by means of the Association's lantern, when the exposure behind a negative did not amount to more than a second or two in front of an ordinary batswing burner. The image was brought out by means of eikonogen, and afterwards strengthened by means of pyro, citric and glacial acetic acids, and silver.

Several photographic novelties were shown, and an exhibition of transparencies by means of the Association's lantern concluded the evening's programe.

Photographic Society of Ireland.

A meeting was held at the Rooms, Dawson Street, Dublin, on the 14th inst., with Mr. Greenwood Pim in the chair. After election of four new members,

Mr. Louis Meldon read a paper on "Shutters." He said that he would confine himself to observations on instantaneous work, and the lenses most suitable. Having explained the working of the Wilson chronograph, which he used as his timing apparatus, he went on to say that shutters might best be classified relatively to the position they occupy when used with the ordinary form of doublet lens: 1st, on the hood of the lens; 2nd, between the two combinations; 3rd, immediately behind the lens; 4th, immediately in front of the plate. The fourth class he intended at once to dismiss, for, although its position was in many respects the most favourable of all, the advantages were much out-balanced by the inconvenience due to the large size of the apparatus needed. An ideal shutter, he said, was one which, if it were possible, would open to its full aperture suddenly, and without lapse of time, and, having remained open a certain time, would close suddenly

again. Mr. Meldon, having considered most of the instantaneous shutters in general use amongst photographers, proceeded to describe his own, and passed through the lantern some specimens of its work.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A MEETING was held in the Mayor's Parlour, Old Town Hall, on March 12th, Mr. S. S. PARTRIDGE in the chair. Mr. Thos. Scotton was elected a member of the Society.

The silver and bronze medals were presented to the successful competitors in the lantern slide competition—Mr. Porritt and Mr. Joliffe respectively. The competition for silver and bronze medals for enlargements offered by Mr. F. Pierpoint was declared void, in consequence of the number of entries not complying with the conditions. The competition was postponed until the October meeting, when silver and bronze medals will be offered by Mr. Pierpoint for the best enlargement, members to enter not more than three specimens for competition. The medals are offered on condition that not less than three compete for the silver, and five for the silver and bronze medals.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

THE annual dinner was held at Beale's Restaurant, Holloway, on the 15th inst., Mr. J. HUMPHRIES, F.S.A., in the chair.

The usual loyal toasts having been honoured,

Mr. J. W. MARCHANT proposed the toast of the evening, "The North Middlesex Photographic Club and its Officers," which was responded to by the

CHAIRMAN, who briefly sketched the position of the Club, and alluded to the ability and energy displayed by the council and hon. secretary (Mr. G. R. Martin) in the past year, and to the successful manner in which the arrangements in connection with the recent exhibition of photographs and soirée had been carried out by them. The roll of membership had increased, as also had the finances of the Club. The lectures and demonstrations had been well attended.

Mr. BROCAS (Holborn Camera Club) acknowledged the toast of "Kindred Societies."

Mr. G. R. MARTIN (hon. secretary), who replied to the toast of "The Press," said he was glad of the opportunity of stating how much the Club was indebted to the Press in reporting their meetings.

Mr. DAVALL, senr., responding for "The Visitors," referred to the wonderful advances made in photography, particularly in the astronomical direction.

During the evening, a varied series of vocal and instrumental music added to the entertainment.

The *menu* card consisted of an original design by Mr. Saville, photographed and finished by Mr. Beckett, both members of the Club.

THE PHOTO-NEPHOGRAPH.—In the exhibition at the Meteorological Society, was Captain Abney's photo-nephograph, or cloud camera, which Mr. Whipple described as an apparatus not yet fully developed. He said that its object is to obtain simultaneous instantaneous photographs of the same cloud from two or three stations situated at a distance from half a mile and upwards from each other. These simultaneous pictures are then utilised for determining the positions of clouds above the surface of the earth, and so obtaining a knowledge of the upper currents of the air, their direction and motion at heights far above those at which anemometers can be placed, and in places where they may be supposed to be unaffected by the irregularities and eddies formed by excrescences, such as hills and valleys, which modify the contour of the earth's surface. At Kew, two cameras fitted to theodolites are erected on stands half a mile apart, but electrically connected by an underground telegraph wire. Each camera is provided with an adjustable instantaneous shutter, which can be manipulated by an electric current at the will of the directing operator. The *modus operandi* is as follows:—A first points his camera at a selected cloud, and then having instructed the observer at the remote station B, through a telephone, as to the direction in which he should place his instrument, releases both shutters at the same instant of time, so obtaining a pair of pictures in which the stereoscopic effect affords the required data.

Answers to Correspondents.

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

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

M. E.—*Asbestos Wicks.* We have had no experience with asbestos wicks, but imagine that they would not be less liable to clog, for a carbon deposit would be formed at the top, and entail the necessity of occasionally igniting the asbestos to get rid of it. Try the experiment for yourself, either with the loose fibres or a strip of asbestos cloth.

C. N. W.—*Photogravure Details.* Try to attend the practical demonstration to be given at the Camera Club Conference this afternoon, about 5 p.m., at the Society of Arts. You will be admitted on signing the visitors' book.

RETOUCHER.—*The Address of Herr Fritz Luckardt* is Hotel National, Vienna. You will find an account of his studio and special device for glazing the roof in the article, "Fritz Luckardt at Home," at page 460 of our vol. xxv.

R. B. B. (Dennistown).—*Etching of Glass.* There are two methods: the first, producing "satin effects," is done by hydrofluoric acid alone. For a dead-white etching, make a mixture, in a gutta-percha or lead bottle, of very finely powdered fluor-spar with enough strong oil of vitriol to form a thin paste, and allow time for the acid to decompose the calcium fluoride. Write with a quill pen or small brush dipped in the fluoric ink on the glass direct, without either wax or varnish for protection. After a few minutes' contact, wash off and dry with filter-paper. A small proportion of precipitated sulphate of baryta is sometimes added to thicken the ink before use, and give more opacity.

V. R. (Malta).—*Method of Reviving Daguerreotypes.* The best process is by immersion in a very weak solution of cyanide of potassium, watching carefully until the image is just cleared, and then quickly washing under a tap, with final rinse in distilled water. Allow to dry spontaneously in the air.

M. F.—*A Small Studio.* The information you require is given in Mr. H. P. Robinson's little book entitled "The Studio; and what to do in it," published by Messrs. Piper and Carter. A very compact form of studio was described by Dr. John Anthony, at the April, 1870, meeting of the Photographic Society. See the *Journal* of that date. But the details of construction must always be to some extent governed by local circumstances. You might be able to build one for the sum named, but the calculation would be rather close.

H. B.—Your letter received, signed, and passed on to the Kingsland Branch.

M. E. P.—The *Crystal Palace Exhibition* remains open until Saturday, 29th inst. The lantern display is better than ever; two new lenses, of three inches clear aperture, with big lime lights, project the image upon the screen, which is said to be 35 feet in diameter. The amplification is therefore about 140 times. Ask Mr. Brooks to let you see the apparatus.

D. W.—Received the four cabinet vignettes. They are, indeed, excellent, and we will write you respecting them in the course of a few days.

F. S.—*Iris Diaphragm.* The only objection arises from the chance of grit getting into the working parts; but against this you may put down the loss of time in changing the sliding diaphragms, and the possibility of leaving them behind, or of dropping them into long grass or heather in the field.

E. P.—*Fading of Silver Prints.* The liabity to change has been vastly over-rated, for if carefully fixed and thoroughly well washed, finishing off with hot water, the longevity is quite remarkable. We have seen some notable instances lately of good prints not appreciably affected in thirty years.

Several other corespondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1647.—*March* 28, 1890.

CONTENTS.

THE INVISIBLE PHOTOGRAPHIC IMAGE.

THE nature of the invisible photographic image being unknown, the wisest course is to weigh all the different hypotheses at present in existence, and not to try to raise any one of them to the level of a kind of Athanasian Creed which must not be denied without the individual falling under the ban of heresy. Mr. Bothamley did not do this in his paper read before the Camera Club Conference, still there may be no harm in pointing out some of the arguments in favour of the dynamical hypothesis of the nature of the invisible image.

The chemical hypothesis is that the molecule of bromide of silver is decomposed by the action of light. The dynamical hypothesis is that it perhaps is not decomposed, but that the interatomic vibrations of the molecule are modified, and that the affinity of the bromine for the silver is thereby somewhat weakened by the action of light, so that the developer acts more easily thereupon, and decomposes the modified molecule more quickly than if it had not been acted upon by light.

The initial effect of the light is undoubtedly of this kind, because an instantaneous action is unknown to science; every decomposition requires time, for all nature works as if upon springs. A bottle of mixed hydrogen and oxygen gases, for instance, cannot be exploded all at once; experiment has proved that a portion of the mixed gases remains unburnt. On these principles the dynamical hypothesis is certainly to some extent true, even if the chemical hypothesis should be the true one in relation to the final phenomenon of an invisible image on the plate when the latter is ready for development.

In the abstract of the paper given last Friday by Mr. Bothamley, the main argument against the dynamic hypothesis was, that if light merely modified the motions of the constituents of the molecule, in the course of months or years the motions would resume their original character, and the fact would be indicated by the dying out of the invisible image on the plate, so that no picture could be brought out by development.

For the sake of simplicity in illustration, two atoms only may be assumed to be in a state of some kind of vibration in relation to each other, and to place a definite picture in the mind's eye, we will compare these two atoms with the sun and the earth, calling the sun an atom of silver, and the earth an atom of bromine.

Leverrier first proved that the orbit of the earth varies with time, in consequence of perturbations set up by the planets. At the present time the path of the earth round the sun is nearly circular, and at midwinter the earth is nearly ninety-one millions of miles from the sun; but when the orbit was at its greatest eccentricity the earth was nearly ninety-nine millions of miles from the sun at midwinter. One period of great eccentricity began 240,000 and ended 80,000 years ago, and is one which is quoted by Dr. Croll and others in support of the astronomical theory of glacial epochs, a theory more generally accepted by scientific men than any other. In the thousands of consecutive years during which the earth is at midwinter more than, say, four millions of miles from the sun than at present, it neither breaks away from the sun, which would correspond to the decomposition of our imaginary molecule, nor does it come back in a few months or years, or hundreds of years, to its present path round the sun.

The objection may be raised that in the matters of weight and speed it is not fair to compare the infinitely great with the infinitely small, but the response is that little is known about atoms; nobody has ever seen one, nor is much known about the immense forces which control their motions. Professor Tyndall often amused Royal Institution observers by bursting bombshells by means of the molecular force exercised by water when in the act of freezing.

The argument was put forth at last week's Conference that there is no doubt as to the decomposition of the molecule, because of the smell emitted by large

numbers of bromide plates when exposed to strong daylight at works where they have been spoilt in the course of manufacture. Nobody denies, however, that light, when it acts long enough, may set up chemical decomposition, though this is not so clear in the case of absolutely pure iodide of silver when not in contact with any other chemical substance, so far as man can surround it with such conditions.

Mr. Carey Lea, who accepted the dynamic hypothesis soon after it was first published by its two originators, has changed his opinion at least three times as to the nature of the invisible image, and there would be nothing surprising if he changed it again next week. This is to his credit; it proves him to be a philosopher who does not dogmatise, but changes his opinions from time to time as newly revealed facts come under his notice.

One of the functions of trained scientific men is that of experimentally investigating such problems as these, and much chemical and mathematical investigation will have to be brought to bear upon the particular question now under notice. The chemist may hereafter tell us what is given off by bromide plates when exposed to sunlight, and the mathematician may bring evidence to bear as to the possible duration of modified interatomic motions, assuming such to exist. Professor Dewar took up safe ground when he stated that it is an exceedingly difficult task to determine what takes place when light first strikes a photographic film. Professor Meldola is to lecture on this subject a few weeks hence at the Royal Institution, and what he has to say thereupon cannot fail to be of interest.

THE CAMERA CLUB CONFERENCE.

The First Day's Proceedings.

A report of the first day's proceedings of the Camera Club Conference was published in these pages last week, and to-day we add a brief portion of Mr. Rossi's paper read thereat, as follows :—

Mr. Rossi on "Photography and Drawing."

Mr. Rossi, in the course of a paper on the above subject, said :—

The marvellous perfection to which photography has risen, and the facilities that she offers us, have so minimised the long and tedious years of an art education, that a youth born an artist can now accomplish, in as many months, that which would have taken him so many years to learn before photography.

The three great components that constitute an artist are design, drawing, colouring. By design we understand the idea, the scheme, the conception that an artist wishes to express. This is a creative faculty, and, like colour, cannot be taught; if it is to some extent acquired by tuition, it will be destitute of individuality and void of originality. Drawing is the necessary foundation of painting, without which it is impossible to obtain the images of things or their action, their just proportions, expressions, or animation.

This knowledge, though infinitely easier to some than to others, can be sooner or later acquired, and by practice can be perfected. Colouring, as we said before, is an instinct born with us. Every man has a genius—the evil, the dormant, the sluggish, and the bright genius that inspires in our works that mysterious breath of the spirit that makes us see lovely images. Unfortunately for many, their mind has been unable to carry them beyond the borders of the boundless area of mediocrity to get a glimpse of the glorious fields of immortality. Nevertheless, their academical education has not been lost, for it has given them experience, which has convinced them that a true artist now is not made at an academy, or in any of the numberless schools where young people flock by the hundred to the destruction of art, but by going to nature ; and if such youths who can from nature's inexhaustible book get inspiration and learning, devoted themselves to art, it would be a blessing for all connected with it. Michael Angelo called with Vasari one day on Titian, at the Belvidere at Rome, to see a picture of a naked figure of Danea. Many of the guests began to praise the work highly, as do people when the artist is present, and Michael Angelo, when all had left, declared that the manner and colouring of Titian pleased him greatly, but that it was a pity that the Venetian did not study drawing more, for if, he added, the artist had been as aided by art and knowledge of design as he had by nature, he would have produced works that none would surpass.

I would ask you, if an artist of Titian's gigantic powers lived now, and had produced a picture of a naked figure, would he have incurred the criticism that his great brother artist passed upon him? I think not; for conscious, as great men generally are, of the weak point in their works, he would be sure to use all the legitimate means in his power to secure a correct outline before applying to it his fascinating powers of painting. I can therefore well imagine a nineteenth century Titian taking a good photograph of *that* he has conceived with his imagination, and tracing it on his canvas to his size before painting from his model, and thus he would be sure to produce that which the modern Michael Angelo would admire, not only in the manner and colouring, but also in the drawing. It is indisputable that photography has destroyed all conventionality and mannerism in art, and has shown us the correct way of drawing, by placing before our eyes the true forms of lovely things and of all things.

Mr. Rossi concluded his paper by expressing his firm belief that the only teachable part of art, which is drawing, is sinking with the rising of photography, and, in his humble belief, the days are not far off when a youth, born with artistic instincts, in a few months of mechanical instruction can be his own teacher, and photography will be his academy.

The Second Day's Proceedings.

The second and last day's proceedings of the Conference began last Friday morning in the hall of the Society of Arts, London, under the presidency of Capt. W. de W. Abney.

Discussion on Regulations for Photographic Exhibitions.

Mr. George Davison read a variety of papers and letters upon photographic exhibitions, in the course of which he stated that the following opinions had been expressed by various societies and exhibitors at a representative conference in 1888 :—

1. *Length of Notice.*—Unanimous that long notice should be given.

2. *Previous Announcement of Judges.*—The meeting at the Camera Club in 1888 was unanimous in favour of early announcement of judges' names, and there was a large preponderance of replies from influential exhibitors consulted in which the same view was definitely taken.

3. *As to Classification.*—Opinions divided, but considerably in favour of classification by "subject."

4. *Awards or no Awards.*—A large majority of opinion that awards are generally desirable at photographic exhibitions.

5. *As to Frequent Exhibition of Prize Pictures.*—The 1888 meeting decided by a large majority in favour of a champion class; but there was a very large preponderance of opinions from leading exhibitors that medalled pictures should only be restricted by a time limit varying from one to three years from date of first exhibition.

6. *As to the Amount of Work to be Performed by the Exhibitor.*—All the written opinions urged the necessity of selection, exposure, development, and printing being the work of a competitor, a fair sprinkling making an exception as regards mounting. The meeting added a unanimous resolution that where competitive exhibits were the work of more than one operator, the same should be notified in the catalogue.

7. *Judges for Art Section.*—The 1888 meeting preferred, by a majority, that the judges in the Art section should be "photographers, admitted authorities on the artistic side of photography," rather than solely "artists recognised in the artistic world."

8. *Judges for Scientific Classes.*—Unanimous that experts only be adjudicators.

Other points which were unanimously agreed upon were as follows:—

9. All awards should be of equal value.

10. The granting of large numbers of awards, and the acceptance by exhibition authorities of prizes offered for the purposes of advertising, greatly to be deprecated.

11. That some limit be imposed upon the number of photographs to be accepted from one exhibitor.

He added that opinions on some of these points had since been modified, and that the discussion thereof would be useful.

As recommendations the Club put forward the following suggestions:—(*a*) That the power of rejection of inferior entries should be rigidly exercised; (*b*) that with reference to Rule 6 greater effort should be made to encourage the exhibition of photographs, specimens, and other things illustrating the application of photography to various sciences and industries; (*c*) that retouching be declared; (*d*) that proper and full provision be made for re-packing pictures for transit; (*e*) that a small charge for wall space—minimum 2s. 6d. for 10 square feet—be made; (*f*) that the number of photographs sent in to any one section by each exhibitor be limited; (*g*) that each photograph in the Art section shall be separately framed.

Any distinction between amateur and professional in photographic exhibitions is considered absolutely unnecessary, and greatly to be deprecated.

The Club looks forward to a time when it may be possible to dispense with awards entirely, and would approve of an exhibition in which no medals were offered, but in which greater stringency was exercised by the committee of selection, so that the honour of being hung would constitute an award.

Mr. Mansfield, president of the Dublin Photographic Society, objected to the formation of a champion class at exhibitions.

Mr. Davison found the objection to a champion class to be general. He added that Mr. Robinson had written, stating the best exhibition system to be that of the Photographic Society of Great Britain, that champion classes are objectionable, and that he thought that the disqualification of photographs which have previously taken one prize would amount to giving place to second-rate pictures. He objected to a division between amateurs and professionals, but thought that if one were made, it should be absolute. He likewise thought that excessive retouching should be discouraged. Mr. F. Hollyer wrote that the champion demon should be knocked out; he had known many champions in his time, and they all drank themselves to death. Mr. Sutcliffe wrote that all prizes should be declined which savoured of trade, and that a total of about ten medals should be given to each five hundred exhibits. Judges' names should be published from the outset, that photographers might know whether to exhibit or not. He was in favour of separating amateur and professional work at exhibitions. Messrs. Cembrano, F. Evans, and others had also written on the subject. The Camera Club found the number of awards to be out of all proportion to the number of photographs exhibited, and that they were seldom withheld. The secretary to the Photographic Society of Great Britain wrote that the council hoped that the step taken by the Club would lead to some general agreement, and hoped that the suggested regulations for exhibitions would be drawn up somewhat on the lines of the annual exhibition of the Photographic Society.

The Rev. F. C. Lambert would like to gather general opinions on several points, and thought that rules and recommendations should be separated. He did not wish the idea of classification to be suppressed for photographs which were not upon attractive subjects, for then the latter would have little chance of being recognised. He thought it to be undesirable that editors should be judges, and that all the work over the photographs on view should be done by the exhibitor or exhibitors. On the principle of "one day's work one day's pay," he hoped that no picture would receive a second award, and that there should be some time limit; for instance, it might be a rule that photographs exhibited should have been taken within the previous twelve months. There might be one champion class once a year, but he should prefer the abolition of champion classes altogether. He thought that in judging, technical excellence should weigh somewhat, but artistic excellence chiefly.

Mr. C. W. Hastings said that it was all very well for the Camera Club to lay down rules, but could provincial societies adhere to them? He suggested that a permanent photographic exhibition committee should be formed in London, that the councils of the Camera Club and Photographic Society should be drawn upon for such committee, and that the presidents of provincial photographic societies should be members thereof; there should also be local provincial exhibitions and sub-committees. No picture should take a second prize, and permanent judges should be appointed. All medals and diplomas should come from the permanent committee. Champion classes had been established to keep out "pot hunters."

Mr. W. D. Welford wished to try to represent the feelings of the provinces in the matter. He agreed with the principles expressed by the Camera Club, but thought that it would not be safe to pass the rules and recommendations as they stood, because they would be thought impracticable, for exhibitions in the provinces ran on different ground to those in London. One of the aims of provincial exhibitions is to educate the public as to the claims of artistic photography; it is also necessary that they should pay, and the rules before them would prevent exhibitions being held. Practical and not ideal rules were required, especially as there are more exhibitions in the provinces than in London. Everything seemed to depend on the judges, and that the exhibitors should have confidence in them. He thought that editors should not be judges, because they might have to express opinions elsewhere on the exhibits; he also thought that technique should not be entirely lost sight of in judging. To abolish all classification was too sweeping a change, and he did not see what

gain there would be to art by making a distinction between the amateur and the professional photographer.

Mr. A. Maskell was opposed to any system of prizes, awards, or judges, and if the Camera Club did not have them, he could not see why it should try to lay down rules on these subjects for others. He objected to advertising prizes. He should like to see an annual *salon* or academy, at which it would be an honour to have pictures hung on its walls, and the judges—that is to say, the hanging committee—should be mainly sought from without. In the arts, much work is done by assistants; and in photography, in which so much of the work is mechanical, he did not think this matter was one which need be inquired into. He hoped that the term "amateur" would soon be disused. At all international exhibitions photography has been placed in the background, and the exhibits put in any out-of-the-way places; and photographic meetings seem to be recognised by an ignoring press as dealing neither with mechanics nor with art.

Sir David Salomons objected to landscapes and portraits being classified under the same heading; he did not see how they could be compared in giving one award. As for those firms who offered trade medals, he never bought goods of them, and he advised his friends to take the same line of action. If judging went only upon artistic merits, technical photography would soon go down hill. Nine out of ten photographers admitted retouching to be necessary in portraiture whenever there was no power to select the subject, and landscapes could often be improved by introducing clouds; so photographs produced on such lines ought not to be disqualified.

Mr. H. Trueman Wood thought the classification of the Photographic Society to be good, and that it had worked well. The rules before them, he thought, should be referred back to the Camera Club Committee, which could then be guided by the light thrown upon them by that discussion.

Mr. Davison then gave his personal views, which were, in reply to Mr. Lambert, that he thought it to be far easier for the judges if there were no classification. As to Sir David Salomon's objection, there was a provision in the rules, for the judges had the power of deciding how many awards should be made. Some workers produced but one or two artistic pictures in a year, and the competition system prevented some of the best work being exhibited. A suggestion had been made that in judging, attention should be "chiefly" instead of entirely given to artistic merit. He thought that the two things—technical and artistic merit—could not be separated. Some of the suggestions of Mr. Hastings deserved consideration. Mr. Welford had argued that classification would interfere with the success of local exhibitions, but he (the speaker) did not see that at all; he agreed with the ideas of Mr. Maskell, and was of Mr. Trueman Wood's opinion that the matter had better be postponed.

Mr. Macey Wright wished to know if all editors were to be excluded from being appointed judges.

The President replied that the rule was meant to apply to the editors of photographic newspapers. As to Mr. Maskell's remarks, if the Photographic Society was not recognised by the scientific press, it was entirely its own fault, for when scientific papers were read before it, some of the members said that they were too abstruse and had better be taken somewhere else.

The report was then referred back to the Camera Club Committee.

Lord Rayleigh on "Photography by the Light of the Electric Spark."

Lord Rayleigh, Secretary to the Royal Society, and Professor of Natural Philosophy at the Royal Institution, said that in response to an invitation from their Hon. Sec., he had attended to describe his experiments upon the above subject. He had had occasion to photograph the drops into which jets of water burst soon after issuing from a nozzle or from a hole in a plate, and the jets under examination varied from $\frac{1}{2}$ inch to $\frac{1}{30}$ inch in diameter. They were in a state of unstable equilibrium, for the tendency of such cylindrical bodies of water is, to separate into drops bearing a tolerably definite relation to the diameter of the particular jet. He then projected upon the screen by means of the lantern a photographic picture of that part of the jet at which it breaks into drops. As the drops are sometimes at the rate of about 100 per second, to photograph them sharply the time of exposure must be limited to a great deal less than $\frac{1}{1000}$ of a second, and in some cases to $\frac{1}{10000}$ of a second. A very great degree of luminous intensity in the images thrown upon the plate is therefore necessary, and he did not think that this could be obtained by means of ordinary photographic appliances. He added that "the spark is taken between brass balls enclosed in a magic lantern. The light issuing from the condenser, still slightly divergent, falls at a distance of sixteen feet upon a large single lens of about ten inches diameter, which plays the part of a field-glass. The photographic lens, a large portrait combination by Dallmeyer, is situated about seven feet behind in the image of the lantern condenser as formed by the field-glass, and is just large enough to include it. The jet to be photographed is placed parallel to the field-lens, and as near as conveniently may be upon the side next the photographic camera. The preliminary focussing of the image upon the ground glass cannot well be effected by the light of the sparks. For this purpose a candle, which may stand in front of the lantern condenser, is substituted." To get the spark, he used the large battery of Leyden jars at the Royal Institution, charged by a powerful Wimshurst's electrical machine. All along, his principal difficulty had been that of getting enough light, for, in these very rapid exposures, the effect of the light upon the eye seems altogether greater than, and out of proportion to, its effect upon the photographic plate. A great deal, however, can be done by varying the development, and by subsequent intensification. Each drop, as it comes off, is connected by a ligament to the main jet; this ligament then breaks, and forms itself into a little drop behind the big one, and, as it travels faster than the larger one, comes into collision with it. He described the effect of weak electrical action upon the sensitive part of these nearly vertical fountains, which is where they break into drops, and how electricity caused a number of the drops to coalesce into one large blob.

Mr. Charlton Wollaston thought that perhaps the experiments revealed the cause of the large size of drops of rain during a thunderstorm, and that electrical influences might have something to do with the formation of waterspouts.

Mr. Trueman Wood had seen the experiments at the Royal Institution; he had also tried to repeat the experiments at home, and he had been struck by the small amount of light available; he had been much struck by the feebleness of the photographic effect, as compared with the brightness of the image on the screen. A great amount of concentrated light was necessary to get any image at all. Could any estimate be made of the length of time of duration of the spark?

Another speaker asked if Lord Rayleigh had photographed drops when falling on a surface and breaking into splashes.

Mr. Elder thought that the brightness of the spark increased with the amount of self-induction in the circuit.

Sir David Salomons said that the spider, in spinning its web, exuded a viscous substance which aggregated into beads; he thought that perhaps by the means described such facts could be photographed, and additional information obtained about insects and animals.

Lord Rayleigh replied that no doubt electrical influence had to do with the big drops in which rain fell during thunderstorms. If, instead of placing a weakly-electrified body near the jet, a strongly-electrified one were used, the dispersion of the jet was increased instead of diminished, for the drops, being similarly electrified, then repelled each other, and did not collide. When moderately electrified, they united instead of rebounded, and it seemed as if some kind of a disruptive discharge took place. It is not clear to which of these causes the big drops of rain during thunderstorms are due. He had not yet attempted the photographing of drops splashing upon a plate, for to make the exposure at the precise moment when a drop fell on a plate was a difficult matter. He doubted if increased induction would give a brighter light, but had not tried it. He had not exact measures of the periods of the electrical sparks he used. An American professor had done some work in estimating the period of electrical sparks, and

had proved that very small sparks had periods going down to one-millionth of a second, or less.

The President said that photographing by the electric spark had been done in the old Daguerreotype days, and that he had repeated the experiment at the Royal Institution, but he used a reflector instead of a condenser to concentrate the light from the flash. He had also tried to ascertain the duration of the light, and made out that it was certainly less than $\frac{1}{100000}$ part of a second. The late Professor Guthrie and himself had begun the investigation of splashes; but the death of the former broke off the experiments.

Captain Abney on "A Photographic Untruth."

Mr. H. Trueman Wood then took the chair, while the President read a paper on the above subject.

Captain Abney said that the particular photographic untruth with which he had to deal was the untruth in form which a photograph gives when judged by the effect of light and shade. He had placed a white cylinder in a perfectly dark room, then had illuminated it from one direction only, and had found that the effect varied, according to the angle at which the light fell. Such illumination made the photograph of a man's face longer from front to back than it should be, and photographers, by a kind of instinct, seemed to try to get rid of this by extra illumination of the side. He had used exact measurements in his experiments, and had come to the conclusion that photographic gradation is never right. Photographers had long ago found out that they could not use the same mode of lighting as the painter.

Mr. C. H. Bothamley on "The Latent Image."

Mr. C. H. Bothamley gave an abstract of his paper on the above subject. He said that the physical theory of the latent image is, that when light falls on a sensitive plate, the molecules on which it acts are thrown into a state of unstable equilibrium, so as to be afterwards more readily affected by a reducing agent. If so, the disappearance of the latent image ought to be spontaneous, and he took it that the disappearance of the latent image is not spontaneous. Carey Lea, once one of the foremost supporters of the physical theory, had recently thrown over the last vestige of evidence in its favour by showing that silver iodide has the power of absorbing a considerable quantity of free iodine. After the exposure of the plate to light, the iodine is re-absorbed, and the plate comes back to its normal state. The perfectly pure haloids are not changed by light, but in the presence of moisture they are decomposed under luminous action. The dark solid substance formed under such conditions is probably not metallic silver, because it is difficultly attacked by nitric acid. He thought that the chlorine and the bromine liberated by light united with the gelatine, for he had failed to obtain evidence of the liberation of bromine in the free state upon the exposure of the plate to light. Exposed plates had been kept for months in some cases, and in some other instances for two or three years before development; if, then, the change set up by light had been merely throwing molecules into a state of unstable equilibrium, it was highly probable that in all that time the plate would have gone back to its original condition. He had repeated the experiments of others, and had found that bromine destroyed the latent image, but that it was extremely doubtful if even the strongest nitric acid would do so. Mr. Carey Lea had proved that marking a plate with a weak solution of hypophosphite of soda, also of certain other salts, would produce a latent image which could be made visible by development. He (Mr. Bothamley) had found that a plate so treated acted in every way the same under chemical reagents as a normally exposed plate. Pressure, or rather shearing stress, will produce a latent image, which is destroyed by bromine and certain other reagents; evidently stress produced the same substance in the film as did light. He thought Hodgkinson's and Meldola's views as to the chemical constitution of this substance to be extremely improbable; he thought that no oxychloride was present, but some reduction compound of silver. The investigations of Mr. Spring, of Liege, might have some bearing upon the problem of the effect of shearing stress upon a photographic plate, for Mr. Spring had found that substances which expand when they combine, form a compound which is decomposed under pressure.

Mr. John Spiller said that free bromine is given out when dry plates are exposed to light. Last summer he was near a stack of condensed plates exposed to sunshine, and the smell of bromine was nearly strong enough to knock a man over. He thought that experiments as to how long a Daguerreotype plate would keep between exposure and development would have some bearing on the subject.

Another speaker stated that Dr. Eder had recently published that the effect of shearing stress can be reversed by exposure of the plate to light.

Captain Abney had had more than nasal proof that the substance liberated by light from photographic plates is bromine. Nitric acid was the most doubtful of the oxidising agents for destroying the image. In the old wet plate process it was easy to develop an image on iodide of silver, then to dissolve it with nitric acid, and afterwards to develop the image again upon the same plate, and so on for a long time. The term "latent image" should not be used, for there is no latent image; the term "photographic image" would be better.

Mr. Bothamley thought smell to be an unsafe guide as to the substance thrown off by dry plates exposed to sunshine; it might possibly not be pure bromine, but a compound containing bromine.

Mr. W. T. Wilkinson on "Photomechanical Printing."

As the last item of the Camera Club Conference programme, Mr. W. T. Wilkinson gave a practical demonstration of the photogravure process. From the nature of the case demanding excessive care at each stage of the operation, and the late hour at which Mr. Wilkinson was called upon to give his explanations, the circumstances were not favourable to the production of a good result, and so it happened that the final printing process was never reached. Commencing with a clean copper plate, the speaker said that the first step was to lay the ground or "grain" the surface; this he did by shaking up a quantity of finely-powdered resin in a capacious box, lifting the lid to insert the plate, and allowing the resinous particles to settle like so much dust upon its surface. The attachment was secured by a spray producer, or the newly-invented "air-brush," finishing off on a hot plate. Upon this grained surface a reversed carbon print from a transparency was laid down, and then developed with hot water in the usual manner, the paper backing being removed, and all the soluble gelatine washed away in water heated to as high a temperature as the hand could conveniently bear. This done, the surface was rinsed with methylated spirit to quicken the drying, and then a resist varnish of gum dammar in benzole was applied. Now the plate was ready to be etched, and for this purpose it was laid face upwards in a dish and treated with an alcoholic solution of perchloride of iron. This latter salt slowly attacked the copper through the varnish layer, the iron salt having the effect of hardening or tanning the gelatine film, and the spirit induced a more regular action than could be got by the use of an aqueous solution. It required some experience to know how far to carry this etching process, and the margins had, of course, to be protected by asphalte during this operation. The plate was now ready, after washing off the ferric salt and cleaning away the carbon pictures and resinous coating, to be inked up and mounted for the production of successive impressions. This part of the process was "taken for granted," inasmuch as time had not permitted the operator to get a sufficiently deep etching; but Mr. Wilkinson showed some other plates, previously manipulated, which, in this respect, he regarded as perfectly satisfactory.

The Camera Club Dinner.

Last Friday night the annual dinner of the members of the Camera Club, and their friends, was held at the Frascati Restaurant, Oxford Street, London, under the Presidency of Captain Abney.

After the toasts of the Queen, the Prince of Wales, and the members of the Royal Family, Professor Meldola proposed that of "Success to the Camera Club," coupled with the name

of the President of the Club, Captain Abney, upon which the company struck up "For he's a jolly good fellow," and they gave him their emphatic assurance that there was no division of opinion upon that point.

Captain Abney, in response, said nobody could accuse him of too much partiality for the Club, for his attendances at its meetings had been few and far between, and he felt that he had not done his duty. The Club had been prospering; it had now nearly 600 members, and more papers were read before it than at any other ten photographic societies in Great Britain put together. Through the action of the Camera Club the Customs' examination of dry plates had been greatly facilitated, and now dark rooms for the proper examination of such plates had been provided at our various seaport towns. That day it had been seen that the Club had taken a step in relation to photographic exhibitions, and the Club had started the one man exhibitions. He hoped to see the time when no medals would be given at exhibitions, and that the simple fact of permitting photographs to be suspended on the walls would be considered sufficient honour. Soon the Club would enter into new premises with full accommodation, with eight or nine well-fitted dark rooms, also with workshop, laboratory, studio, enlarging room, and last, but not least, a billiard room. Nothing went into its journal but original matter; he had been editor of the journal of another society for several years, but had never found any committee or anyone to aid him with original matter. He would propose the toast of "The Photographic Societies of Great Britain and Ireland," coupled with the names of Mr. Mansfield, president of the Photographic Society of Ireland; Capt. Mantell, honorary secretary of the Photographic Society of Great Britain; and Surgeon-General Ranking, the representative of the Photographic Society of Leamington. He thought that the improvements, if any, in the Photographic Society of Great Britain had been due to the action of the Camera Club; he felt this to be a rather doubtful compliment, but he meant it.

Mr. Mansfield, in response, remarked that he thought all the photographic societies at a distance from London were grateful to the Camera Club for bringing them together; otherwise they would have been less able to make their voices heard in the management of photographic affairs, as exemplified in the discussion on exhibitions that day.

Capt. Mantell stated that an unexpected honour had been thrust upon him that evening, and had he known it beforehand he should not have enjoyed his dinner so thoroughly, but he was sure that all who had attended the Conference that day must have been thankful for all the work it had done.

Mr. M. Smith said that the Camera Club was a social organisation, and had social gatherings each year to which it invited a certain number of visitors. Among their visitors that evening were Professor Meldola, M. Paul Nadar, of Paris, M. Lafort, Mr. Rossi, Mr. Chapman Jones, Mr. H. Bothamley, Mr. W. T. Wilkinson, Mr. W. H. Harrison, Mr. Welford, Professor Stebbing, of Paris, Mr. H. Harriden, Mr. A. Cowan, Mr. Turner, Deputy Astronomer-Royal, Mr. O. Smith, of Stockholm, also the manager of the Nobel Explosive Co., and Mr. Mead, of the Alpine Club. He would couple with this toast the names of M. Nadar, Mr. Mead, and Mr. Frank Braine.

M. Nadar, who spoke in French, said that it was difficult for him to speak English, and that he wished success to the Camera Club.

Mr. Mead responded that his knowledge of photography in Switzerland for many years consisted in stumbling over the legs of camera men at Swiss Hotels; of late years, however, he had stumbled on higher ground, and photographed several Swiss peaks.

Mr. Braine explained that he was a bashful and retiring man, and that he had brought a friend to return thanks for him; that friend was Mr. Edwards. He had met Mr. Edwards on board the French steamboat between St. Malo and Dinan. The friend then told a story, not strictly photographic, about a man with a pickaxe.

Sir David Salomons then proposed "The Press," coupled with the names of Messrs Harrison, Hastings, Sturmey, Wright and Horsley Hinton. He was not in favour of anonymous journalism, and thought that every article should have the name of the writer appended thereto.

Mr. Macey Wright responded, that in making a speech he felt like the man who, when going to bury his wife, remarked, "I cannot go in that carriage with my mother-in-law; if I must, I must, but you will quite spoil my day's pleasure." He was glad to hear that the Camera Club was going into new premises, and thought that the Provincial Press would be ready to aid it in giving publicity to its ideas if country newspapers were regularly made acquainted with its desires in that respect.

Mr. W. H. Harrison agreed with Sir David Salomons in not being in favour of anonymous journalism; he also thought, with the Camera Club, that the editors of photographic journals should have nothing to do with exhibitions or other executive work in photography, on which they might afterwards have to comment in another capacity; they should stand outside such work as free and independent spectators. In like manner, he thought that public workers in photography, who posed before the public as men submitting to free and impartial criticism, should not in their private capacity be shareholders in newspapers. He was glad to see the culture and education which characterised the proceedings of the Camera Club, and that it had an excellent honorary secretary, for those experienced in the working of organised bodies were aware to what a large extent their prosperity is due to the capacity of the working secretary.

Mr. Hastings was pleased to hear about the new premises, and hoped that the new home of the members would be in every way a credit to the Club.

Mr. Sturmey's connection with photography had been a short one; he, too, thought that articles should be signed. He then told some anecdotes about the errors of amateurs, and entered into some details relating to his journal.

Mr. Horsley Hinton made some brief remarks, which were imperfectly heard at the other end of the room.

Mr. Herbert Harraden then sang a song, "The Photographic Fiend."

The President next gave the toast of "The Officers of the Camera Club," coupled with the names of Mr. Ferrero, managiug director of the Camera Club; Mr. George Davison, honorary secretary; and Mr. Asbury Greene.

Mr. Ferrero felt more at home in reminding members about arrears of subscription, than in making after-dinner speeches, but the greatest pleasure next to doing one's duty was to know that it was appreciated. He spoke highly of the work done by his predecessor, Mr Spiers.

Mr. Davison said that without such work for the Club as that given by Mr. Ferrero, all would come to a standstill. His (Mr. Davison's) own work was easier because more interesting; he had an interest in his kind friends of the Camera Club, but regretted being kept somewhat from the study of photography. The summer months, however, for which they were pining, were coming.

Mr. Asbury Greene, as one of the original members of the Club, would be glad to do all he could for it in the future.

Mr Charters White told a humorous anecdote or two, after which the company separated,

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Cleanliness in Photography.—On one occasion Lord Palmerston was asked for his definition of dirt. He promptly replied that it was matter in the wrong place; so if, after a peep into your neighbour's dark-room, you see pyro, soda, and other chemical stains in stream-like courses on the outsides of bottles and graduates, then you can draw a direct conclusion that the operator or his assistant is negligent, and it is impossible for him to get perfect negatives. The matter on the outside of his bottles will, while handling, drop into his developer, thereby causing streaks, stains, pin-holes, and an endless train of other evils which will sometimes work an irreparable injury to a properly posed and well-lighted negative. —B. F. M'Manus.

ON DIFFERENCES OF COLOUR-SENSITIVENESS AT DIFFERENT TIMES.*

BY PROF. H. W. VOGEL.

It is recognised that the quality of the light varies considerably in the course of a day. According to the height of the sun and the more or less murky condition of the atmosphere, a greater or smaller proportion of light is received direct from the sun on the one hand, or reflected from the sky on the other hand. As one or other of these sources of illumination comes into play, the character of the light changes in a noteworthy manner. So long as we worked with collodion plates and iodide of silver, it was the indigo coloured light that was essentially important (spectrum line G). Violet and ultra-violet light, which would also come into the reckoning, are, in fact, so little reflected by solid bodies, that the said rays need not for ordinary subjects be taken into account, although in photographing heavenly bodies they play an important part.

Since the introduction of dry plate photography, the maximum of activity is removed towards the bright blue (half-way between the lines F and G), and at present the photographic intensity of the light depends upon the quantity of bright blue existing in it.

With the introduction of colour-sensitive plates the matter again undergoes an important change. Since it has become possible to prepare plates which are from six to ten times as sensitive to yellow as to blue, the amount of yellow and yellowish green present plays a most important part. I made the observation so long ago as the year 1874 that the chemical action of the solar spectrum varies considerably at different times, especially towards the ends—that is to say, the violet and the red and yellow. I was working with colour-sensitive plates, and found this effect even with the sun at the same height and the weather apparently similar.

In the year 1875, during my voyage to the East Indies, I made a set of spectrum experiments in the Red Sea and Indian Ocean with collodion plates, the sensitiveness of which was about equal to yellow and blue. Five photographs of the spectrum were taken daily. On one day I found that the action of the yellow greatly exceeded that of the blue, and this in the afternoon and at midday, as well as in the morning. This can only be explained on the assumption that on that particular day the yellow light in the atmosphere was very overpowering, for what reason I know not.

Since colour-sensitive plates have come into regular use, it has happened to me that in photographing the same object under apparently similar conditions as to weather, the colour-sensitiveness of the same plates has shown decided variations. It has happened that a bouquet of flowers, which, at the Imperial Technical High School, has served as a test object for colour-sensitive (cosine silver) plates, against the ordinary plate, would sometimes show a very striking difference between the action of the two, whilst at other times the difference would be exceedingly slight.

Finally, I observed that colour-sensitiveness showed to least advantage on those days when, with a half-veiled sun, a sort of greyish light prevailed, in which objects appeared without brilliancy. All the phenomena considered, it seems that the intensity of different coloured light in the atmosphere, even when there is no difference perceptible to the eye, varies considerably. Sometimes the red and yellow predominate; sometimes blue. In the latter case, the effect of colour-sensitiveness is least noticeable. Further experiments on the subject are in course of being made.

* Translated from the *Jahrbuch für Photographie*, 1890, for the PHOTOGRAPHIC NEWS.

SEVERE TESTS OF COMPRESSED GAS CYLINDERS.

THE Scotch and Irish Oxygen Co., of Polmadie, Glasgow, ask us to publish the following interesting account of the severe testing of compressed gas cylinders, which appeared in *The Glasgow Herald* of March 13th:—

A series of experiments was conducted yesterday at Stevenston by the Scotch and Irish Oxygen Company, Limited (Brin's Process), for the purpose of demonstrating the absolute safety of their cylinders for containing compressed gases. It will be remembered that a fatal accident occurred to the foreman of their Works at Polmadie by the bursting of a cylinder some six weeks ago, and the impression was conveyed to the public that the explosion was due either to some defect in the cylinder, or to its strength being overtaxed by being charged to an excessive pressure.

A thorough investigation was, however, made into the cause of the accident, and the facts disclosed left no doubt that it occurred through a mistake on the part of the unfortunate man himself. It was clear that he had introduced oxygen into a cylinder which was already partly charged with hydrogen, these gases forming an explosive mixture when brought together. One fact especially which pointed at once to this conclusion was that the main portion of the exploded cylinder, found almost on the spot where the accident occurred, was almost too hot to be touched; whereas, the portions of cylinders which have since been intentionally burst by being subjected to excessively severe treatment were found to be perfectly cold. In consequence of this erroneous impression it was thought advisable to subject the cylinders to an exhaustive series of tests, so as to prove beyond dispute that they are thoroughly adapted for the purpose of carrying the gases, and capable of withstanding the most extreme amount of rough usage to which they can possibly be subjected during transit from place to place.

The cylinders used are of different sizes, varying from 1 foot long by 3½ inches diameter to 6 feet 6 inches long by 5½ inches diameter. They are made of mild wrought steel ¼ of an inch in thickness, and before being used each cylinder is subjected to a hydraulic test of at least twice its working pressure, and is afterwards stamped with the pressure to which it was subjected, the date of the test, and the test mark. The cylinders are re-tested periodically, and for the purpose of safety the custom of the Company has been to paint those for the different gases in distinctive colours, so as to avoid the danger of mixing. As a further precaution, every cylinder which is brought into the works after having been in use, is at once emptied.

To make the recurrence of such a misfortune as the recent accident absolutely impossible, it has been decided to adopt a left-handed thread for the valves on the hydrogen and coal gas cylinders, so that by no possible inadvertency can they be filled at the oxygen pump. A number of experiments were made about ten days ago which gave excellent results. A 6 feet 6 inch cylinder, weighing about 1 cwt., was twice raised to a height of 35 feet, and

dropped horizontally upon a solid iron block 12 inches square and weighing 3½ cwt., each blow bending it to the extent of about three-quarters of an inch. It was then dropped vertically on to its round end, having a clear fall of 31 feet, when it was found that the impact had only flattened a part of about the size of a pennypiece. It was next placed across the iron block, and an iron weight of 6¼ cwt. dropped on to its centre from a height of 35 feet, the blow crushing in the side to the extent of ⅞ of an inch. The cylinder was subsequently placed on two iron blocks, set 4 feet 1 inch apart, so as to support the ends, and the same weight again let fall upon it from the same height, with the result that it was bent 4¼ inches from the straight, but did not explode.

Another cylinder was afterwards tried in the same manner, with the exception of the crushing blow, and in this case even a more satisfactory result was obtained, as it was bent to the extent of $7\frac{5}{16}$ inches by the bending blow, and still remained intact. A smaller cylinder, measuring 31 inches long by 5½ inches diameter, containing 17lb. liquefied carbonic acid gas, was also dropped crossways and vertically from the same height, and was afterwards flattened to the extent of 1¾ inches by dropping the 6¼ cwt. weight upon it, without injuring it otherwise than in shape. Each of these tested cylinders was subsequently found to contain the full quantity of gas, and to be perfectly sound. Yesterday's experiments were of a similar character, and were equally satisfactory. A 6ft. 6inch cylinder, weighing 107lb. including the contents, was dropped four times across the iron block from a height of 35ft., these trials producing a bend of 2⅛ inches. It was also allowed to fall on its end, with little perceptible result. A smaller cylinder was treated in the same manner, and sustained no greater injury than a few dents.

From these particulars it will be seen that the tests were eminently satisfactory, for it is inconceivable that such cylinders during transit could undergo anything like the severe treatment to which they were subjected, while it was evident that they still possessed a considerable reserve of strength.

PHOTOGRAPHING A SPEAKER'S GESTURES.

About a year ago, Mr. Edison became intensely interested in instantaneous photography in its possible availability in connection with the phonograph, and at once began an exhaustive series of experiments in that direction. The first thing was to develop the possibilities of the camera as to rapidity of exposure, and an elaborate system of experiments was begun to try if possible to photograph a rifle bullet in its passage through the air at its maximum initial velocity of 5,000 feet a second. To do this successfully no known mechanical means were adequate—5,000 feet means 60,000 inches, an inch being about the length of a rifle bullet. But to secure a perfect picture of a bullet moving at this extraordinary velocity it must apparently be at rest, and hence the actual time of exposure must be brought down to incredibly infinitesimal limits.

The great inventor at once harnessed the lightning to do the work, and before the camera arranged a series of vertical wires so fine as to be practically invisible, and so connected that the breaking of any one of them would complete an electrical circuit and furnish an illuminating spark for the two-hundredth of a second. At first the experiments seemed to be fruitless, as the rapidity was such as to exceed the limits of sensitiveness of the plate in the camera; but weeks of careful experiment brought a solution in a new combination of sensitising chemicals by which even this infinitesimal period of time sufficed for a perfect image.

But a new difficulty arose. The slight imperceptible tremor of the room in which the experiments were conducted, caused by the motion of the machinery and dynamos in another part of the building, was sufficient to destroy the sharpness and value of the photographic image. This was overcome by erecting a special building for the purpose, and placing the camera on a pier of solid masonry running down to the primitive rock. Then, and then only, it was that success attended the experiments.

But the reader will doubtless ask the question, *Cui bono?*—what possible good was it to get a picture of a rifle bullet showing the condensation of air in front of it, the vacuum behind, and the air eddies that were thus created? Much every way! Not only as a practical means of studying the best form for a bullet in overcoming the resistance of the air, but more especially as a means of developing the great idea that Mr. Edison had in his mind of bringing photography to bear as an adjunct to the phonograph. He thought that if a speaker's personality could be brought before the eye by means of photography and the stereopticon while the phonograph was bringing the subject-matter before the ear, that an important end would be gained, and to accomplish this the elaborate series of experiments was planned and carried out. The result has been the most marvellous success and the most wonderful machine it is possible to conceive.

Let the reader imagine a popular lecturer, preacher, or orator delivering an address. In front of him, at the so-called reporters' table, are two small machines, one the well-known phonograph, and the other an ingenious piece of mechanism by which photographs of the speaker are taken in succession with enormous rapidity—at intervals, let us say, of from one-eighth to one-twentieth of a second, and suppose both these machines to be at work silently recording both the uttered speech and the personal appearance of the speaker at each fractional part of a second. The results thus obtained may be sent to any desired point, and the photographs thrown on a screen by an ingeniously contrived piece of mechanism. Thus the exact appearance of the speaker, with all his gestures and play of features, are exactly reproduced, while the phonograph simultaneously delivers the speech. The interval between the successive photographs is so infinitesimal that the screen picture is apparently a living one, moving, gesticulating, and apparently uttering the words which, in fact, are spoken by the phonograph. The greatest difficulty experienced by Mr. Edison in his experiments was the synchronization of the two instruments, so that the utterances of the phonograph should exactly coincide with the gesticulations; but this was finally overcome, and the experiments were crowned with the most perfect success. What the commercial value of the invention may be is yet to be decided. It cannot fail to be intensely interesting as an exhibition feature, but whether it will fill a useful niche in the every-day life of the world is another question entirely.

Mr. Edison is not pushing the matter at present, being absorbed in his experiments on electrical traction for street cars. When that problem is decided he may bring this new invention prominently before the public. We wait.—*New York Herald.*

MOUNTING LANTERN SLIDES.

So far as we can gather, there are only two reasons for, or advantages to be gained by, the system of what is generally called uniform mounting: facility in carrying on the operation consequent on the use of mats already cut, and the pretty appearance of a set when so mounted. The first is unworthy a moment's consideration; and anyone who would let it influence him had better at once turn to some other hobby, or wait till he can mount his slides by a "drop a nickel in the slot machine." A good deal can be said in favour of the other reason, as the chief aim and object of at least a large quantity of the photography of the present is to satisfy the craving for the beautiful; and if the disadvantages of uniformity under circumstances where it should not be sought, were not out of all proportion greater than its advantages, we should not have so much to say against it.

So long as the results of photography were merely curiosities, people were content with simply wondering how such things could be, and even the initiated were too much intent on improving the technical to give much consideration to the artistic; but now that the technical has reached a stage only a little short of perfection, photography is more and more assuming in men's minds its true position—not itself an art, but only the means by which artistic results may be produced. In other words, and words more especially applicable to our purpose, lantern slides are gradually becoming less and less looked at and thought of as photographs, and more and more regarded as a means of producing on a large scale projections that shall be in the truest sense of the word pictures. We are aware that there is at present a school, or a few weak enthusiasts who would fain be considered such, which sneers at rules of composition and canons of art; and, perhaps, for them, and the kind of work they show, when they do show anything, rules, laws, and canons are not needed. But the great body of sober-minded artists, the men of light and leading, both ancient and modern, have given, and are giving, ample evidence of their faith in what may be said to be the great principles of light and shade, and composition.

We may take it for granted that a very large majority of the lantern slides that are made, except by those professionally engaged in their production, are from negatives not especially taken for the purpose, and, consequently, better suited for either upright or horizontal pictures. From negatives of 4 by 5 and under, the positives, as a rule, are printed by superposition and, of course, by reduction in the camera from larger sizes. Now, it will be evident that if the composition has been good for an upright or a horizontal picture, and the whole plate filled, an equally good composition cannot be made to fill the square opening of the regulation mat, and the attempt to do so can only result in the cutting out of material necessary to proper balance, excessive and often, in consequence, offensive foregrounds, weakly-placed horizon lines or vanishing points, and other equally objectionable faults.

But we may ask, why should lantern pictures be square, or nearly so? Artists of the brush are deservedly credited with a fairly good appreciative taste in such matters, and we are within the mark in saying that less than one per cent. of the frames that adorn our galleries, either public or private, are of that form, and even of those few, for most of them there is some special reason for the choice of the direct square.

The true artist, then, in making lantern slides from his ordinary negatives, will arrange so that the longest side of the composition shall come just within the regulation mount, as uniformity in the length or height is easily obtainable, and of course let the sky and foreground take care of themselves. In mounting he will, of course, see that the mat is suitable to the horizontal or upright so made, and although the slides may not look so pretty when simply looked at, they will, when on the screen, fully reward him for all the extra trouble he has taken.

But, notwithstanding those facts which "are chiels that winna ding," we know that there are some who, octopus-like, will continue to cling to "the good old size and shape," and as they, if they are not to fall behind, must cease to be content with photographs and strive after pictures, the following suggestion may help them to make a fairly satisfactory compromise.

If the stickler for the regulation mount believes in the adage, "whatever is worth doing, is worth doing well," he will not mind a little additional trouble and a little extra expense in carrying out his desires. Before going to the field, he should mark off, by a heavy pencil line, a direct square on his focussing screen. If, say, his camera is an $8\frac{1}{2}$ by $6\frac{1}{2}$, a square of six inches will be suitable. He should then take all his pictures in duplicate, the first filling the full size of the plate, and the second confined within the limits of the square. He should remember also that faults in composition are more noticeable on a large than on a small scale, and take especial care in the arrangement of the second exposure. In this no pains should be spared, and no time grudged or thought misspent, and an exposure should never be made on a subject that is not in every way satisfactory. Better a clean plate than a picture that needs to be apologised for.—*The Beacon.*

Devon and Cornwall Camera Club.—On Monday, 17th, at the Athenæum, Plymouth, Mr. S. Weekes passed through the Club lantern about two hundred slides of his own making and from his own negatives, making appropriate remarks upon each. The lecturer led the company from Plymouth to the South of France, thence to Venice, Rome, the Italian Lakes, Switzerland, and back to Devon and Cornwall, winding up with groups of persons associated with the Club either as members or friends.

The Sizes of Photographic Plates.—In one part of the final report of the International Photographic Congress at Paris, dealing with the question of "Uniformity of Dimensions of Plates," a normal international plate 18 by 24 centimeters ($7\frac{1}{8}$ by $9\frac{3}{8}$ inches about) was adopted. The division 12 by 18 centimeters was also adopted, and the divisions and multiples of 18 by 24 centimeters. In the matter of sizes of lantern slides, the form $8\frac{1}{2}$ by 10 centimeters ($3\frac{1}{2}$ by 4 inches about) was adopted by a vote of 18 to 13. Another size proposed was 9 by 12 centimeters, but was not adopted because it was thought to be too large. The screw for attaching the camera to the tripod was also considered, and the following size was adopted: Its diameter shall be 9·5 millimeters, with a thread cut an isosceles triangle of 55 degrees opening running to the summit, not more than 1·6 millimeters deep, and having a pitch of one-sixth of its height. This is the $\frac{3}{8}$-inch screw of the English system of Whitworth, adopted by the Photographic Society of Great Britain in 1882. For the attachment of lenses of different sizes to the same camera, a system of universal screws was adopted upon the same system as that mentioned above, and with sufficient play to allow easy working. The screw flanges for all new lenses made in the future are recommended to be cut with exterior openings having 10, 50, 75, 100, 125 millimeters.—*Anthony's Bulletin.*

Notes.

The likeness of the new German Chancellor, General von Caprivi, to his predecessor, Prince Bismarck, is a happy coincidence. Prince Bismarck used to have a double, who was accustomed to sit to unscrupulous photographers in Berlin, and whose photographs were sold as those of the Chancellor. This fraud went on for some time, but was at length discovered, and the "double" found his way to durance vile. Those who wish to turn—we will not say an honest penny—will probably be tempted to pass off the photographs of the old Chancellor for those of the new one. We mention this so that purchasers may be on their guard.

A lady correspondent of an evening paper has made the astonishing discovery that the portraits of curates and other smaller religious lights are not only exhibited in suburban shop windows, but command a ready sale. The announcement is rather late in the day, as from the earliest photographic times a suburban photographer invariably seized upon the countenances (if he could get them) of the local ministry, both of the Church and Dissent, as a good advertisement. But the lady writer goes a little further; in fact, she has a "good idea," and has come forward to assist ladies of limited means. Her suggestion is that a number of ladies should form themselves into a company for the sale of curates' photos. She is confident the profits would exceed all expectations, as the number of ladies of all ages who are ready to expend their spare cash in purchasing the photos of their pet parsons is very large. Moreover, the young ecclesiastics themselves, in so good a cause, would willingly "countenance" the work. There is, unfortunately, a frivolity about this last observation which makes one doubt the sincerity of "A Feminine Observer," for so the writer signs herself. We are really afraid she is having, under the guise of philanthropy, a quiet laugh at the curates.

At last the automatic drop-a-penny-in-the-slot photographic apparatus is an accomplished fact. At present it has its habitat at West Bromwich, where a demonstration took place the other day, and as the circumstance has been narrated in all its details in the financial papers, we may take it that the patent will occupy the attention of a limited liability company. Mr. G. A. Sala—who, like a true journalist, has always his imagination on tap—sees possible drawbacks in the invention. He entreats the patentees very properly to guard against the following contingencies:—First, the malevolent small boy suddenly crying out, "Shove in your mouldy coppers!" or "Hi, there Mister!" just as you have begun to stand motionless; second, a violent fit of sneezing or coughing; third, the uncalled-for interposition of an entire stranger, who, at the critical moment, pops his head over your shoulder, grinning horribly, and gets photographed for nothing on the unhandsome and untradesmanlike plea that it is "the same concern." Mr. Sala has really spotted the initial difficulties in the way of the success of the apparatus, and it will be interesting to see how they will be overcome.

A photographer in one of the large provincial towns has found his business greatly increase, and his photographs more pleasing to his customers, since he has employed a young lady of prepossessing appearance to assist him in the studio. When a nearly full face is required, and the eyes are to be turned in the direction of the camera, he gets the young lady to take off the cap. If the best view of the features necessitates looking away from the camera, the lady assistant plants herself at the required spot, and with pneumatic attachment makes the exposure all the same. The essential point is that the sitter shall turn his eyes towards the fair asistant. We use the word "his" advisedly, as we are not ready to believe the plan would answer so well with feminine sitters.

Sterne's oft-quoted sentiment, "they order these things better in France," has received a fresh exemplification from a photographic point of view. In a recent murder case which has just excited some attention in Paris, the victim, Hippolyte Richard, was by profession a canvasser for photographers. With that nice discrimination and attention to details so peculiar to the French mind, his arrangement with his employers was based upon the distinctions which exist between the representatives of various classes; that is to say, a customer was not a customer and nothing more, but varied considerably in value according to his or her position and notoriety. In fact, a sort of tariff appears to have been established, of which the following formed the leading items:—For every deputy he introduced he was to receive 5 francs; for a senator, 3 francs; for a negro potentate, 10 francs; for an actress taken in ordinary costume, 20 francs; and for an actress taken *decolletée*, 20 francs. We in England have not yet approached this perfection of tabulation.

It is impossible to exaggerate the future importance of photography in regard to astronomical observations. At no distant date the world will be spotted with observatories all filled with photographic appliances, and all collecting records of the heavens, which will be of the utmost service when compared together. The latest additions to the world's observatories comprise one at the Vatican and one recently established by the Catholic Mission at Madagascar, where a building has been erected on a hill about 4,000 feet in height, and situated a short distance to the east of Tananarivo. The first-named, so far as astronomy is concerned, will concern itself principally with celestial photography. In the second a photographic telescope for solar observations will be provided.

CHILDREN.

BY A PHOTOGRAPHER.

M. Legouvé, writing of Madame de Staël, informs us that she died talking. When her friends were nervously solicitous to exclude visitors who, moved by affection, or fashion, or curiosity, or, lastly, by a common but ghoulish gluttony of distress and agony, pressed for admission to the bed-chamber in which the accomplished authoress lay dying, she is reported to have rebuked them, and to have insisted on her visitors' admission. "Let them come in," she cried, "let them come in; I thirst for the human face—*J'ai soif du visage humain!*"

This thirst for the human face, which Robinson Crusoe must have felt in its deep desire and insatiable longing, expresses, undoubtedly, one of the most ardent passions of humanity throughout all time. We have all a thirst for the human face; but the photographer is perhaps possessed by it in an exceptional degree, and has been known, whether as professional or as amateur, to undergo considerable risks in his attempts to quench it. Our memories are green of the gentleman who proposed, in defiance—or rather, perhaps, in ignorance—of the Koranic law, to take a portrait of the Sultan of Turkey.

In what considerable measure this thirst is shared at the present day by the general public, any reflecting observer may find out by taking up his position in front of a stationer's shop in a popular thoroughfare—say, for example, in Regent Street—where the photographs of celebrities of the season are exposed for sale. There the hero or heroine of the hour, strong man or fashionable woman, convicted murderer or military chief, draws the noses of the crowd in such close proximity to the glass of the shop window, that a greasy film soon settles upon the pane, only to be rubbed off by a fresh band of inquisitive investigators. "No mere curiosity, however, is this," say the amiable apologists of human nature; no silly love of distraction, no empty frivolity of idleness. No! the street crowd of which the component elements are only too familiar, is thirsting for the human face, because it is thirsting for the human soul! It may be so; but is the photographer similarly affected? It is extremely doubtful. In the case of children, the contrary has been too often the case with him. He has thirsted for the human soul, because he has thirsted for, and failed to obtain, the human face. Failing to take the child from life, he has yearned to take life from the child.

The charms of infancy have been in every age and country a subject on which prose writers and poets have been allowed to dilate without let or reprehension. Euripides, in his "Meleager," a piece which the public, and especially the male adolescent portion thereof, will regret to hear has been lost in the lapse of time, has not omitted to give vent in verse to the following ideas, which Stobæus, the author of the Latin Anthology, has been kind enough to preserve: "Sweet is the sun's light, sweet is the sight of a calm sea, or a mighty river, or a land in spring—a thousand other things are sweet—but believe me, there is nought sweeter than to see, after a life of celibacy, beautiful children flourishing in our home." This sentence seems somewhat strange—strange enough, indeed, to cast a doubt on the authenticity of the fragment—when it is remembered that Euripides was a confirmed misogynist, and "said things" about women which it would be painful to repeat in any publication laying claim to an iota of respectability.

The charms of infancy and of childhood have inspired poets of imagination all compact to sing of the fair heads, the curly hair, the sparkling looks, the rosy lips, and the smiling cheeks—poets apparently oblivious or ignorant of the constant worry, the strange perversity, the nocturnal peevishness, the mulish obstinacy, and the congenital deceit—from the days of Euripides till the days of Victor Hugo, who has distinguished himself in some degree as the children's poet. The *Orientales* and the *Contemplations* savour much of this simple theme, and a poem of two dozen lines is devoted to the description of a child dreaming of sand full of diamonds, and other strange matters—perhaps the result of an overburdened stomach—in a soft cradle set in the secure shadow of the maternal bed. There have been photographers, it is whispered, who devoutly wished that the condition of the poet's child was chronic in the infantile world—that children, if not dreaming, might at least be continually asleep. They would not, they believe, under these conditions, have been called upon to take their portraits, or if they were, it might have been done with ease.

But to photograph a child awake! This is the work, this is the labour. A man must be to the manner born to accomplish this. I speak of the past rather than the present, but the present is not all plain sailing. The strange difficulty of the undertaking, the indomitable perseverance which it requires, can scarcely be conceived by the outside world. It is hidden from all save those unhappy ones who have experienced it.

The greatest reverence, says a celebrated satirist, is due to the child. I fully concur with the justice of this observation in the abstract—but Juvenal was not a photographer. If he had been, and had been asked—we will suppose—to take the portrait of his friend Sempronius's little boy, and had maintained his reverence for that child unimpaired after the operation, I should hold a higher opinion of Juvenal. Job is commonly credited with the virtue of patience; he did not, indeed, manifest this virtue to any very great extent when he cursed his day—nevertheless, the patience of Job has passed into a proverb. I trust I shall not be accused of irreverence when I say that to take the portrait of a child requires something more than the patience of Job.

Bairns, says a Scotch proverb invented before the days of photography, are a blessing; to the photographer they are only too commonly—well, to avoid any strong language, I will say—the reverse. They cannot and will not be taken, and, like the child of Themistocles who governed his mother, who governed her husband, who governed Greece, their will is supreme. Not that there is not plenty of counsel on the subject how the thing is to be managed; but it is like that of the conjuror who professes to tell you how to do it. In the moment of need the counsel pierces your hand, or slips from you like uncertain quicksilver. For instance, there are some counsellors who will talk of an infant, wholly forgetting the great reverence due to it, as if it were a dog or a horse. You must study—say these wise ones—its points; you must approach it gradually, or like an old acquaintance (imagine any child of ordinary capacity being deceived by so transparent a device); you must show a love for it; this is indeed a trial; and you must stroke it down, and talk sympathetically to it.

A gentleman who speaks, as it were, *ex cathedra*, says: "I find the following method most successful in dealing with this difficulty. On the arrival of the youthful sitters in the studio, I place them at once in the proper focus, and,

after a general adjustment, leave them to themselves during the time I make the requisite preparations." Now, as to the proper focus, it is quite certain that those children, unless children of a wholly abnormal character, would quickly move out of it; and as to leaving them to themselves—well, I have had my own experiences. There is a tale of a child, who, being left to itself, was incontinently poisoned by drinking a solution of cyanide of potassium. "Then," says the gentleman, "I finally adjust the children according to my already preconceived ideas, and attract their attention." Quite so! Various methods of doing this have been suggested and proved in practice futile. One will tell you to move about some showy toy or other, a certain way of putting the child on wires throughout the sitting; another will counsel you to imitate the mooing of a cow, the buzzing of a bluebottle, or the barking of a dog, careless of the ridiculous loss of dignity which is thereby incurred by the artist, and all too frequently to no purpose. The ordinarily lively child will, by such ill-judged proceedings, be transformed, as by some unholy spell, into stone; it will regard all your dramatic endeavours with concealed indifference, or with a calm and open contempt; it will assume a suspicious, if not a sulky expression. The graceful forms which we are told all children unconsciously assume will, by some prepense malice, some instigation of Satan, be wholly absent in this child; and when, after endeavours frittered away, and wasted energy, after much loss of time and more loss of temper, you at last, in sheer despair, say, "Now is the time!" and uncover the lens, the probability, amounting almost to a certainty, is that the child will have moved, and a satisfactory picture will not have been obtained.

There is a photographer, an intimate friend of mine—a man of considerable skill—a man, I may say, for I knew him well, of genius, kind, amiable, gentle, and long-suffering, whose evil lot it was, some years ago, to be asked to take a picture of oh, such a sweet child! But a difficulty occurred at the very outset which should have been, but unfortunately was not, a warning to that artist. The sweet child, the dear artless little thing, a boy in his tender nonage, stoutly refused to go to the photographer's studio, and insisted, like a young sultan, on that artist being brought to his own apartment. A doting mother, to whom the child's will was law, in her earnest desire to possess a picture of her darling, gave way to this arrangement, not, indeed, being able to do otherwise; for as soon as an expedition was proposed to the studio, the little tyrant filled the neighbourhood with loud lamentations. And so the photographer came, with all appliances and means to boot, into the nursery. Trailing, not, indeed, as Wordsworth imagines, clouds of glory, but a little go-cart attached to a string from an adjoining apartment, this interesting child approached the artist, and leisurely examined him with much the same kind of sympathetic and interested curiosity as is shown to the student of human nature by that portion of the public which, on a Bank Holiday, delights itself with a prolonged examination of the monkeys in the Zoological Gardens. After this examination was concluded the photographer, anxious to propitiate the subject of his future proceedings, fumbled in his pocket and produced a parcel. "What is that?" said the infant. "That, my dear, is a box of sweets, which I shall have the pleasure of giving you if you are a good boy"—and here he arranged his camera—"when I go." "Give it me, then," said the boy, "and go at once!" "There are," says Cicero, "children who need the bridle, there are others who require the spur." Evidently this child was not to be included under the latter category. My friend—my injured friend—never confided to me whether he was in a pet at this precocious *enfamure*, or whether he had some doubt as to the propriety of giving to posterity the portrait of so impolite an infant; but it is certain that he then and there collected his chattels together and took his departure, probably with the indignant Gloster, in Lear, saying, *sotto voce*—

"I shall see
The winged vengeance overtake such children!"

There was a piece of mechanism—not yet quite extinct—employed in photography known as the head-rest. It was probably so named on the *lucus a non lucendo* principle. Now this is an instrument which even adults are not altogether disposed to look upon with delight. Its screws and articulations give it an uncanny appearance; it is suggestive in some remote way of a dentist's chair. The child, as a rule, rebels against it at once. Instances have been known in which children have been thrown into strong convulsions by an injudicious appliance of this machine. Some kindly intentioned French person once patented a special head-rest for their proper use. Its distinctive feature was the greater curvature of those long thin branches, which convey to the fanciful observer the idea of the tentacles of a squid. These branches, by a neatly worked movement like that of calipers, embraced both sides of the infant's head, underneath its hair. The writer—he mentions the fact with a feeling of fervent gratitude—has had no experience of the effect upon the child of this mechanical construction, but the inventor thereof was clearly not altogether sanguine about its success. He speaks with no manner of certainty, but he speaks as one who has suffered, and he speaks without the reverence recommended by the Roman satirist. By the use of this instrument, he says, the portraits of these little devils (*ces diablotins*), who are the curse of the photographer of every country and of every time, may *perhaps* be taken successfully.

It is told in the "Memoirs" of Alexander Dumas, concerning the savages of Florida, that when they were especially wroth with a prisoner, and anxious to torture him in the most prolonged and painful manner, they committed him to the care of a select circle of women and children, who, in the cruel subtilty of their devices for ensuring the highest amount of agony, left nothing whatever to be desired. It is the unhappy experience of a large number of professional photographers that the children of savages are not by many lengths in advance of the children of civilization in the capacity of the latter to inflict mental pain.

The Daguerre Monument.—We have received several letters criticising rather severely the design for the Daguerre monument. The general tenor of these communications is that Daguerre is placed in too subordinate a position, and that the female figure and the sphere are too prominent. In regard to these critics, we would state that we agree with them as far as the published designs are concerned; but we understand that we must withhold our judgment until Mr. Hartley has finished the large clay model which he is now working upon at his studio. This model is soon to be placed on public exhibition in New York, and all interested will have an opportunity of seeing it. The changes made in the model are: reduction of the size of the sphere, elevation of the sphere, an increase of the size of the head of Daguerre to one and a-half life-size, and the total height of the monument will be sixteen feet from the ground.—*Anthony's Photographic Bulletin.*

PHOTOGRAPHY IN GERMANY.

BY HERMANN F. GUNTHER.

Professional Development—Flat and Greyish Platinotypes—Price of Albumen Paper — Influence of Development on the Deposit on Negatives—Quinol Developer with Calcium Bisulphite — Platinum Toning for Gelatino-Chloride Paper.

Professional Development.—In order to ascertain what developer is chiefly used by the German professional photographers, and to give a correct idea of the mode of development in general every-day practice, the editors of Liesegang's *Photographisches Archiv* have sent round inquiries among the most eminent photographers in Germany and Austria, and the results of these investigations have been published in the last few issues of that interesting journal. In the first place, the following two facts have come out: that the ferrous oxalate developer is still used by about two-thirds of the German photographers, and that next to it the new eikonogen developer has found the most numerous and most exalted followers. The pyro developer seems to be employed by only a small number of practitioners. As to the eikonogen developer, the following communications are of special interest. A court photographer of Wiesbaden says: "It allows a shorter exposure than any other I know of; it gives fine details, works neither too monotonously nor too hard, and develops quickly. In the studio, I expose, even on dull winter days, with an aplanatic lens, full aperture, for less than one second, and in summer a quarter of a second is enough. I use the following composition:—

A.—Distilled water (hot)	1,500	c.c.
Chem. pure sodium sulphite ...	100	grammes
Eikonogen	50	,,

This stock solution must be kept in a dark-coloured bottle with glass stopper, and in a dark room in which no acids and no ammonia are kept.

B.—Distilled water	500	c.c.
Chem. pure potassium carbonate ...	75	grammes

(Stock solution 2). Mix 3 parts of A with one part of B just before use. This developer can be applied to from three to five plates the same day, if well protected against air and light. Wash the plate, if sufficiently developed, under the tap by means of the ball of the hand: harden it in a five per cent. alum bath for one minute, wash again thoroughly under the rose by means of the ball of the hand, and fix in—

Water	800	c.c.
Hypo	200	grammes
Bisulphite of soda (chem. pure) ...	40	,,

Another court photographer, of Altenbourg, proceeds as follows:—12 grammes of eikonogen in crystals are finely pulverised in a porcelain mortar, and the resulting powder is poured into a funnel the aperture of which is plugged with cotton, neither too loosely nor too firmly. On it are poured 50 grammes of sodium sulphite, also pulverised, and the funnel is filled up with 750 c.c. of distilled water. During filtering the sediment in the funnel is repeatedly stirred with a glass rod, and, after the liquid has run through, about 8 to 10 c.c. of bisulphite lye of 118° F. are added to it, by which its colour is almost entirely destroyed. Then into the same funnel, directly on the slight sediment left, 38 grammes of chemically pure soda (calcium) are poured, and the funnel is filled up with 250 c.c. of distilled water, which dissolve the last traces of the eikonogen, sodium sulphite, and soda. This second filtered liquid is then poured into the first one, and the whole well shaken. In this way the developer (in all 1,000 c.c.) is ready for use within fifteen minutes without the use of boiling water. It keeps well for a long time. If applied when freshly prepared, it works a little softer than when it has been kept for some time. A third photographer, of Hirschberg, says: "The eikonogen developer usually gives beautifully clear, though vigorous, negatives, with perfect details in the deepest shadows; indeed, such as are hardly obtainable by means of any other developer. I proceed as follows:—

I.—Sodium sulphite	200	grammes
Distilled water	3,000	c.c.
Eikonogen	50	grammes
II.—Carbonate of soda	150	grammes
Distilled water	1,000	c.c.

I mix 3 parts of solution I. with 1 part of solution II. The fixing bath consists of:—

Hypo	250	grammes
Sodium sulphite	50	,,
Water	1,000	c.c.
Concentrated sulphuric acid ...	8 to 10	,,

For developing, I take at first an old solution, and allow the plate to remain in it until the image has come out about thirty to thirty-five seconds; then the old solution is poured off, and replaced by a fresh one. The image must be rather vigorously developed, because it is reduced a little in the fixing bath.

A Remedy for Flat and Greyish Platinotypes.—Those who work the platinotype process with hot development will from time to time make the unpleasant discovery that the prints, though they appear vigorous in the fixing bath and in the washing water, become flat and grey after drying, at least if looked at by reflected light; by transmitted light they appear vigorous, as before. This is probably caused by the fact that the hot solution of oxalate of potash, and, later on, the hydrochloric acid of the fixing bath, destroy the size of the paper, and the platinotype is consequently caused to sink into the paper. In this case the following method, recommended by Hans Lenhard, of Vienna, can be used with good results:—In 1,000 c.c. of water 125 grammes of pure gelatine are melted as usual, and the solution is gradually brought up to the boiling point. After the gelatine solution has been taken from the fire, 125 grammes of pulverized alum are added, and dissolved in it with perpetual stirring. Of this solution one part is diluted with two parts of water; the mixture is poured into a flat dish, and the latter kept warm in the water bath. In this warm solution the platinotypes are immersed, and allowed to remain for some minutes. They are then put for some time in a dish with cold water, and afterwards dried between sheets of blotting-paper. It will be found that after this treatment the prints appear vigorous again by reflected light. This additional sizing of the platinotype paper has, besides, the advantage that to the positive retoucher the work is made easy, because in this state the paper does not suck up the colour so eagerly as before.

Rise in the Price of Albumen Paper.—Some weeks ago several manufacturers of albumen paper—among these the "Vereinigte Fabriken photographischer Papiere," of Dresden—sent out a circular, in which was announced that on account of innovations requiring the utmost care in the production of photographic plain paper, as well as of the albumenised paper, the price of this latter would be raised

in future ten per cent., *i.e.*, by ten marks the ream. This announcement seems to have influenced the fraternity very disagreeably, for in the last meeting of the Photographic Association of Berlin, where the affair came on for discussion, reference was made to a business report of the "Vereinigte Fabriken," according to which the financial result for the year 1889 allowed the distribution of a dividend of 19 per cent., whilst the dividend which has been paid to the shareholders for the year 1888 amounted only to 10 per cent. The question was raised, "How do the two facts harmonize, and wherefore the rise in the price of a product after a dividend last year raised by 9 per cent.?" It was recommended to professional photographers to turn themselves more and more to the gelatino-chloride papers.

Influence of Development on the Fineness of the Deposit on the Negative.—To ascertain whether the mode of developing exerts any influence on the fineness of the deposit or grain of the negative, Dr. Miethe made the following experiment: A gelatine plate was exposed at a distance of thirty-eight inches from a stearine light for ten seconds, and then cut into eight pieces, which were developed separately in eight different solutions, consisting of ferrous oxalate, pyro, and quinol developers of varied proportions. All the plates were developed until they began to turn grey when looked at from the back, and were then fixed in the acid fixing bath. After drying, the single strips were compared under the microscope. It was not observed that the fineness of the deposit was different on the various plates; on the contrary, in all the films about the same quantity of coarse grain was found intermixed with the finer grain. It is, however, just this coarse grain to which the greater sensitiveness to light must be attributed. This may be perceived by the fact that if a very briefly exposed plate is forced in development, the image will be formed almost entirely of the coarser grain. Now, since in the case of instantaneous exposures generally strong developing solutions are used, it appears that this has given rise to the error that the size of the grain depends on the composition of the developer, and that a finely-grained negative might be produced by slow development. An over-exposed plate, the coarse grain of which has been already "solarised," will therefore, however it has been developed, always show a finer grain than a briefly exposed one.

Quinol Developer with Calcium Bisulphite.—Photographic tourists will always find it a great convenience to be able to carry a large quantity of developing solution in a concentrated condition sufficient for a large number of plates. The following method is recommended by A. von Loehr. Four small bottles are filled with the following ingredients:—1. A small bottle with 100 c.c. of a concentrated solution of calcium bisulphite. 2. A small bottle with 100 c.c. of a solution of caustic soda, 1 : 10. 3. A small bottle with 25 grammes of quinol. 4. A small bottle with 10 c.c. of a solution of potassium bromide, 1 : 10. This quantity is sufficient for one hundred quarter-plates. Development is carried on in the following manner. To 100 c.c. of water, 4 c.c. of calcium bisulphite solution are added, and 1 gramme of hydroquinone is dissolved in it. On the other hand, 4 c.c. of caustic soda solution are diluted with 100 c.c. of water. The two solutions can be kept for a long time, and are to be mixed in equal parts just before development.

Platinum Toning Bath for Gelatino-Chloride Paper.—Mr. A. Stieglitz gives in the photographic Year-Book (Eder) for 1890 the following directions relating to the platinum toning bath, which has been mentioned in this journal on a former occasion. The following solution is made up:—

Solution A.

Oxalate of potash	90 grammes
Monopotassic orthophosphate ...	45 ,,
Distilled water	1,000 c.c.

Solution B.

Potassium chloroplatinite	1 gramme
Distilled water	20 c.c.

Before toning, three parts of solution A are mixed with two parts of distilled water and one part of solution B. The bath keeps for one hour, but after half an hour it should be intensified by the addition of a few cc. of solution B. The prints, which should be barely over-printed, are washed two or three times, and then placed in the bath, film side up, until they show a violet tint by transmitted light. This requires one or two minutes in summer. Then they must at once be thoroughly washed, since otherwise the whites will appear yellow after fixing.

Fixing and washing performed as usual. To impart to the prints a matt surface, they are squeezed on to ground-glass, which they will leave, after drying, with a matt surface of sepia tone. To attain black tones, a few cubic centimetres of a saturated solution of nitrate of lead should be added to the toning bath, and the prints must be printed very deeply.

WHAT PHOTOGRAPHY WILL NOT DO.

Under the above heading Captain Abney writes as follows to the *Daily Graphic* of March 24th:—

The jubilee of photography is past, and we have had recounted in public journals, almost *ad nauseam*, what photography has already done, and there has been a little prophesying of what we may expect it to do in the next fifty years, but there has been no one bold enough to tell us what it can't do. I am going to take upon myself the *rôle* of prophet, and mention one or two advances which photography cannot make, although it is popularly believed that these will become *faits accomplis* in the not too-immediate future.

Photography in Natural Colours.—The question is often asked, "When will photography in natural colours be found out?" Had the question been put, "When will photography in natural colours be commercially practicable?" or, "When will portraits in natural colours be feasible?" the answer to be given is, "Not before the centenary." Photography in natural colours has been effected, but by a process so tedious and long in operation that it can never become of the least practical value. Becquerel, Niépce de St. Victor, and others have produced photographs on silver plates in the camera approximating to the colours of objects, and the writer has produced the whole spectrum in its hues, though dim, on collodion plates, but all have been effected by means of what is known as the printing-out method, *i.e.*, by making light itself do the whole of the work on the plate, instead of merely imitating it, and obtaining the final result by means of development. Such a process, when used in the camera, is necessarily extremely slow—so slow, indeed, that only with a very bright light illuminating the object, and by an exposure sometimes extended over days, any coloured image at all can be produced. This method is, therefore, completely out of court as a practical process for obtaining portraits, and is many times worse than the Daguerreotype process in its early days, when a sitter had to endure being screwed up in a head-rest for an hour or so in bright sunshine. From a theoretical point of view, what has been done is interesting, but at present, at all events, it remains only as a scientific curiosity. To enable it to be of any practical value, exposures must be short, and this entails the after process of development. Light may so sift and shake the matter on which it falls that it aggregates or disintegrates into minute particles of such a size

that the light reflected from them shall be of that particular colour which falls upon them; but it can scarcely be conceived, though a short exposure may so change some small portion of the matter on which it falls, that a subsequent action produced by purely chemical means, as is the case in development, can continue to produce the same necessary aggregations or disintegrations of the particles. Again, with the results that have been obtained, the permanency of the images is but short, as they will bear no subsequent exposure to white light, the colours vanishing rapidly. From what has been said, it is apparent that photography in natural colours is out of the range of practicability with the present known substances which are sensitive to light, and it is unlikely that any substance will be discovered sufficiently sensitive to enable it to be carried out by a printing-out process, and we have seen how unlikely it is that any developing process can succeed.

Transmitting the Photographic Image to a Distance.—The transmission of photographic images to a distance by electrical means is also popularly believed to be within the range of practicability. The transmission of sounds by a telephone, and their reproduction by the phonograph, have seemed to the lay mind, and even to minds which are not lay, to be akin to the transmission and reproduction of photographic images. Had a little more thought, however, been expended on the subject, it would have been seen that the conditions of the two were totally different. The phonograph enables sound to be reproduced by means of lines or points marked on a sheet of foil, the depth of sound being indicated by variations in depth and breadth of the furrowed line. In a photographic image one is not dealing with anything that can be represented by a line, but only by a surface. There are two systems which may be employed to produce the effect of light and shade lying on a surface, but even then the two systems blend together by the fact that the continuous surface at one end of a telegraph wire has to be represented at the other by lines more or less closely ruled parallel to each other. Bains's system of the transmission of handwriting by telegraph may be modified to reproduce a photographic image. In this system, the paper, with the writing to be transmitted, was placed beneath a pointer connected with the telegraph wire, and made, or broke, electrical contact, according as the blank paper or the writing came beneath it. The paper at one end moved at a fixed rate, and at the other the paper was made to pass beneath a pointer at a similar rate. At the other end, and when contact was made, or broken, at the one station, similar contacts were made at the other, marking the paper when contacts were made. By passing the sheet of paper on which the writing was made in parallel lines beneath the pointer, evidently a sort of *facsimile* of the writing was produced. By a modification of this plan, a photographic print might be, in a measure, reproduced; for instance, by causing the lights and shades of a photograph to offer more or less resistance to the passage of the current. By this means, greater or less blackening of a properly prepared paper might be caused, and produce lights and shades represented by parallel lines.

A Dream and Nothing More.—The use of selenium, which alters its resistance to the passage of a current according to the intensity of light acting on its surface, has also been suggested as a sensitive surface. This sounds very nice, but unfortunately, a telegraph wire will not discriminate between the currents transmitted from one part of a surface and another. Hence, its connection with the telegraph wire for this purpose is useless. By acting somewhat on the same plan as that adopted by Bains, an image thrown on such a surface might be roughly transmitted, but it would bear but little resemblance to a proper photograph, and it is doubtful whether it would be practically, or even scientifically, of any use. Other plans based on the same principles might be suggested, but they all must fail, and until such a time arrives that one small wire will transmit an infinite number of small currents coming from different parts of a surface, and record them simultaneously on a surface at the other end of the wire, in proper order and magnitude, the idea of practical photography at a distance is a dream, and nothing more.

Light and Shade.—One more point is that photography can never be strictly truthful as regards light and shade. If the high-lights in a photograph be accurately depicted on a paper print, the shades will be found wanting in correctness. This is an inherent defect in photography, even when black-and-white have only to be reproduced. But besides this we have another inherent defect, in the difficulty in portraying colours in proper relation to one another. A photographic plate is more sensitive to some colours than it is to others; and although modern improvements have lessened this defect, and may still further minimise it, yet the want of truth in rendering shades correctly must always remain. Perpetual motion will probably be a thing of the past when truth in photography is still non-existing.

Notices of Books.

Platinum Toning. By Lyonel Clark, C.E. (*London: Hazell, Watson, and Viney*, 1890.)

This little book, which is clearly written, and contains instructions put into good form for practical purposes, consists partly of information which has already been published in the *Journal of the Camera Club*. The only thing publicly wanting in relation to Mr. Lyonel Clark's method of toning, seems to be some series of exact experiments from which some idea can be gained as to the comparative resistance of platinum-toned and gold-toned photographs to destructive chemical reagents, all other conditions being equal. At present no figures on this point are before the world.

In an appendix to the book Mr. Clark gives the following useful details from French sources, about photographic residues:—

"I advise all photographers, however humble their output, to save their residues—not that that they can expect to recover the whole 97 per cent., but they would certainly get a return of something like 80 per cent.

"From the following table, the result of careful analysis made by MM. Davanne and Girard, we can see exactly where the different losses take place:—

	Silver per cent.
Draining papers	1·028
First and second washing waters before toning	52·860
Hypo bath	32·100
Washing water of fixed proofs	4·110
Cuttings and clippings	4·570
Remaining on proofs	3·100
Loss	2·232
	100·000

"It will be at once seen that the majority of the silver is found in the preliminary washing waters and the hypo bath, being about 85 per cent. of the whole; so that if we only manage to save a fair proportion of this, we shall effect a notable economy in our nitrate of silver bill.

"A sheet of paper measuring 17¾ by 22 will take up about 37 grains of silver—say 36; and we should easily be able to recover of this about 27 grains; or, in intrinsic value, for every ten shillings' worth of silver we should get back seven-and-sixpence from our residues—on the whole, not a bad return."

After giving one of the methods of recoving silver from washing waters and clippings, Mr. Clark says:—

"The old hypo baths cannot of course be treated in the same way, since chloride of silver is soluble in this menstruum; neither can zinc very well be used to precipitate silver, as sulphide of zinc appears to be formed in the

operation. The usually adopted plan is to add liver of sulphur, and throw down the silver in the form of the sulphide, which is next roasted to free it from the sulphur, and then fused. There are two drawbacks to this method: the stench produced thereby is beastly and even injurious, and the roasting of the residue is nearly as inodorous, and if not properly carried out—that is to say, if any free sulphur is left—explosions may occur when the mass is fused. If this system of treatment be resorted to, the precipitated sulphide should be sent direct to the refiner's.

"But the simplest and perhaps best way is Davanne's method. This simply consists in immersing a plate of copper in the hypo bath, and letting it stand for about four days. Silver is gradually deposited on the copper, whilst the copper is dissolved in the liquid. From time to time, therefore, the copper plates, which are simply stood up against the side of the tub, should be brushed; the metallic silver will then gradually settle to the bottom, and when sufficient has been collected it can be filtered and washed. The dried filtrate consists of metallic silver mixed with a little copper, and can of course be at once converted into silver nitrate, contaminated with a little copper, giving it a bluish colour. This colour will cause no harm to the print, as it is soluble; but if it is very strongly present, it can be got rid of by adding gently silver oxide in the manner described in the preparation of silver nitrate."

Patent Intelligence.

Applications for Letters Patent.

3,736. J. C. Shenstone, 13, High Street, Colchester, "Horizontally Elongating Easel for Photographic Enlarging and Copying."—March 10th.

3,743. W. Scorer, North Street, Havant, Hants, "Improvements in Cameras, Slides, and Stands."—March 10th.

3,763. H. Horsey, 38, Chancery Lane, London, "Glazing Skylights and Lanterns."—March 10th.

3,765. A. P. Riley, 77, Chancery Lane, London, "Telescopic Camera Stands."—March 10th.

3,775. W. Langdon-Davies, 45, Redcliffe Square, South Kensington, "Apparatus for Developing Photographic Plates without a Dark Room."—March 10th.

3,833. F. W. Hart, 8, Kingsland Green, London, "Stands for Flash Lamps, Backgrounds, and Screens."—March 11th.

3,880. A. Watt and C. Symes, 14, Hardman Street, Liverpool, "The Production of Light for Photographic Purposes."—March 12th.

3,898. L. G. Strangman, St. Albans, Monkstown, Dublin, "Camera Stand."—March 12th.

3,958. J. W. Clarke, 37, Chancery Lane, London, "Reproducing Photographs."—March 13th.

3,968. T. W. Snagge, 14, Courtfield Gardens, London, "Facsimile Autograph 'Keys' for Portrait Groups."—March 13th.

4,035. A. T. Clarkson, 28, Bartlett's Buildings, Holborn Circus, London, "Apparatus for Facilitating the Production of the Lime Light."—March 14th.

4,036. A. T. Clarkson, 28, Bartlett's Buildings, London, "Storing Lime Points for Lime Lights."—March 14th.

4,037. A. T. Clarkson, 28, Bartlett's Buildings, London, "Pressure Gauges."—March 14th.

4,134. A. D. Loman, 186, Fleet Street, London, "Cameras."—March 17th.

4,135. A. D. Loman, 186, Fleet Street, London, "Portable Cameras."—March 17th.

4,178. G. Balagny, 323, High Holborn, London, "Flexible Phototype Plates."—March 17th.

4,269. W. W. J. Nicol and J. Lewis, Mason College, Birmingham, "Improvements in Photographic Printing."—March 19th.

4,364. Catherine E. Bissmire, 37, Chancery Lane, London, "Device for Theatrical Performances for Dissolving Living Statues from View."—March 20th.

Specifications Published.

6,385.—*April 13th*, 1889. "Stereoscopes and Cameras." Harry Ransom, 47, Friars Street, Sudbury, Suffolk, Cabinet Maker.

The inventor claims:—

1. A photographic camera adapted to take stereoscopic pictures and to be used also as a stereoscope.

2. In a combined camera and stereoscope a chamber adapted to hold a screen of ground glass or the like in either of two positions, according as the screen is being used as a focussing screen for the camera, or a light-diffusing medium or back for stereoscopic pictures.

3. In a combined camera and stereoscope having a chamber as described, providing the said chamber with a pivotted reflector for reflecting light on to the pictures when the apparatus is used as a stereoscope, and for closing the said chamber when the apparatus is used as a camera.

4. In a combined camera and stereoscope, a screen having springs which serve to maintain the said screen in position, and, when the apparatus is being used as a stereoscope, as a holder for the pictures.

5. A combined camera and stereoscope, the lens carrying sockets of which are adjustable relatively to each other.

6. The combination with the apparatus hereinbefore described of the dark slide or plate-holder, having a central slide or partition adapted to press against the backs of the sensitised plates and hold them firmly in position in the slide, the plates being introduced into and removed from the slide at one end.

6,585. *17th April*, 1889.—"A New Use for Gelatine." Richard Henry Brunton, 21, Wellington Street, Strand, London, Civil Engineer.

The object of this invention is to manufacture tablets suitable for advertising purposes, whereby the tablets are produced in relief.

The inventor takes a model of the tablet he wishes to reproduce, such model having whatever undercut or relief may be required in the tablet; from this model he obtains a mould in gelatine; he then takes fine plaster of Paris reduced to a liquid state, to which he adds a small quantity of alum, which tends to produce a hardness of surface in the cast. Liquid plaster thus prepared is then inserted into the various interstices in the mould (which is conveniently effected by a brush), and subsequently (with the fingers) tow or other fibrous material as near the surface of the mould as may be found practicable; layers of canvas or equivalent material are then placed over the whole surface and a framework of wood. Liquid plaster is now washed over the surface, and when it sets all the materials become incorporated, and the tablet is removed from the mould in one piece, and then painted and decorated to suit requirements, as fancy or taste may dictate.

6,686.—*April 18th*, 1889. "Photographic Cameras and Lenses." Thomas Rudolph Dallmeyer, 25, Newman Street, Oxford Street, London, Optician, and Francis Beauchamp, Hope College, Whalebone Lane, Chadwell Heath, Essex, Engineer.

Our invention relates to photographic cameras and lenses.

Heretofore in applying a lens to a camera for which it has not been specially fitted, it has frequently happened that the diaphragm slot does not occupy its proper position, owing to the fact that the lens, when screwed up, has not been turned quite far enough, or has been turned too far, and in order to remedy this defect it has been necessary to alter the lens mount to adapt it for the camera. The same difficulty has also existed when applying a shutter to a lens.

The object of our invention is to provide means whereby a lens or shutter can always be caused to assume its proper position without the necessity for special adjustment, and to this end it comprises the improvements hereinafter described.

According to our invention the flange on the camera into which the lens is screwed is provided with an adjustable ring or collar, having a slight longitudinal movement upon the said

flange, so that it can be adjusted to the proper position to cause the diaphragm slot of the lens to occupy its proper position when screwed up.

In practice we prefer to adjust the ring or collar upon the exterior of the flange by means of screw threads, but it may be provided with a series of inclined teeth, or arranged in any other suitable manner.

In cases where a shutter is to be screwed into the front cell of a lens, the latter can be provided with a ring or collar of similar construction.

The inventors claim :—

1. The combination with a photographic camera or lens of an adjustable ring.

2. A photographic camera, the lens carrying flange of which is provided with an adjustable ring.

3. A lens having an adjustable ring or rings thereon substantially as described.

6,999.—*April 26th*, 1889. "Magic Lanterns." Charles Gray, 11, Crooked Lane, King William Street, and Henry Kemp, 7 and 8, Thavies Inn, both in the city of London, Opticians.

Our invention relates to magic lanterns for producing dissolving view effects. In dissolving view lanterns as heretofore constructed, it has been usual to provide each set of lenses with independent illuminating apparatus, which arrangement, when oil lamps are used for effecting the illumination, renders it necessary to place the lenses side by side.

According to our invention, we employ one set of illuminating apparatus in connection with two or more sets of lenses, whereby we are enabled to place the said lenses one over the other, and thus produce an oil illuminated lantern which is more compact than those heretofore constructed.

In carrying out our invention, we advantageously place the lamp or other illuminating apparatus upon a movable platform or stage, by means of which the said illuminating apparatus can be placed in connection with either set of lenses. The said platform is advantageously moved by means of a rack and pinion, but any other suitable mechanism may be employed for the purpose.

In some cases we use only a single condenser, which is placed on the platform with the illuminating apparatus, and is moved therewith so as to operate in conjunction with either set of magnifying lenses.

Although we prefer to arrange our improvements in a lantern in which the several sets of lenses are arranged in a vertical line, it is to be understood that our said improvements are equally applicable to lanterns the lenses of which are placed in a horizontal line.

The inventors claim :—

1. A magic lantern having two or more lenses, and a single lamp or illuminating apparatus, the said illuminating apparatus being mounted upon a platform adapted to be moved so as to bring it opposite to either lens.

2. In a magic lantern, the illuminating apparatus of which is adapted to be moved to bring it opposite to either lens, mounting the condenser so that it will move with the said illuminating apparatus.

3. In a magic lantern, mounting the lamp or other illuminating apparatus upon a platform adapted to be moved vertically in guides by means of a rack and pinion, so that the said illuminating apparatus can be placed opposite either lens.

7,905. *May 11th*, 1889.—"Measuring Distances of Objects." Charles Francis Martin, of the 2nd Battalion The Highland Light Infantry, Depôt Hamilton, Lanark, Lieutenant.

My invention relates to means of measuring distances of objects, as for range finding, topographical surveying, and such like purposes. By means of a suitable mirror or prism, I determine a station whence the distant object appears at or about right angles to a second object. I then pace or measure a base in the direction of the second object until I come to another station whence some other distant third object is at or about right angles to the second object. At this last station I hold a double sight of known width at such a distance from the eye, that I see both the first and the third objects coinciding respectively with the two slits or points of the double sight ; then, by a simple proportion, I compute the distance of the first object from the first station, for, as the known width of the two sights is to the ascertained distance of the sight from the eye, so is the paced or measured base to the distance required. The prism or mirror, the double sight, and a tape or other measure for ascertaining the distance of the sight from the eye, may all be accommodated in compact form for the pocket.

173. *4th January*, 1890.—"Holding and Exhibiting Photographs." Frederick Kitto, 3, Lower Union Street, Torquay, Devonshire, photographer.

My invention relates to improvements in apparatus for holding and exhibiting photographs and other like views, and is intended for the purpose of using up photographers' waste plates by mounting photographs thereon by optical contact or otherwise.

The invention consists of a frame to receive a photograph, view, or any picture, with the back portion glued to the frame to fix the aforesaid photograph or view in its desired position.

The frame is constructed of leather, cloth, linen, wood, metal, or of any other suitable material, with any degree of elaboration on the frame.

The object of my invention is to fix the photograph or view in the frame, or to fix a view or picture on the glass, after or before the glass is fixed in the aforesaid frame.

The inventor claims :—

1. The combination of the apparatus for holding and exhibiting photographs and other like views, and for using up photographers' waste plates, by mounting photographs thereon, or by optical contact or otherwise, as described and according to drawings.

2. The frame to be of any shape or size, and to be constructed of any suitable material.

616. *Jan. 13th*, 1890. (Communicated from abroad by Georgina Newton, of No. 6, Avenue du Bois de Boulogne, Paris, France, Gentlewoman.)—"Improved Pocket Lamp." Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, London, Consulting Engineer.

This invention relates to an improved construction of apparatus in which are combined in a compact form a lamp and means for automatically igniting the same. The cylindrical lamp vessel is filled with a suitable porous material, such as cotton wool, which is saturated from time to time with paraffin on unscrewing the bottom, and the said lamp vessel is so arranged that on turning the bottom cap in the contrary direction to that in which it unscrews, it will cause the lamp vessel to revolve in the casing. At one side of the latter a flat channel is formed on the outside, and through the open lower end of the passage is inserted a strip of cardboard or stiff paper, on one face of which are deposited small quantities or dots of combustible compound, such as is used for matches or fusees, situated at equal distances apart. On the top of the lamp is fixed a piece of wire or strip of metal which, at each rotation of the lamp vessel, has its projecting end brought sharply against one of the dots of material, to thus cause its ignition, whereupon the resulting flame ignites the wick of the lamp.

611.—*January 13th*, 1890. "Magic Lanterns and Apparatus relating thereto." William Charles Hughes, Brewster House, 82, Mortimer Road, Kingsland, Middlesex, Manufacturing Optician.

This invention can be adequately explained only by the aid of diagrams.

765.—*January 15th*, 1890. "Plate-Changing Apparatus." Newnham Browne, 73, Cheapside, London, Fellow of the Institute of Patent Agents. Communicated from abroad by Friedrich Auguste Fichtner, of Elisenstrasse, 6, Dresden, Altstadt, Saxony, Cabinet Maker.

The invention relates to an arrangement or apparatus for application to photographic cameras carrying several plates simultaneously (such, for instance, as are known as detective cameras) enabling an exposed plate to be rapidly changed for a fresh or unexposed plate, so that a fresh exposure may be made with a loss of a few seconds only.

Correspondence.

A PHOTOGRAPHIC SCHOLARSHIP.

Sir,—May I trespass again on your space to make an alternative proposal for the disposal of the above. At the Camera Club Conference on Friday it was proposed that an annual exhibition of photographs should be held, on the lines of the Royal Academy or Paris Salon, where the hanging of a picture would be its own reward. The only difficulty in the way was want of funds. Now, if such a scheme is carried out, I may say that the Britannia Works Company will be most happy to place their gift at the disposal of the committee that might be formed for the purpose. If others who have hitherto limited their efforts to raise photography to a higher status to mere talk, should follow the admirable practical example, there is no reason why both the suggestions put forward should not be carried out. Then we may see our art science rank with other branches of learning which have endowments for the furtherance of their study, and adequate rewards for those who excel therein. John Howson.

Ilford, 22nd March, 1890.

CHALLENGE CUP COMPETITION AT THE CRYSTAL PALACE.

Sir,—Would you kindly insert the enclosed in your next issue, and oblige James Brown, Edgar G. Lee,

Hon. Secs. Newcastle-on-Tyne and Northern Counties Photographic Association.

[Copy of a letter sent to Messrs. G. B. Wollaston and J. F. Peasgood, Photographic Exhibition, Crystal Palace, London.]

Gentlemen,—Confirming my telegram of the 19th inst., I am instructed by our exhibitors, whose names are appended at foot, to formally protest against the award in the Challenge Cup Competition, on the ground that, from authoritative information in our possession, a portion only of our exhibits was brought under the notice of the judges.

A large portion of our pictures having been excluded from the competition, as we *know* to be the case, we hereby demand an explanation, and unless that explanation is satisfactory, we insist upon the entire Cup Competion being re-judged.

A copy of this letter is being sent to each of the photographic papers. Edgar G. Lee, *Hon. Sec.*

Mosley Street Café, Newcastle-on-Tyne, 21st March, 1890.

Exhibitors' names :—Auty & Ruddock, T. Galloway, J. P. Gibson, J. E. Goold, Edgar G. Lee, W. Parry, J. Pike, H. R. Procter, H. G. Ridgway, Lyd. Sawyer.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

Sir,—In connection with our forthcoming Photographic Exhibition, kindly permit us, through your columns, to announce to intending exhibitors that we have, in their interest, decided to extend the date for sending in application forms from April 1st to April 7th. Pictures must, as previously advertised, be in our hands by the 10th prox.

James Brown, Edgar G. Lee } *Hon. Secs.*

The Photographic Society.—The following are the present officers of the Photographic Society. *President*—James Glaisher, F.R.S., F.R.A.S. ; *Vice-Presidents*—Capt. W. de W. Abney, C.B., R.E., D.C.L., F.R.S., T. Sebastian Davis, F.C.S., H. P. Robinson, John Spiller, F.C.S., F.I.C. ; *Treasurer*—Walter S. Bird, 74, New Oxford Street, W.C. ; *Members of Council*—G. L. Addenbrooke, W. Bedford, Valentine Blanchard, Lyonel Clark, Francis Cobb, Alexander Cowan, Thomas R. Dallmeyer, Major L. Darwin, R.E., G. Davison, W. E. Debenham, W. England, J. Gale, H. Chapman Jones, F.I.C., F.C.S., Sir George Prescott, Bt., Sir David L. Salomons, Bt., J. W. Swan, M.A., F.C.S., J. Traill Taylor, Leon Warnerke, H. Trueman Wood, M.A. ; *Hon. Secretary*—Capt. A. M. Mantell, R.E., 8, Mansion Row, Old Brompton, Chatham ; *Assistant Secretary*—Edwin Cocking, 52, Pall Mall East, S.W.

Proceedings of Societies.

Photographic Society of Great Britain.

The monthly technical of this Society was held on Tuesday evening last, the 25th inst. The chair was occupied by Mr Arnold Spiller, F.C.S.

The Assistant-Secretary, Mr E. Cocking, having noticed that the subject of the fading of silver prints was under discussion, and having an illustrative specimen in his possession, had notified to members that the subject would be presented, and had brought the specimen with him. It had been taken only four years since, and had been printed upon commercial ready sensitised paper, and toned with the acetate bath. The print had faded very badly ; whereas another print made thirty-one years ago, and toned with the mixed hypo and gold bath—the print having been mounted in a similar frame to that containing the faded one, and hung on the same wall—was still in good condition.

The Chairman believed that there were some makes of cheap albumen paper which were very conducive to fading. About five years ago he was using a cheap kind of albumen paper, and had since found that all the prints that he could trace as having been printed on that sample had faded considerably. Some of the prints even showed distinct signs of fading within two months of their being executed. The paper had a strong smell. Unmounted prints of that lot had not faded so much as the mounted ones, but the former had the advantage of having been kept in a drier place.

Mr. Atkinson mentioned that in a part of Spain where the atmosphere was generally very moist, prints had been found to fade very rapidly.

The Chairman asked whether it was known, with any certainty, that encaustic paste has a preservative effect? He had a particular collection of photographs, all of which had faded except three. Of these three, one was a carbon print, and the two others had been treated with encaustic paste.

Mr. W. Bedford said that encaustic paste was not a complete protection. He had in his possession three prints that had been treated in that way, one of them by Adam Salomon, and they all showed signs of fading.

Mr. A. Mackie said that Mr. A. L. Henderson had used a sort of varnish consisting of a weak solution of gum dammar in benzole, and had found that prints so protected and exposed side by side with others not so treated had stood much better. He would enquire whether there were not two kinds of fading, one kind showing itself by partial disappearance of the image, and the other by a yellowing of the lights.

The Chairman said that the yellowing of the lights was due to a silver compound not dissolved out in the fixing bath. The presence of this compound could be detected in a fresh print by applying a dilute solution of sulphide of ammonium.

Mr. Bedford enquired whether the addition of carbonate of ammonia to the fixing bath, which had been proposed as a remedy for the kind of imperfect fixation referred to, had proved to be a complete success?

Mr. John Spiller said that ammonia dissolved nearly, but not quite, the whole of the silver compounds. The only substance which he had found to completely remove the silver was cyanide of potassium ; this must be used in a very dilute state —half a grain to the ounce was sufficient.

Mr. T. Sebastian Davis said that at the present time a great many negatives were made very thin. That was a condition which was conducive to fading of prints made from them, as a good vigorous image could not be obtained. Printing in sunlight also gave a much more permanent print than could be got by printing in the shade. The use of sodium acetate in the toning bath resulted from some experiments made by Mr. Hannaford and himself. Too much soda had been added when making up the alkaline bath then in use, and Mr. Hannaford put in some acetic acid to counteract the alkalinity. He then observed a characteristic effect upon the tone of the prints, and afterwards acetate of soda was used direct.

Mr. Mackie enquired whether there was any characteristic difference of tone obtainable with the different salts added to

neutralise the gold. He could not discover any difference when all were stopped at the same stage. He had used carbonate, borate, tungstate, and acetate.

Mr. Davis considered that borax gave a blue tone more readily than acetate, but there was a great differance in the keeping power. A borax bath should be used directly, whereas an acetate bath was better for being kept for twenty-four hours.

Mr. W. E. Debenham said that he found it stated in books and periodicals that the active condition of gold in a toning bath lasted until the metal was precipitated. His own observations, however, led him to the conclusion that the gold passed by keeping into a state when it would tone, if at all, only with extreme difficulty, and that whilst still in solution. On the other hand, even a dilute solution of gold might tone actively, although partial precipitation had taken place. This was shown by the alkaline process with carbonate of soda and citric acid, recommended by Hardwich at about the end of the year 1858. It was directed to heat the solution until a bluish colouration showed the commencement of precipitation, and the bath on cooling down was then found to be in vigorous toning condition.

The Chairman said that toning baths appeared to get soonest into condition as the acid of the added salt was weak. Hypochlorous and carbonic acids were amongst the weakest acids known, and baths made with carbonate of soda, or hypochlorite of lime, were the soonest ready for use.

Mr. John Spiller then showed a collection of about forty photographs which had been made from twenty-five to thirty-one years ago by direction of the War Office; none of them showed any fading. They were not a picked lot, but the whole of the set that he possessed. The practice in making these prints was to use purchased albumen paper, and to float it on a fifty-grain bath. The toning was done with bicarbonate of soda, and the fixing in fresh hypo. Washing was effected by means of a trough in which the prints were swirled round by a stream of water, and with an intermittent syphon discharge they were drained occasionally during the course of the washing. A false bottom of zinc pierced with holes prevented the prints from sticking to the vessel when it was emptied of water. After a time the prints were taken out, and left to soak in dishes during the night; the prints after drying, were mounted with warm glue beaten into a froth like shaving paste. The mounts used had been, according to the date, of four different colours, and were not all from the same manufactory.

Mr. Bedford thought that thorough fixing was of more importance than long washing. He had two hypo baths in use; the first contained a solution of one part of the salt to five of water. The prints were removed from this bath to one containing one part hypo to ten of water. Both baths contained liquid ammonia in the proportion of eight minims to the pint. It had been said that citric acid in the paper hindered the toning. In his experience, the effect was just the contrary. In reply to questions as to the preparation of the paper, he stated that he first floated upon a fifty-grain bath—which must be quite neutral—and then, after removing the surface liquid by drawing the paper over a glass rod, it was floated for half a minute upon a second bath containing thirty grains of nitrate of silver, and a like quantity of citric acid, to the ounce. Paper thus prepared would keep good for months. The second bath did not require to be replenished with silver, but only with citric acid, which was added in the proportion of five grains for every sheet of paper that had been floated.

Mr. England said that a difficulty had been found in keeping celluloid films, except those of small size, flat in the dark slides. He had found that if a slight curve were given to the film it would maintain its position, and he had, therefore, had strips put in the dark slides, which made the film slightly concave towards the lens. The ends of the film with a whole plate were about one-eighth of an inch in advance of the centre. This concavity also was useful in bringing the ends more in focus at the same time as the centre of the field. He had particularly noticed this when using a rapid rectilinear lens.

Mr. Debenham said that there was a certain amount of distortion when a curved plate was used with a non-distorting lens. In ordinary cases it might not be sufficient to show, but in architectural subjects, when filling the plate to the margin, it might do so. With an ordinary single lens the distortion would be increased, but with an orthoscopic lens the distortions might be made to nearly correct each other.

It was announced that at the next technical meeting, which will take place on the fifth Tuesday in April, the subject of Celluloid Films will be discussed. Mr. T. S. Davis also promised to make some experiments on the lines indicated by the discussion of this evening, and bring up the results on that occasion.

London and Provincial Photographic Association.

March 20th.—Professor E. Stebbing, of Paris, in the chair.

The Circular issued by the Camera Club Conference, with reference to the Regulations for Photographic Exhibitions, was taken into consideration. The members were of opinion that it was little use attempting to frame regulations, as each committee managing an exhibition would make its own conditions, leaving it to the public to accept them, or refrain from exhibiting, as the case might be. About many of the questions asked, it was impossible to give a decision, as so much depended upon circumstances. With regard, however, to some of them, they thought that (1) Exhibition authorities *should* decline prizes placed at their disposal for advertising purposes; (2) That awards should *not* be of equal value; (3) That there should be a class for *un*-touched pictures; (4) That it was not desirable to stipulate that each picture should be in a separate frame; (5) That all pictures should be judged on their merits, and that there should be no distinction made between amateur and professional exhibitors.

The Chairman exhibited some very good collotype prints by Balagny, of Paris. The negative of one of the subjects was by himself, and such was the rapidity of the process, that within forty-five minutes of placing it in M. Balagny's hands twelve collotype proofs were produced. The Chairman also passed round some photochromic prints by the Zurich Photochrome Co. They were printed from stone, the bitumen process being employed.

The "International Photographic Union" was referred to by the Chairman, who said that any members of a photographic society joining it would be welcomed by their continental brethen. Ladies were eligible, and there was no subscription.

Replying to a question as to the popularity of eikonogen in Paris, the Chairman said that it was not in popular favour. Hydrokinone was the favourite, and was very economical; he had developed about nine hundred whole-plate negatives at a cost of about twelve shillings.

A discussion on orthochromatic photography, and the ease with which plates could be prepared, brought the meeting to a close.

Liverpool Amateur Photographic Association.

On the evening of Thursday, 20th March, the members and friends, to the extent of four hundred and thirty, held their first "Ladies' Social." Although the Association has been in existence since 1863, the experiment of a ladies' evening had not been before attempted. The large hall—the "Eberle"—was occupied to its utmost capacity. The first hour was devoted to a vocal and instrumental concert, at which some of the leading local amateurs kindly assisted. This portion of the entertainment was under the guidance of two musical members, Messrs. Arnold J. Cleaver and F. K. Glazebrook, who are able photographic workers; they both secured medals at the Society's last Annual Members' Competition.

The entertainment concluded with the President's "Lecture on Norway." This included 130 views taken last June by the speaker, Mr. Paul Lange. The descriptive matter was entertaining and instructive. Many of the scenes depicted were hand-camera exposures, giving the daily life of the people of Norway, and there were general views of mountain, glacier, and river scenery. The pictures were shown to advantage on a 16-feet opaque screen, with Messrs. Archer and Sons' long-focus 12-inch lenses.

THE LANTERN SOCIETY.

A REPRESENTATIVE meeting was held last week at St. James's Hall, when a set of rules was adopted. The programme of the Society's work is to embrace, amongst other things, the interchange or provision for an interchange of slides between members in town and country, concessions in the shape of special terms from makers and dealers in slides, lanterns, and apparatus, together with an interchange between various clubs of exhibitions.

The following is the list of the council as far as appointed :—*Chairman*—the Hon. Slingsby Bethell ; *Vice-Chairman*—Mr. T. H. Holding ; *Secretary and Treasurer*—Lieutenant C. E. Gladstone, R.N., Northwood Hall, Rickmansworth, together with Messrs. G. S. B. Cresswell, E. Hall, N. Mackin, Maw, A. N. Shepperd, and E. R. Shipton.

The annual subscription is a guinea, the entrance fee a guinea, and for country members it is 10s., and 10s. ; but all joining the Society before October 1st are admitted without entrance fee, and all subscriptions will free members up to October 1891.

PHOTOGRAPHIC SOCIETY OF IRELAND.

AT a meeting of the Photographic Society of Ireland, held on the 24th inst., the chair was occupied by Dr. J. ALFRED SCOTT, Vice-President ; and Mr. J. Joly, M.A., delivered a lecture entitled "Among the Alps with a Camera." The photographs were taken *en tour*, commencing at Brunnen, on Lake Lucerne. The places, heights, and valleys of interest were numerous, and the chief of them were exhibited either as reductions or contact lantern slides, and comprised about seventy-two views, and included well-known mountains, glaciers, and passes. The exposures were varied from one-eighth of a second, with a small stop, to whatever the light indicated for the foreground. In this latter particular assistance had been gained by resorting to the standard tables now published by various authors. The camera, 7½ by 5, was supplied with a Dallmeyer R R Landscape Lens. The plates used were Wratten and Wainwright's. With regard to development, pyro was first tried, but afterwards discarded, and hydrokinone entirely used.

To get the best results Mr. Joly developed by the "partial" method, recommended by Dr. P. H. Emerson and Capt. Abney. The sky and bright lights, as from snow, were first brought up, and development of them stopped by plunging the plate in water. The development of the foreground is then proceeded with by dipping and brushing on a stronger developer, *i.e.*, a weak developer is used in the first part of the process ; when detail is obtained the development is equalised by putting the plate backinto the developer for a mouent ; washing and fixing complete the process.

The details were good, while the snow, glaciers, and skies were excellent. Instances of passing mists, or uonntain tops peeping through clouds, showed that the lecturer and his fellow-traveller (Mr. Dixou) had displayed taste in selecting their views, and judgment as to exposnre and development.

PHOTOGRAPHIC CLUB.—The subject for consideration on April 2nd will be "Standard Solutions, and the Expression of Photographic Formulæ." Bank Holiday outing at Godalming.

BECQUEREL is sometimes credited by his friends to be the first who photographed the solar spectrum. The spectrnm was first photographed by Ritter, and abont the same time, quite independently, by Wollaston.

M. H., Dublin.—Soune parts of your MS. just received are illegible, and soune incomplete.

M. GOUPIL, Havre.—We hope to publish your interesting communication next week.

THE publication of some notices of books, apparatus, and other matters is postponed until our next issue.

THE PHOTOGRAPHIC NEWS will be published on Thursday next, on account of the Easter holidays. All communications should therefore reach the office not later than Wednesday morning.

Answers to Correspondents.

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

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

UBIQUE (Co. Wexford).—*Photographic Trebles and Doubles.* "How to take a treble image of one and the same person playing at Chess?" is your question. All depends upon the position occupied by the players. If you mean to have three figures—say, right and left profile and front face (of the same individual) seated around the table, and supposed to be playing a two to one game—then we should be inclined to take the chess board and central figure by one exposnre, a side player against the same backgrounnd by a second exposure, and reverse this plate for the third figure. Is this an answer? For, to reply literally, a Victoria camera with three lenses would give at once "a treble image of one and the same person." But this, surely, is *not* what you mean? There is no difficulty in taking "doubles ;" such, for instance, as "Rejlander the Artist introdncing his friend Rejlander the Volunteer," or "The Painter and his Critic," now in the Crystal Palace Exhibition (screen 20) ; but the addition of a third figure, at what is ordinarily the point of junction, is not so easy of accomplishment.

W. S.—*Hydrometer Test for Silver Baths.* Under ordinary circumstances it *is* sufficiently reliable both for the printing and collodion baths. Take the specific gravity of the newly-made solutions, and maintain this uniformly by the addition of fresh nitrate of silver. This is not quite exact, for the accnmulation of alkaline nitrate in the solution is not taken account of, although it must slightly affect the hydrometer indications ; but for practical purposes this interference may be disregarded.

L. T. E.—*Chromates versus Bichromates in Gelatine.*—We are not aware of any experiments showing the comparative sensitiveness of such preparations ; but Mr. W. T. Wilkinson asserted last week, at the Camera Club, that it *was* desirable to add ammonia to the bichromated gelatine, which would of course determine the formation of a neutral chromate in the film, and that he, in practice, fonnd this to be a decided improvement.

M. F.—*A Small Studio.* Further particulars go to you by post, together with a letter of introduction.

J. D.—*Incandescent Lamp.* Received your letter, and we will bear it in nuind. No news since our interview.

INVERNESS.—We are returning yonr photographs with a private letter.

J. E. M.—*Photography in Natural Colours.* We think the case has been well stated by Captain Abney ; and, until further evidence is forthcoming, we must suspend our judgment. One can hardly say that it has been confirmed by Dr. Eder.

M. P.—*Blisters on Albumenized Paper.* Have you tried to overcome this difficulty by adding a small quantity of methylated spirit to the silver bath? This might tend to diminish the solubility of the albumen. Use about one ounce of spirit per pint of silver nitrate solution, which had better be mixed of full strength to compensate for such dilution.

E. G. (Barnet).—*Isochromatic Plates.* The evideuce is open to inspection at the Crystal Palace Photographic Exhibition, Block G ; but bear in mind that to-morrow will be the last day.

L. A. (Devonport).—*Collodio-Chloride Prints : Want of Density.* This method, like the old Wöthlytype, was always supposed to be best fitted for the production of delicate prints, and does not lend itself so well to the printing of dense negatives.

RESIDUES.—*Reduction of Silver by Iron.* Zinc is a much better reducing agent, and the difference of cost is not worth consideration. Iron only very slowly reduces the nitrate of silver, whereas zinc does so immediately, being a more highly electro-positive metal.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1648.—*April 4, 1890.*

CONTENTS.

"GIPHANTIA" INVESTIGATED.

SOME weeks ago, a communication was made to the Camera Club about photography having been foretold in an old book called "Giphantia," published in 1761. Long ago, in the old wet-plate days, this matter attracted the attention of the photographic press, and one writer, whose utterances we have recently tried to rediscover, but failed, sent to one of the photographic journals some strong reasons or statements questioning the antiquity of "Giphantia," or the extract therefrom; therefore our reports of the statements made at the Camera Club in relation to the book were cautiously worded.

As the exceedingly curious matter deserved investigation, we have since, by examination, found that the British Museum Library contains three editions of the book, all, so far as antique appearances go, bearing external evidence of being old and genuine. The first of these, entitled "Giphantie," is in French, and bears the date of 1760; it is anonymous, and purports to be published at "Babylon." The second is also in French, is dated 1761, and purports to be published at *La Haye* by Daniel Monnier. The third is an English translation, with the following words on the title page:—"Giphantia: or a view of what has passed, what is now passing, and, during the present century, what will pass in the world. Translated from the original French, with explanatory notes, London. Printed for Robert Horsfield, in Ludgate Street, 1761." The anonymous translator dedicates this edition to "The Hon. Miss Ross." On the leaf opposite the title page is written:—"This book belongs to Twickenham, and taken from thence June ye 1st, '99.—F. Howe." Some members of the Camera Club state that another edition of the work was published at Cherbourg.

The authorities of the British Museum ascribe in their catalogue the authorship of the book to Tiphaigne de la Roche, and state that the two French editions, which are first mentioned in the preceding paragraph, were in reality published in Paris. Barbier's *Dictionnaire des Ouvrages Anonymes*, vol. ii., page 544, published in Paris in 1874, ascribes the authorship of "Giphantie" to Ch. Fr. Tiphaigne de la Roche, and gives the date of the book as 1760, so fully recognises its genuineness; and it is probable that, on the authority of Barbier's book, the name of Tiphaigne de la Roche is applied to the work in the British Museum catalogue of printed books. Vol. III. of the *Bibliotheca Britanniea*, published in Edinburgh in 1824, catalogues the English edition of "Giphantia," so that the work was certainly in existence before the advent of the Daguerreotype, collodion, and gelatine processes; consequently the work may be regarded as not of recent date. Under these circumstances, we now quote in full the remarkable passages contained in the book:—

I saw, out of a window, a sea which seemed to me to be about a quarter of a mile distant. The air, full of clouds, transmitted only that pale light which forebodes a storm: the raging sea ran mountains high, and the shore was whitened with the foam of the billows which broke on the beach.

By what miracle—said I to myself—has the air, serene a moment ago, been so suddenly obscured? By what miracle do I see the ocean in the centre of Africa? Upon saying these words, I hastily ran to convince my eyes of so improbable a thing. But in trying to put my head out of the window, I knocked it against something that felt like a wall. Stunned with the blow, and still more, with so many mysteries, I drew back a few paces.

"Thy hurry," said the Prefect, "occasions thy mistake. That window, that vast horizon, those thick clouds, that raging sea, are all but a picture."

From one astonishment I fell into another; I drew near with fresh haste; my eyes were still deceived, and my hand could hardly convince me that a picture should have caused such an illusion.

"The elementary spirits," continued the Prefect, "are not so able painters as naturalists; thou shalt judge by their way of working. Thou knowest that the rays of light reflected from different bodies make a picture and paint

the bodies upon all polished surfaces, on the retina of the eye, for instance, on water, on glass. The elementary spirits have studied to fix these transient images; they have composed a most subtile matter, very viscous, and proper to harden and dry, by the help of which a picture is made in the twinkle of an eye. They do over with this matter a piece of canvas, and hold it before the objects they have a mind to paint. The first effect of the canvas is that of a mirrour; there are seen upon it all the bodies far and near, whose image the light can transmit. But what the glass cannot do, the canvas, by means of the viscous matter, retains the images. The mirrour shows the objects exactly, but keeps none; our canvases show them with the same exactness, and retain them all. This impression of the images is made the first instant they are received on the canvas, which is immediately carried away into some dark place. An hour after, the subtile matter dries, and you have a picture so much the more valuable, as it cannot be imitated by art, nor damaged by time. We take, in their purest source, in the luminous bodies, the colours which painters extract from different materials, and which time never fails to alter. The justness of the design, the truth of the expression, the gradation of the shades, the stronger or weaker strokes, the rules of perspective—all these we leave to nature, who, with a sure and never-erring hand, draws upon our canvases images which deceive the eye, and make reason to doubt whether what are called real objects are not phantoms which impose upon the sight, the hearing, the feeling, and all the senses at once."

The Prefect then entered into some physical discussions, first, on the nature of the glutinous substance which intercepted and retained the rays; secondly, upon the difficulties of preparing and using it; thirdly, upon the struggle between the rays of light and the dried substance; three problems which I propose to the naturalists of our days, and leave to their sagacity.

Meanwhile, I could not take off my eyes from the picture. A sensible spectator, who from the shore beholds a tempestuous sea, feels not more lively impressions; such images are equivalent to the things themselves.

The Prefect interrupted my extasy. "I keep you too long," says he, "upon this storm, by which the elementary spirits designed to represent allegorically the troublesome state of this world, and mankind's stormy passage through the same; turn thy eyes and behold what will feed thy curiosity and increase thy admiration."

Charles François Tiphaigne de la Roche was born at Montebourg in 1729, and died on the 12th August, 1774. He was a doctor of medicine and a literary man, and chiefly made his mark in the world in the latter capacity. He took his degrees in the University of Caen. His works are little known, and but few of them preserved in this country; most of them are of an idealistic nature. Giphantia is the name of an island which the author supposes to have been given to supernatural beings one day before Paradise was closed on the ejection of Adam. He wrote a few scientific works: one of them, entitled "Physical Observations on Agriculture, Plants, and Minerals," was published in 1765.

Why does not the Photographic Convention, which meets at Chester this year, arrange for an excursion to the top of Snowdon? It may be years before it is within the same moderate distance thereof.

PHOTOGRAPHY IN SWEDEN.

The *Fotografisk Tidskrift*, or Photographic News, published at Stockholm under the management of Albin Roosval, presents its readers in last month's issue with a pictorial supplement of no mean interest. In the course of every year six illustrations at the least accompany this publication. The present picture, says the paper, will show what we are able to accomplish by aid of the newest and possibly most important of the means of photographic printing. The picture is a *phototype* taken *direct* from a negative after nature by a new method elaborated by Axel Lagrelius, with the assistance of a lithographic institution, representing a country scene with figures. A man is shown reclining under a tree by a river-side watching the approach of a boat containing a man and woman to the shore. In the foreground are reeds, sedges, and other water-plants. On the spectator's right is a pier or boat-house. The whole presentment is soft and delicate, and the process is said to be quick and cheap.

At a meeting of the Society at Stockholm on the 19th February, under the presidency of H. Gilden, the following were elected members:—John Höjer, Max Sievert, Henrik Rosen, C. G. Engström, C. Johansson, M. E. Bäckström, B. W. Lundin, A. F. Höglund, A. Lindstedt, H. G. Öhrling, K. Salin, O. Lindberg, Feyehting, Victor Berg, E. Lundström, C. Akrell, F. Almgren, Professors Montan and Retzius, C. G. Rude, a photographer of Christiana, and the Court photographer, M. Hansen.

Professor Hasselberg gave a lecture at this meeting on some experiments of the elder Draper, chiefly derived from "Draper's Scientific Memoirs." The "Scientific Memoirs" or experimental contributions to a knowledge of radiant energy, written by John William Draper, M.D., LL.D., the celebrated President of this Faculty of Science in the University of New York, were published in England in octavo in 1878, and are sufficiently well-known.

The most interesting part of this work, which engaged the attention of Professor Hasselberg, is perhaps "on the analogy between the phenomena of the chemical rays and those of radiant heat," extracted from the *Philosophical Magazine* of September, 1848.

The editor, Albin Roosval, exhibited during the meeting a collection of photographs, executed and presented to the Society by Christensen and Sörensen, of Silkeborg, in Denmark. These photographs were copied on aristo paper manufactured by that firm, and some specimens of this paper were submitted to the members of the Society for experiments.

Numa Petersen showed a flash-lamp of French construction. This apparatus, which has the form of an ordinary note-book, gives a strong light, sufficient to illuminate a small group in a room, and will supply twenty flashes uninterruptedly, one after the other, in the space of one minute. It contains a benzine lamp, lucifer matches, and magnesium powder, and is ready for use on any occasion. The cost for every flash is a mere trifle. The whole apparatus may be purchased for 10 kronor, or about 11s. 1½d.

The rest of the number is made up of the usual answers to correspondents, reviews of works treating on photography, an article on composite photography after J. T. Stoddard, and an announcement of an amateur photographic exhibition in Buda-Pesth; this exhibition, commencing on the 15th of April, will remain open till the conclusion of May.

PHOTOGRAPHIC PRINTING, OUTDOOR AND IN.

BY C. BRANGWIN BARNES.

It has often been a matter of considerable surprise to me that so many photographers should still conduct their printing in the open air. From the earliest days of photography it has been a recognised fact that the operating, or taking the negative, is more likely to prove a success in a studio than the open, but for some occult reason which I have never been able to discover, the subsequent operation of printing from the negative has always been looked upon as a very minor detail, requiring but little skill and capable of being conducted anywhere, and preferably on the leads or in the back yard or garden. Now a very little consideration will prove that this idea is an erroneous one, and that the erection of a studio for printing under glass, or the conversion of some part of a room into the same, will amply repay its primary cost, and that in a very short space of time. The advocates of open air printing will no doubt allege that prints are obtained more rapidly out of doors, and it is a fact that such might be the case if (Oh, those dreadful if's!) we had a climate where bright, dry weather was the rule, and rain, fog, and mist, the exception; but such not being the case, I contend that so far from time being gained by printing out of doors, the boot is decidedly on the other leg, as more prints can be obtained under glass, and, what is perhaps more to the purpose—where such a thoroughly conscientious set of human beings as photographers are concerned—the number will not only prove to be greater, but the general quality better. A terrible amount of time is lost to the out-door printer in rainy or showery weather; each little downpour necessitates the covering up of all the frames, and if the shower threatens to be prolonged they all have to be rushed indoors and wiped, and await another glimpse of brightness; and with such weather as we usually get at this time of the year, the covering and uncovering and taking indoors and out again of two or three hundred frames necessitates some considerable waste of time. In foggy or misty weather the moisture in the air condenses rapidly on the glass and materially retards printing, added to which the damp atmosphere also affects the sensitised paper, causing it to print red and weak. Occasionally a shower comes on so quickly that the frames are swamped before the printer can cover them, and a few drops of water find their way round the glass to the film side of the negative; the paper sticks and either necessitates the varnish being soaked off, or, in the event of the plate not being varnished, it requires re-immersion in hyposulphite of soda, followed by washing and drying: loss of valuable time again. Add to this the fact that the frames have to be hurriedly scrambled up, and that occasionally one falls to the ground and reduces the negative to fragments, such negative in nine cases out of ten being the most valuable one in print, and I fancy we have a strong argument in favour of inside printing.

In the summer, when we have less rain, the dust plays havoc, entailing constant dusting of the outsides of the frames, and even then it manages to get inside while the print is being examined. Then think of the numerous breakages caused by sudden change of temperature; a negative is brought in from a temperature of, say, 28°, the frame opened and the paper changed in a room warmed to about 50°, and it is then sent out again to be printed: there is a sudden ominous click, and the negative displays a crack from one side to the other.

All this might be avoided by printing under glass, and a printing studio can be erected at a very trifling cost when compared with what is cheerfully paid for the one in which the operating is performed. I have seen an arrangement which admirably answers the purpose required, in use at one or two studios I could mention, and which I may briefly describe as follows: A few boards are run out level with the sill of a back window to form a sort of flooring, and a glass roof is run from the level of the top of window sloping down to the end of the boards; this is extended about four or five feet on each side of the window opening, and is capable of receiving a considerable number of frames, which are thus protected from the rain, mist, dust, and change of temperature, added to which the printer is always at hand close to his work, and has not one half of the running about to do that falls to the lot of his brother who has to do his printing in the garden or on the leads. Platinotype and carbon printing benefit from this method of proceedure even more than albumen silver, or gelatino-bromide.

Should a bright sun glare upon the glass, a covering of white tissue paper is an advantage, as sun printing soon damages gelatine negatives. In the little island of Malta I have seen printing carried on through a covering of calico, so intense was the power of our best friend, the sun. However, it is a rare thing to get very much sunlight here in England, so it is advisable to fix even the tissue paper in a way that it can be easily removed and replaced. An excellent way is to stretch it upon little wooden squares just fitting into each pane of glass, and fastening with a button on either side, although one or two panes might always be kept covered during the bright weather for the purpose of printing the vignettes, which are always softer through tissue paper than when the aperture is uncovered. The best man to commission to erect the printing studio or box is one who is in the habit of building or glazing greenhouses, as they have a way of keeping out the water that the ordinary run of builders seem to be ignorant of, and it is necessary that such an erection should be water and dust tight.

A PHOTO negative bath dish has been patented by Mr. John R. Moeller, Grand Island, Neb. This is a dish with vertical end and side ribs, integral transverse ledges at the lower end of the end ribs, and a corrugated partition, to support a number of negatives in a single dish so that they will not bear against each other, while their lower edges will be held above the sediment in the bath.—*Invention.*

Nature calls attention to an "Album" which has been sent to it, containing reproductions of photographs taken in Celebes. "The collection has been formed," it says, "by Dr. A. B. Meyer, director of the Zoological and Ethnographical Museum of Dresden, and includes thirty-seven plates, on which about two hundred and fifty reproductions are printed. In 1870 and 1871 Dr. Meyer spent some time in Celebes, and the greater number of the photographs which have been reproduced he brought back with him. Others he has received from friends. We cannot say that the process employed has always yielded perfectly satisfactory results; nevertheless, the 'Album' contains many representations that cannot fail to interest students of anthropology and ethnography. There are groups of portraits from northern, central, and southern Celebes, and any one who carefully studies them will find that they give him a very vivid idea of the various types of the native population. The tables are accompanied by short explanatory notices, some of the best of which are by Dr. J. G. F. Riedel, Utrecht. The work is edited by Dr. Meyer, and issued by Messrs. Stengel and Markert, Dresden."

PHOTOGRAPHY IN HABANA.

The *Photographic Bulletin*, which is published monthly in Habana by the well-known depôt of photographic effects superintended by J. S. Lopez and Company, has already reached the last number of its eighth volume. Of this last number the most interesting contents are articles on eikonogen, contretypes, transparencies for the lantern on gelatine plates, and practical demonstrations.

The author of the article on eikonogen tells of his experience of this new developer, of its action on different combinations, and of its value, as he conceives it, in comparison with other agents. On the whole, he is of opinion that not enough is known of eikonogen to furnish matter for a definite and conclusive verdict, but so far as he has yet gone in his experiments, such hopes as he has formed about it have not been disappointed.

The exact place which eikonogen has to occupy in the photographic laboratory has yet to be determined; but there is no doubt in the mind of the writer of the article in the *Bulletin* that it presents brilliant qualities for the display of the most delicate details in the deepest shadows, requiring, as a rule, less exposure than is necessary with hydrokinone.

Discussing the various external forms of eikonogen, he says it presents itself sometimes as a grey crystalline powder; at others it discovers a deep, dark red with intersections; and again, at others, a colour known as *cenizas de rosas*, or ashes of roses. The colour of the solution differs, of course, according to the colour of the substance itself, and the experimentalist may obtain a dark vermilion, an intense green, and a green primrose, besides other still paler hues. The article, which is a long and interesting one, goes on to treat of the solubility of the agent, which, it says, varies about as much as its colour. As to the quantity of eikonogen to be employed, the author is of opinion that the published formulæ usually state an excess of what is actually required. In our own experiments, he says, we have found that a very small quantity of alkali gives results far superior to those obtained by a more concentrated solution. The nature of the alkali is unimportant. A caustic alkali may be used with the eikonogen, or a carbonate of potash or sodium. A formula for eikonogen is given by the writer, which, he says, produces peculiar clearness and brilliancy in the shadows. This formula is as follows:—

Sulphite of soda (cryst.)	...	...	194 grains
Carbonate of potassium	...	...	15 ,,
Carbonate of sodium ...	...	...	32 ,,
Water	...	...	8 ounces

The solution must be preserved in a well-stoppered bottle, and when required to be used, to every ounce of the solution must be added 6 grains of eikonogen. In place of the 15 grains of carbonate of potassium and the 32 grains of carbonate of sodium may be substituted, with excellent effect, 30 grains of carbonate of potassium. Bromide may also be added. This works very well on the bromised paper, and gives that crispness to negatives which is so highly prized by many artists.

The article on contretypes, communicated by M. Balagny, is of unusual length, and contains much profitable information; but the consideration of space forbids a detailed examination.

The practical demonstrations of E. de Saint Priest is another article which, owing to the same consideration, cannot be otherwise mentioned than as well worthy of an attentive perusal.

The volume of the *Bulletin*, which is concluded by the present number, contains many matters attracting the attention of the photographer. Especially may be mentioned the articles on mosaics, on colours in photography, on photo-miniature, on landscapes, on photography on wood, on the reproduction of old engravings, on the varied applications of photography, on the suppression of the red light, on impressions on clothes and other textile materials, and lastly, on the means of obtaining photographs in true colour relation by the medium of coloured crystals.

THE CHEMICAL PHENOMENA OF LIGHT.*

BY JOHN SPILLER, F.C.S., F.I.C.

As a past pupil of the late Dr. Percy, I have been permitted to read, and make extracts from, the photographic note-book of my old friend and much respected Professor, and I commence by acknowledging my obligations to the executors, who, through Mr. Hilary Bauerman, F.G.S., entrusted me with this very interesting record, and to Mr. George Shaw, of Birmingham, whose permission was freely given.

The account extends to twenty-three pages (quarto) in the note-book, and two extra pages fastened in, which are in the handwriting of our member, Mr. George Shaw; all the rest being in the clear manuscript of Dr. Percy, and illstrated by sketches of the apparatus used. The entries are arranged as a diary, commencing on the 28th October, 1844, and running on consecutively to some date beyond the 5th November. Then a break occurs, and there are occasional entries in later years—October 1850, and May 1853—with other suggestions for experiments, to which no specific date is attached. Further on the pages become a sort of general note-book, devoted to the entry of a variety of technical and metallurgical details, analytical processes, &c., with which Dr. Percy's subsequent career was so intimately associated. As showing the original intention, however, it should be stated that the cover of the book is endorsed "Light, October, 1844"—at a time when Percy was lecturer on Chemistry at the Queen's Hospital, Birmingham—and the first heading runs thus:—"Experimental Investigation concerning the Chemical Phenomena of Light. Record of Experiments, by G. S. and J. P., commenced on the evening of October 28th, 1844."

In some respects it was unfortunate that the work was begun so late in the year, for the weather on successive days was noted as "overcast and dull," "cloudy with slight rain," "dull November day," &c., and only on the 31st October and 4th November did the exposures get the full advantage of sunshine. But, on the other hand, it should be stated that the bulk of the experiments was comparative, and sometimes the slower action of the light enabled more accurate observations to be taken in the earlier stages than would have been possible under brighter meteorological conditions.

The first set of experiments was made with pure chloride of silver, precipitated from the nitrate by a slight excess of hydrochloric acid, and well washed with distilled water, by decantation, in the dark. The product was dried in a porcelain dish over a sand-bath, ground to powder, and divided out into several tubes;

* Read at the Photographic Society. The full title of this paper is "Early Experiments by Dr. Percy and Mr. George Shaw, on the Chemical Phenomena of Light."

the object being to expose them all simultaneously under various conditions, such as dry and moist air, or with dry hydrogen or ether vapour in sealed tubes; and, in one case, with potassium enclosed, so as to absorb any chlorine that might be liberated, as well as most of the oxygen contained in the air. In other words, this last tube was exposed in an atmosphere mainly of nitrogen, with an ingredient capable of taking up any evolved chloride; the potassium was not in contact with the silver chloride, but held back at one end behind a loose plug of asbestos. Details are given about the mode of drying the air, hydrogen, or other gas, and a sketch showing the disposition of the chloride of calcium and caustic potash tubes is appended. The sealed tubes prepared over night were left in a perfectly dark place until the next morning. The results (recorded by J. P.) were as follows:—

"October 29th. At half-past ten they were exposed in the open air to light; the sun was visible through the clouds, but the day continued overcast and dull. Darkening of the chloride rapidly took place in every tube, but so far as I could observe not more rapidly in one than another. They were turned round several times during their exposure to light, which continued until 4.30 the same day. From the fact of every particle of chloride not having been brought equally under the influence of light, part of the salt remained white, so that there was a mixture of black and white particles in each tube—hence the difficulty of estimating in a perfectly correct and satisfactory manner the precise degree of darkening that had been effected in each. However, that in *a* (ordinary dry AgCl, in a corked test tube) seemed to have undergone the *least* change, while that in *b*, *d*, *e* (hydrogen, nitrogen, and ether vapour) appeared to have been nearly equally affected; if anything, that in *b* (hydrogen) had been *most* altered."

There is no specific report about the final condition of tube *c* (that containing the *moist* chloride in a sealed tube), but it is evident that in this clotted state of the white chloride, the action of light at best must have been very partial. With regard to the influence of moisture, Dr. Percy goes on to say:—

"It must not be omitted that we cannot vouch for the strict correctness of the term *dry* chloride, employed in the preceding description, as we only dried it in a capsule over the sand-bath, and did not ascertain whether every trace of moisture had been expelled; so that if moisture had any influence upon the chloride exposed to light, the preceding experiments become unsatisfactory."

A second series of tubes was got ready for exposure to light on the following day; as before, five in number, but somewhat differently constituted. The chloride of silver was dried for six hours in a hot-water oven, and rubbed to fine powder for Experiment 1, or dried in the same way upon slips of glass for Experiments 2, 3, 4. Then arranged as follows:—

No. 1. Tube charged with dry AgCl in dry chlorine.

No. 2. Dry AgCl in dry nitrogen (*i.e.*, with potassium at one end of the tube, and fused chloride of calcium at the other).

No. 3. Dry AgCl in iodine vapour. (Turned yellow at once by partial formation of iodide of silver.)

No. 4. Dry AgCl in air with phosphorus. (This darkened before exposure.)

No. 5. Silver foil in dry chlorine. (The metal previously heated to redness, and dry chlorine gas passed over it for some time; the tube being full of chlorine when hermetically sealed.)

All exposed from 10 till 4 on October 30th (dull and cloudy day, with slight rain in the forenoon), and again from 10 till 5 on October 31st (a brighter day, with occasional gleams of sunshine).

Results.—No. 1 Tube. Scarcely perceptible change at the end of the first day, becoming sensibly darkened in ten minutes of bright sunshine, ultimately changing to an "ash grey."

Note.—October 31st, 1844.—"Now we learn from this experiment that, to a certain extent, the chloride of silver in chlorine affords an indication of the intensity of the chemical action of light; for that which underwent scarcely any perceptible change yesterday, became rapidly and sensibly affected to-day."

When put back again in the dark, the chlorine gas acted upon the coloured chloride, and in three hours it became perfectly white, ready to undergo a like change by repeated exposure. This observation induced Dr. Percy at a later period to propose the use of such an arrangement as an actinometer, which he described at the Photographic Society's meeting of June, 1853.—See this *Journal*, Vol. I., p. 84.

Nos. 2 and 3 tubes both changed colour to a chocolate brown, and, contrary to expectation, the iodide formed in No. 3 did not appear to retard the change, which the authors then supposed might be accounted for by assuming the existence of a chloro-iodide of silver sensitive to light, whereas pure iodide *per se* was known to be quite unaffected by exposure.

No. 4 tube also darkened considerably, and the phosphorous acid probably assisted the change, for it was bound to have had an influence even in the dark.

No. 5 tube, containing the chlorinated silver foil, acquired a beautiful iridescence by exposure to light, the film showing a play of colours, red or green, according to the direction of the reflected rays. The second day's exposure did not alter this appearance, but the *under* side of the foil began now to be attacked, and presented a dull leaden-grey colour. [Mr. Shaw repeated this experiment in a somewhat modified form, using Daguerreotype plates acted upon by the fumes arising from chlorine water. The results are described later on.]

A third series of tubes was now prepared, all charged with chloride of silver spread upon little glass plates, with the object of ascertaining whether the presence of moisture might have any influence. A pen-and-ink sketch shows the disposition of apparatus, with spirit lamp to warm the tube, and exhausting syringe to draw off every trace of watery vapour.

I. Dry AgCl in *dry* chlorine gas. Tube hermetically sealed.

II. AgCl in *moist* chlorine gas. Tube hermetically sealed.

III. Dry AgCl in dry air. Partial vacuum and tube sealed. Exposed simultaneously from 10.20 until 5 o'clock, October 31st; fine day, with gleams of sunshine.

Results.—The last rapidly changed colour (in ten minutes), and went on darkening. II. was more quickly discoloured than I., but the atmosphere of chlorine hindered the change; and the former (moist chlorine) proved most operative in bleaching the darkened chloride when the tubes were taken indoors at 5 p.m., and by nine

o'clock, as seen by gaslight, the white chloride was quite restored.

In order to set at rest this question of chlorine hindering the action of light, other experiments were arranged in which the white chloride of silver, dried upon a watch glass and covered with a flat glass plate cemented on with white wax, was exposed to light under a bell-jar, with corresponding apparatus beside it in which chlorine (and afterwards bromine) had access to the chloride of silver. The results were, as before, that only a slight darkening occurred when chlorine had access, and the bleaching at night took place as usual. The authors sum up as follows:—"We have now distinct proof that the vapour of chlorine does either retard, or otherwise modify, the chemical action of light. Is this owing to the colour of chlorine?"

Next came comparative experiments with bromine, in which a difficulty occurred from the bromine vapours attacking the wax, so the white chloride of silver was enclosed in hermetically sealed glass tubes, placed within bell-jars filled respectively with chlorine and vapour of bromine. Although the latter manifestly obstructed more light, it was found that the white chloride in the jar of bromine was *more rapidly and deeply coloured* than that contained in the jar of chlorine. "It would appear, then, (say the authors) that the modification induced in light, in its passage through an atmosphere of chlorine, does not depend upon the *colour*; because, if that were true, the degree of modification should vary directly with the intensity of colour, and should consequently be greater in the case of light passed through bromine, than in the case of light passed through chlorine."

Finally, the crucial test of exposing chloride of silver in sealed tubes, placed within a jar of *colourless* nitric oxide gas over water, and another one into a large stoppered bottle of the same gas, with occasional admission of air, so as to produce the *red* nitrous acid fumes, showed most distinctly that with the colourless gas the darkening proceeded as rapidly as in air; whilst in the deep red gas the darkening was completely prevented for some time, and only very slowly changed to a lead-grey hue as the ultimate effect of protracted exposure. Here the observed difference could only be accounted for by assuming that the highly coloured nitrous acid gases cut off the chemically active rays, and apparently did so much more thoroughly than the bromine vapour.

Experiments by Mr. George Shaw, November, 1844.—A couple of Daguerreotype plates was cleaned with dilute nitric acid and powdered tripoli, rubbed afterwards with dry cotton wool, and highly polished on a velvet buff sprinkled with charcoal powder. One of them was exposed, face downwards, for *thirty minutes*, to the fumes arising from chlorine water, and the other for *twelve hours* to the same treatment. Both were alike in appearance, coated with a deal-white film of chloride of silver, which was very compact, had considerable lustre, and reflected the images of neighbouring objects with tolerable distinctness. So prepared, half of the twenty-four hours' plate was covered up to protect it partly from light, and then both plates were exposed for several hours on a "very dull day, the sky thickly clouded."

The surfaces gradually changed to a moderately dark slate colour, neither approaching blackness or the tint assumed by precipitated chloride of silver under like circumstances. On the next day, November 4th, which was "very much brighter," the two plates were put out again, this time the half of the thirty minutes' plate being covered up, and both exposed for more than an hour to "hazy sunlight." They now suffered a very marked change; the slate-colour disappeared, and the surfaces assumed a rich brown colour, with very metallic lustre, closely resembling the appearance of old bronze medals, and those parts which had been longest exposed to light actually assumed a much *lighter* colour than the surfaces that had been partly protected.

Here the only circumstance calling for notice is the fact that Daguerreotype plates were sometimes made of rolled Sheffield plate, the upper layer of which was standard silver (containing about one-twelfth copper, and the sensitive surface was, therefore, possibly a mixture of cuprous and argentic chlorides, in which the latter largely preponderated).

Amongst other interesting suggestions given in Dr. Percy's note-book was a proposal to try, as a substitute for the amalgamation process, the extraction of silver from its ores by first attacking them with ferric chloride solution, and then dissolving out the silver chloride so formed with a solution of hyposulphite of lime. There is no record of experiments actually performed, but we know that the process was adopted later in the treatment of certain silver ores, before other improved methods came into general use.

"Indigotic acid in Calotype, Oct., 1850," is another entry, but it is not easy to guess the purport of such an experiment, unless it was an early idea of working with stained films.

"May 29, 1853. Photography. In the negative or positive impression in the Talbotype process, in what state is the silver? If it be *metal*, mercury should certainly remove it. Try the experiment. Is AgS soluble in KCy? I think not; if not, then after exposing a positive to HS it should not be obliterated by KCy. But is it not so?"

At this date I was an assistant in Dr. Percy's Laboratory at the Royal School of Mines, Jermyn Street, and I well remember some experiments being tried with hot and cold mercury to extract the silver from paper photographs, but it was found impossible to get contact with the liquid metal. I do not know whether mercury vapour was ever tried for the purpose of forming an amalgam, and then extracting this with the liquid mercury. On the second point, I also remember Dr. Percy toning some silver prints on plain paper by exposing them to sulphuretted hydrogen, and these were afterwards shown at one of the Society's exhibitions.

About this time Dr. Percy, being on the first Council of the Society, was frequently engaged in photographic experiments, and testing the permanence of silver prints, on which later he was invited to report.—See *Photo. Journal*, Vol. II. pp. 175, 190, 251.

M. Leon Vidal writes to us that he has just won the case in an action at law brought against him in Paris by Mr. B. J. Edwards, for certain criticisms on isochromatic photographs, published in the *Moniteur de la Photographie*, of which M. Vidal is the editor. The court considered that M. Vidal had not exceeded his right of criticism.

North Middlesex Photographic Club.—An outing has been arranged for Easter Monday to Welwyn, by the train leaving Finsbury Park, G.N.R., at 10.15. Any interested are invited to join. On Monday, Thomas F. Smith, F.R.M.S., delivered a lecture on "Micro-Photography," illustrating it by means of lantern slides, and showing the method of making the same. Both botanical and histological slides of interest were shown; some of them were enlarged 2,000 diameters.

EMULSIONS.*

BY WILLIAM BELL.

The accompanying formulæ for the preparation of a gelatine emulsion for photographic purposes are the result of several years of constant study and experimentation on the part of the writer, and it is believed that if the details of the process are strictly carried out with but an ordinary degree of ability, plates fully equal to the best brands in the market can be easily and uniformly prepared.

Ammonia-Nitrate Emulsion.

No. 1.—
- Boiled water ... ... 1 ounce
- Iodide of ammonium ... ... 5 grains

No. 2.—
- Chloride of ammonium ... ... 20 grains
- Water ... ... 4 drachms
- Acid, nitric, a drop or two to render the solution acid.

No. 3.—
- Nitrate of silver ... ... 60 grains
- Water ... ... 4 drachms

To the nitrate of silver dissolved in the water (No. 3) add, drop by drop, the solution of iodide of ammonium (No. 1), until the precipitate of iodide of silver formed ceases to dissolve in the solution. Then pour in the solution of chloride of ammonium (No. 2), wash the chloride of silver formed with three separate waters, draining each time; then add some pieces of broken glass to the moist mass, and then 16 grains of Nelson's No. 2 gelatine, and dissolve with gentle heat (temp. 90°—100°). Shake well, and add the following solution:—

- Water ... ... 4 drachms
- Bromide of potassium ... ... 43 grains
- Liquor ammonia ... ... ½ drachm

Pour this solution at one time into the bottle containing the melted gelatine and chloride of silver; cork the bottle to retain the ammonia. Keep at a temperature of 90° for fifteen to twenty minutes. Test the emulsion by a drop on glass, looking through by transmitted light from a match to see if all reddish colour is gone. When this has disappeared, and the emulsion viewed by transmitted light is greyish blue or green in colour, the heating has proceeded far enough; and then 120 grains of Heinrich's gelatine (previously softened in water, and melted at a temperature higher than 90°) are added to the emulsion. This is to be well shaken, and then allowed to cool by gelatinizing it slowly upon the sides of the bottle. Let it stand six hours. Re-melt at a temperature of 100°, gelatinizing again upon the bottle. Allow to stand six hours, and melt once more. It is now ready to be mixed with the boiled acid emulsion (see following formula). Or, if the ammonia nitrate formula is alone to be used, the melted emulsion, as just made, is to be poured into a dish, and allowed to cool and set: when cold, placed on a clean cloth (mesh 1-80 inch), squeezed through, the finely-divided mass well washed, drained, and pressed under weight to expel excess of water, re-melted, filtered through white silk, and then coated on glass. The final amount should not be more than three ounces: if more, then the gelatine has absorbed too much water in washing; to avoid this, press longer. In preparing this emulsion, it has been found that the presence of the bromide, with heat and free ammonia, favours the acid and alkaline emulsions. When the plates are coated, they can be immediately passed through a small opening into an adjoining room, kept at a uniform temperature of 50°, with free circulation of air, and dried either on racks or on nails on the wall, face outwards.

* Read before the Photographic Society of Philadelphia.

Glass.—This should be previously cleaned by soaking it in a mixture of equal parts of nitric acid and water, well washed, dried on racks, polished with cuttle-fish bone and water, using a piece of well-washed flannel. This should be washed with a weak solution of soda, so as to remove any traces of oil or grease. The plates, after being dried, should be edged with a thick solution of gum tragacanth, by means of a small camel's hair brush tied to a short thin stick, with the end of the stick projecting a short distance so as to act as a guide for the brush. The plates should then be stored in the hot room until wanted.

Filtering.—If this is done in the hot room, it can be accomplished by passing the melted emulsion through absorbent cotton; otherwise a hot-water jacket should be used for the filtering funnel, and the emulsion passed through well-washed white silk or cotton.

THE HAVRE PHOTOGRAPHIC CLUB.

In January, attention was invited in these pages to the circumstance that Havre, and more especially its adjacent town of Trouville, on the other side of the mouth of the Seine, offers attractions to those photographers who, when they have but three or four days' leisure, desire to spend that short time upon a foreign shore. Among London photographers, the popular landing-place for such a holiday has been Antwerp from time immemorial; Brussels, Malines, Ghent, Bruges, and Dinant being one or more of them also visited. Of late, the stream of brief holiday seekers has been slightly diverted to Rotterdam and places adjacent thereto. France alone, which is nearer to our shores than any other foreign country, seems to have its nearest seaport towns avoided by the greater throng of English photographic tourists, although Boulogne-sur-Mer is but three hours' journey from London, is exceedingly picturesquely situated, and presents to the photographer that attraction which he cannot get at watering-places near London—sunsets at sea. The reason of this disinclination of the photographer to make short photographic excursions to France is, no doubt, the uncertainty whether he will not unintentionally get into trouble on the plea that he is taking pictures too near fortifications, or in some way or other coming into adverse contact with French officialism. France is over-regulated. The troubles in which various harmless tourist photographers have found themselves in France, through not understanding local regulations and having no means of ascertaining them without losing half-a-day in the inquiry, have been from time to time published in the English newspapers, with the result that the feeling of "uncertainty" about having a spoilt holiday induces others to go as usual to Belgium, where they know that they will be well received.

We recently mentioned the existence of these deterrent influences to some of the officers of the Havre Photographic Club. They stated that, so far as they knew, anyone could take outdoor photographs of the interior of Havre, and they thought along the beach also, but would make inquiry, and send full information on the subject. The information will be welcomed, and, at the same time, they can state, perhaps, whether there are any impediments to photography in Honfleur, Trouville, and Caen. Recently we found none in photographing at various places on the lower reaches of the Loire, and found the people everywhere in that district polite and exceedingly friendly.

M. Goupil, honorary secretary to the Havre Photographic Club *(Photo-Club Havrais)*, sends us the report of its Committee of Administration about the work of the Club during the year 1889. The report sets forth that the Havre Photographic Club was founded at a meeting held on the 13th of June, 1889, and began to exercise its functions on July 1st following. The Club is composed entirely of amateur photographers, and has for its object the diffusion of the photographic art, and of all its applications. At the outset the Club had twenty-one members, and a provisional Committee of Administration, the functions of which expired at Christmas, 1889. The members of the committee were:—Mr. Emile Rougé, president; Dr. Perrichet, vice-president; Mr. David, treasurer; Mr. Acher, assistant treasurer; Mr. Albert Goupil, secretary; Mr. P. de Jonekheere, assistant secretary; and Mr. Soret, librarian. The premises of the Club were and are at 27, Rue de Normandie, and had been previously occupied by a photographer; the house has a *salon* suitable for meetings, a studio, and a laboratory: adjoining it is a large garden.

Messrs. Fleury Hermagis presented the Club at the outset with an excellent portrait lens three inches in diameter, and Mr. Mackenstein presented it a well-made camera. Mr. David, its treasurer, presented to it a picturesque background, and the Club bought a plain one. The studio is appreciated by the members, as most of them would have had difficulty in fitting up anything of the same kind at home.

The Club has three classes of members, namely, active, corresponding, and honorary. The active members pay an entrance fee of ten francs, and an annual fee of thirty-six francs. The corresponding members pay fifteen francs a year. The fee paid by each honorary member is not limited, but should not be less than ten francs a year. The honorary members have the right to a certain number of proofs, selected from among those exhibited by the Club.

The Club has developed rapidly. At the end of 1889 the number of its active members was 39, of its corresponding members 4, and of its honorary members 68—total 111. At a meeting of the Club held Dec. 20th, 1889, the following officers were appointed for the year 1890:—Dr. Perrichet, president; M. David, vice-president; M. P. de Jonckheere, treasurer; M. L. Poupel, assistant treasurer; M. Albert Goupil, secretary; M. Dorey, assistant secretary; and M. Soret, librarian. The Havre Photographic Club is prospering financially, notwithstanding the expenses of starting it. The Club had a public exhibition in Havre of the work of its members, which exhibition was open from Dec. 21st to Jan 5th last, in the Passage Bernardin de St. Pierre; the premises had been kindly lent for the purpose by M. Pellot. The exhibition was highly popular, and sometimes visited by more than 1,300 persons in a day.

At several meetings of the Club experiments have been made which have a bearing upon points in theoretical photography. M. Soret has made some experimental investigations in relation to the photographing of the electric spark. Several photographic excursions have been made by the Club, but all of them limited to the neighbourhood of Havre. During the early part of the present year a course of lectures on practical photography is being given every other Sunday, from ten o'clock until midday, in the rooms of the Club, and it is expected that these lectures will considerably augment the number of its members.

EXTRAORDINARY ASSERTIONS.

A circular has been handed to us entitled, "The New Colour Process in Photography," purporting to contain matter reprinted from *Brighton Society* of Saturday, August 31st, 1889, as follows:—

"Plain photography has made rapid advances within the last few years, and many efforts have been made by the photographic scientist, both at home and abroad, to produce a combination of the chemical action of light upon the plate and the colour vibrations that will suit the light and shade of the image. Further, the aim of experimenters has been to produce these colour effects upon the negative alone, but not with much success. Professor Ives, of Philadelphia, has laboured for years in this direction, but he has been obliged to confess that the results are evanescent. I have, therefore, much pleasure in drawing attention to the discovery of the new colour process in photography which has been made by Mr. J. E. Mayall, beautiful specimens of which may be inspected at his studio, 43, Cannon Place, Brighton.

"He has started on a new basis. Aided by spectrum analysis, he has produced a film which registers every vibration of light from the deepest red and green through the whole gamut of the spectrum to the violet and grey rays of Sir John Herschel. When this film is looked upon at an angle, the vibrations of light can actually be seen on the negative. In the process of completing the photograph these vibrations are transferred to the positive film, which registers with great accuracy the vibrations of the image. Thus he has sub-divided the subject into negative and positive photography, and by applying highly attenuated forms of colour to the delicate vibrations which the light has made—and which colours assimilate themselves to the image—he has succeeded in producing a picture in which the lights and shades of the original are brought out with an accuracy unapproachable by any other method. The colours are attenuated to the 180,000th part of a grain, and are sufficiently transparent to fill up the interstices of the portrait which the light has made. Professor Owen, who has inspected Mr. Mayall's new process, says:—'It suggests the conditions whereby the thousandfold varieties of colours are selected by flowers. I gaze upon my garden as if I had a new sense. Those conditions had never been the subject of a thought when I entered with my neighbour Chadwick your studio. But when I received evidence of the process by which not only forms, lights, shades, but also tints, in finest gradations, had been secured in the photograph before me—a second self-living and gazing at me—I began to feel that you were leading the way to a cognition of the subtle *modus operandi* to which we are indebted for the countless beauties of feathers, scales (of butterflies), and flowers that adorn our world.' Amongst the specimens I have seen at Mr. Mayall's studio, and which it should be mentioned are produced in a few minutes, are several which exhibit all the delicacy and finish of a high-class miniature by Cosway.

"Mr. Mayall possesses many high testimonials to the importance of his discovery, besides that referred to above by Professor Owen. Among them is one by Dr. Thudicum, the organic analyst to the Government. Mr. W. H. Wallen, the expert in the Patents Office, having made an elaborate and exhaustive report upon Mr. Mayall's new process, says, 'The conclusion at which I gladly arrive is that Mr. Mayall's process is the most perfect of its kind, both in regard to its perfection of optical form, its selection of the precise colour of the sitter, and its permanency.' A good deal of Mr. Mayall's success in the production of this new artistic process lies in the fact that he has discovered the way to help Nature, and that being so, there can scarcely be a doubt that the result being so beautifully effective, it will soon supersede every other method of colouring."

One would like to be informed if the writer of the foregoing knows anything about light or photography, and if so, whether he or anyone else will show the vibrations on the negative of which he speaks at a meeting of the Photographic Society; also the production of a positive image by the transference of the said vibrations, as stated.

WITH THE LUSHAI FIELD FORCE.*

BY T. D. LATOUCHE.

Leaving the Kurnafuli, with the *dolce far niente* of its dugouts, at Demagiri, and following a bridle-path made by the expedition of last year, we plunge at once into jungle as dense as any to be found in India. How the engineers managed to find their way through it is astonishing, considering they were seldom able to see more than a few yards ahead, and the hills are cut up by innumerable ravines in bewildering fashion. For the greater part of the distance to Fort Lungleh, forty-three miles, there was not a vestige of a former path. The immense trees, with hundreds of huge creepers hanging in festoons from one to the other in wild confusion, with the path winding beneath them, present one with pictures of great beauty at every turn, but it is impossible to transfer these to the camera, at any rate to a detective, as the dense canopy of leaves overhead shuts out the greater part of the light, and an instantaneous exposure results in a blank plate, or one showing the faintest possible image. Moreover, one view of such jungle is so like another, though all are beautiful, that it requires something of the human element to make such a scene interesting enough for a picture, and it is only where one can bring in a string of coolies or mules on the march, or a camp with its background of trees, or a stream crossed by a bamboo bridge, that one feels inclined to bring the camera into play. Such scenes are not wanting on a march like the present, but at ordinary times the main attribute of the jungle is its vast loneliness, and silence too, for it is surprising how few signs of animal life, even of birds, one can detect.

Fort Lungleh is built on a narrow ridge at an elevation of 3,500 feet above the sea, near the site of an old Lushai village, Saipuya's. It is surrounded by a stockade of upright timbers, within which the huts occupied by the force of the Frontier Police, who garrisoned it during the last rainy season, make a picturesque group, but its cramped position renders it difficult to get a good view of the whole work. There is a magnificent view to the north down the valley of the Dullesary or Klong river, and to the east, in which direction lies the goal of our hopes, the village of Haka, which a column from Burma is also making for. Hills piled on hills in endless confusion make up the view, all covered with a uniform expanse of dark-green jungle, amid which patches of brighter green show where the ground has been "jhúmed," or cleared for cultivation in former years, these patches being now covered with a dense growth of bamboos. A few brown patches also show where the forest is being cut down for this year's cultivation, and, with a good glass, near these a villager can generally be discerned. The large, neatly-built bamboo huts, supported on piles, like most of the hill villages of Assam, stand well out from the surrounding jungles. Most of those in sight belong to so-called friendly villagers, to whose friendship, however, it would not be well to trust in most instances without an escort at one's back. But some of those near Lungleh have shown their sincerity by assisting in cutting a road through the jungle to the north, prompted no doubt by self-interest, as the chief Lieupunga, whose village lies in that direction, is almost as much an enemy of theirs as of the British.

I accompanied a reconnaissance party sent out to inspect this path, which we found was cut along the banks of the Klong river, flowing due north towards Cachar, where it goes by the name of the Dullesary. For two marches we were able to use bamboo rafts, and numerous were the pretty views which we came across as we rounded bend after bend of the river. Some of these, when a raft or a string of coolies fording the river could be brought into the picture, were duly transferred to the camera, also a "jhúm" hut, in which we spent a night, and a group of friendly Kuki chiefs, who came down to interview their friend, Mr. Murray, our popular political officer. Altogether we were away from Lungleh for eight days, and had a very pleasant time.

After a long delay at Fort Lungleh, waiting until a sufficient length of the road ahead should be completed to make it worth while to move on, I came on as far as the camp I am writing from, which is about twenty miles from the Fort, and situated on the Mât river, a fair-sized stream which joins the Koladyne some miles below. Here there is some good fishing to be had, or rather was, for, after the first few days, when the bag included a 20 and a 17-pounder, the fish have unaccountably stopped running, and not even the most artfully thrown spoon will now induce them to leave the depths of the pools they live in. The scenery on this river is very fine, the hills being more precipitous and rocky than those on the Klong, and there is plenty of work for the camera along its banks.

Since coming up here I have seen two other forms of the detective cameras belonging to officers of the expedition. One of these is the Kodak, which is no doubt a handy little instrument, and if the paper it contains could be depended on, would be a capital sort of camera to carry with one where every extra ounce of baggage has to be considered; but, on development, none of the pictures taken with this one were entirely successful; in fact, it was difficult in some cases to make out what the picture was meant for, and the paper showed the same whitish blotches that I described in a letter written to the journal some time ago concerning paper negatives. The other camera is one of those circular "secret" affairs, which take six small pictures in succession on a round plate; I developed one or two of these for the owner of the camera, but though the image came out fairly well in some cases, the plates frilled so badly that they were of no use whatever. On the whole, I think that an ordinary detective, in which plates of an admittedly good description can be used, is the best to take on an expedition of this kind, and I am well satisfied with the performance of my "Optimus." By the way, I see that Messrs. Perken and Rayment have brought out another form of this camera, in which there is an arrangement for bringing each plate into position for exposure without opening the camera, but it seems to me from the diagram given with the advertisement that it must add considerably to the bulk of the camera. Can any reader of the journal speak from personal experience of the performance of this new form, and if so, will he, of his kindness, publish his opinion of it?

Camp Mât River, 10th February, 1890.

The Library Catalogue for 1890 of the Photographic Society of Philadelphia is to hand. The introductory notice says that "a noteworthy feature in the Library is the number of complete sets of journals, dating from the earliest days of the art down to the present time. Although separate text-books of the various branches of photographic science are not wanting in the Society's collection, the journals—which detail the progress of the art from day to day—still remain the most useful sources of information."

* From the March number of the *Journal of the Photographic Society of India*.

Notes.

Photographers who make a speciality of copying pictures have been excessively busy during the past fortnight, and will continue to be so until "sending-in day." Indeed, it is said such is the desire for artists to have their pictures photographed, that work has been turned away. No doubt the fashion of illustrated catalogues has led to this rush of business. Unquestionably artists are immensely the gainers by the publication of copies of their exhibited pictures, and they are now not contented with the sketch notes made by themselves—which were once considered sufficient—but prefer to have the originals photographed and reproduced by the Meisenbach or some analogous process. Their practice, however, of delaying the completion of their works until the very last moment rather hampers the photographer, who finds himself inundated with commissions which he is unable to execute in the limits of time allowed. Very few—if any—artists who are also photographers photograph their own pictures. As everyone knows, copying with the camera is a special study in itself, and a study which requires infinite judgment and knowledge of the relative value of tints.

Apropos of the illustrated catalogues, the majority of the artists make no charge, and make no objection to copies of their pictures appearing. One or two, on the other hand, take a keener view of the matter, and stipulate for a fee. We do not see why they should not. Though the illustration may benefit the artist from an advertising point of view, the publication of an illustrated catalogue is purely a business affair, and, we presume, is not run for the benefit of the artist, but for the benefit of the publisher. Why, then, should the latter not pay for his material? Of course, in fixing the price, the value of the picture to the artist as an advertisement would be taken into account.

"The "International Cyclorama," the title of a species of entertainment now being given in London, seems to indicate a revival of the stereoscope, which for some years has fallen into disfavour so unaccountably. To see the "Cyclorama," the visitor seats himself in a chair, and looks through a pair of lenses fixed in a large circular cabinet. A series of instantaneous views then passes before his eyes, sufficient time being given to enable him to thoroughly take in the points of the pictures. The pictures now on view illustrate the scenery of the Rhine, and the Paris Exhibition, and it is intended from time to time to replace them by other series illustrating other European countries.

Taking snap shots with an instantaneous detective camera is very much like shooting a bird on the wing. We are inclined to think that dependence on "finders" is of not much use, and that to be successful in "shooting folly as it flies," one must get accustomed to act almost by instinct. A good instantaneous photographer is more likely to be born than made. A writer in a sporting magazine, relating his experience in shooting, somewhat bears out the theory. When he commenced trap shooting he "thought it was necessary to lay my cheek down on the gun stock and screw around until I got my eye and the sight in a line with the object." The result was that he was more often at the foot than at the head of the class. Then he got reckless and fired without taking all this trouble. To his surprise he smashed the glass ball at which he fired, and having got hold of the idea, he afterwards seldom saw the sight or even the gun when he pulled the trigger, and his success was surprising. Applying the same plan to field shooting, he found it succeeded. "Of course," he remarks, "allowance must be made for birds crossing, rising, or falling, but that is instinctive, and seldom thought of by our most successful shots. Indeed, thinking has little to do with it. If it had, one's bird would be out of range before he could collect his thoughts." This puts the matter on all fours with instantaneous photography. The action of exposure must be simultaneous with the sight, or the much desired picture disappears.

The possibility of photographing a horse race at the winning post has often been talked about. The new racing club at Hurst Park, shortly to be opened, intends to try the thing practically. A new "patent camera" is spoken of, with which it is proposed to take instantaneously the "finishes," while additional instruments will be also stationed at various jumps on the course. So enthusiastic are the believers in this "patent camera," that a syndicate of well-known persons has been formed to work it commercially.

The attention which Mr. Herbert Marshall's studies of London are exciting shows how attractive and popular are pictures of life in the great metropolis. The camera has been employed times out of number, but although photographs admirable in execution and artistic in arrangement have been taken, these are very few compared with the great mass of mediocrities. To render London properly requires much patience and a good deal of luck. It is so rare that the traffic takes the exact disposition necessary for a well-balanced picture. The murky atmosphere, even on sunny days, very frequently spoils all the photographer's efforts. We believe that the proprietors of one of the illustrated papers some time ago contemplated a series of reproductions from photographs, but gave up the attempt because they did not come up to their idea of what constituted an artistic picture. London has yet to be photographed. Hitherto it has not had justice done.

Photography appears to great advantage in connection with some experiments made on the Continent with smokeless powder. To show the difference between a volley fired with the ordinary powder, and the new variety, photographs were taken at the moment the commander gave the order to "fire." In the case of the first named, a thick, black cloud is represented, through which the gunners are barely perceptible, while, in the second case, only a thin haze is noticeable.

PHOTOGRAPHY IN FLORENCE.

The *Camera Oscura* or Monthly Review of the Progress of Photography, which is published at Prato, near Florence, under the able supervision of Professor L. Borlinetto, with the calloboration of Professors L. Meil, Piccioli, A. Rossi, G. Jankovick, D. Ratti, L. Ciardelli, Sac. Sobacchi, D. Leuzi, Danesi, G. Glisante, Dr. L. Gioppi, and its energetic editor Germano Salvi, is now entering its eighth year of life. No Italian photographic journal born in Italy can boast of an equally long existence. It has not, indeed, escaped the sickness and various maladies which infest, unfortunately, adolescence. There have been times—disastrous epochs, says its editor—when this journal has seemed to be threatened with the adverse fates of the family of Saturn. It has on some evil days presented the appearance of a child desiring to devour its own progenitors, but such an accursed hunger and infuriate longing has been happily stilled without any sacrifice of artistic life; and the *Camera Oscura*, with its mystic motto taken from the pages of G. B. Porta. . . *Ex qua maxima natura si nobis illucescere possunt*, still lives, and is doing well. *Resistance at every cost* is, we are told, the motto blazoned on its ancient banner, and this motto the editor is determined to flaunt in the face of adversity, and to maintain in its full significance, undeterred by any expense and undismayed by any sacrifice. As a handsel of this heroic sentiment the readers of the *Camera Oscura* are promised a carbon photograph with the signature of the illustrious Italian statesman Quintino Sella, the work of Luigi Luzzati, a name well known in Italy and elsewhere.

The present number of the *Camera* opens with an article by Bettini on a subject of great interest to every professional photographer—the artistic property in photographic works.

A committee, it appears, was formed in Italy in the year 1855, under the able presidency of Carlo Brogi, of Florence, for the sake of obtaining from the Government some legislative disposition for the legal protection of works of photography. After much expenditure of time and labour, a letter was received by the committee from the Minister of Agriculture, Industry, and Commerce, to the effect that as the law with regard to intellectual labours included those of photography, any new legislation was inexpedient and unnecessary. Like other artistic works, such as painting and sculpture, photography deserved to be, and was, in the opinion of the Minister, under the tutelary ægis of the law. Like painters, photographers also had their exclusive rights to publish and to reproduce. The only difficulty was to distinguish counterfeit or imitations where several photographers possessed a copy of the same monument, statue, or picture.

This, however, in the opinion of the Minister, was a question rather of a juridical than of an administrative nature. A competent jury well acquainted with photographic details would, in the majority of cases, have amply sufficient data to pronounce their verdict as to whether any given photograph was or was not a counterfeit or imitation. In fine, the Minister assured the President of the Committee that he had determined to admit registration in the case of photography for the preservation of the author's rights, whether in the matter of original works, or of photographic reproductions.

Notwithstanding all this, Signor Bettini declares that arbitrary reproductions and counterfeits are as frequent as ever. He utters loud lamentations. But if it be any consolation to him to have companions in misfortune, he has many. It is not in Italy alone that proprietors, as he complains, of leading photographic establishments condescend to reproduce the work of others solely for the sake of illicit profit. And indeed it is time, as he affirms, to put a stop to such abuses and infractions of the law. Men who are capable of such dishonesty should, says Signor Bettini, not only be denounced at the bar of public opinion, but also legal proceedings should be taken against them under the statute which covers with its protecting shield all intellectual arts and labours, among which photography, as has been already shown, is to be numbered.

The next article in the *Camera* is the continuation of an instructive communication on Instantaneous Photography, giving practical rules about its expedition, rules which are at the same time exceedingly simple, and would, if borne well in mind, prevent the occurrence in the photographic laboratory of many vexatious mistakes. They all rest on mathematical considerations, by which their exactitude may be verified. The concluding article in this number treats of the Development of Latent Images.

A WRITING INK PRINTING PROCESS.

BY GENERAL JOSEPH B. BROWN.

In looking over my note-book to find some subject in order to comply with your request for an article, I came upon the appended particulars, which, you will see, were written for publication quite *ten years* ago. As I was not quite satisfied that I might not still farther perfect the process, or at least render the manipulations so exact as to ensure uniform and constant results, I deferred making it public till I had further leisure for working it. But circumstances prevented my ever taking it up again, till it was, in the pressure of other duty, absolutely forgotten. But when I found in an old portfolio some of the prints then made by the process so well preserved, and so superior to any specimens which I have ever seen resulting from the attempt to get black tones from "blue pictures," or to tone or dye the faint but beautiful prints upon plain bichromated papers, I have thought that this process deserves some attention and may be of interest, or possibly lead to a popular process. Samples of the prints then made I enclose. Remember, these prints were made ten years ago, and though "ink pictures," they were but slightly deteriorated in tone—a slight treatment with a weak gallic acid solution has brought them up to their original strength, and I see no reason why they should not, even after the lapse of fifty years, be restored in the same manner should they become faded, which is more than can be said of any silver print.

I intend, at my earliest leisure, to work at this process, according to my original idea, till I can ensure exact results, for as you will see by an examination of the prints enclosed, the effect is due to the action of light in rendering the chromated albumen insoluble the same as in pigmented gelatine in the carbon print, and of course it is liable to the same mishaps of over-exposure, rendering the whole insoluble, or of under-exposure when the carbonate of soda would remove everything, instead of producing the proper gradation to receive the required degree of staining or dyeing.

I remember that I had the best results from the use of a weak solution of gallic acid and a prolonged development in the iron bath.

Since Mr. Mungo Ponton, in 1839 or 1838, published the method of producing photographic prints by exposing papers coated with bichromate of potash under a negative to the action of the light, experimenters have never ceased their endeavours to render this agent the basis of some process by which it could be made to take the place of the salts of silver for positive prints. Its extreme solubility in plain water, by which the portions unacted upon by light can be so perfectly removed from the paper, is its immense advantage, since the silver salts require a special solvent, which itself is difficult to remove from the paper after it has done the like office for the silver, and which is unquestionably one of the chief causes of the want of permanence of silver prints. The process of Mr. Ponton gives but feeble images, and though most beautiful for their minuteness of detail and exquisite gradation, are of no practical value as pictures.

Twenty-five years ago Mr. J. Perry, an English gentleman, thought he had accomplished the business, and patented his process, which was exceedingly ingenious, and made use of some very interesting chemical reactions. His process was this, briefly:—After the original bichromate print was thoroughly washed, it was placed in a solution of protosulphate of iron, and then, after washing, was treated with gallic acid solution, which developed an "ink picture." It was found impossible in practice, however, to preserve the purity of the whites of the picture, or to prevent the paper from being irregularly stained, and the tone of the "ink picture" was also far from agreeable.

Innumerable attempts have since that time been made by French, German, and English experimenters to overcome these defects without success, till this process and its allies have been wholly abandoned.

The "Foxtype" was patented, depending upon the reaction of aniline upon oxide of chromium, but it would not give half-tones, and was only suitable for map reproductions and line work, such as the multiplication of plans. After the fact that bichromated gelatine is made insoluble by the action of light was known, and the "carbon print" was gradually brought to perfection, the use of the bichromates as printing agents was wholly given up, except in connection with some form of gelatine and pigment printing.

I find, however, in the Photographic News (British) of October 7th, 1876, a communication from the government photographer in Madras, India, describing a process for developing bichromate and gelatine prints, without pigment, by means of protosulphate of iron and pyrogallic acid, in which he claims to have succeeded in preserving the purity of the whites by glacial, acetic, and citric acids. This claim, however, proved fallacious in the hands of others.

Mr. Wharton Simpson, in an editorial, recapitulates these failures above-mentioned, as well as his own, and suggests that the only method by which the staining of the paper can be prevented would be to combine the process of dyeing, or developing, with single or double transfer, as in Mr. Swan's carbon process, suggesting logwood infusion as a promising agent for effecting the dyeing of the chromic image. No success has met this plan, it is evident, for nothing has been heard of it since that time.

In the last number of the Scovil Manufacturing Company's *Photographic Times* (January, 1890), a very pleasantly written article appears, by a gentleman who calls attention to "an unrecognized bichromate process," describing the old patented process of Mr. J. Perry, and speaks of it as "my process"! It is undoubtedly a most interesting adaptation of a well-known chemical reaction, from the cheapness of the salts used a great acquisition, and, if it could be freed from its apparently inherent defects, would be likely to supplant, for many purposes, the silver print. Its permanence is quite certain.

The platinotype process of Mr. Willis displays reactions of great beauty, and is, doubtless, all that its inventor and advocates claim, but it requires rare and expensive chemicals, and cannot be easily extemporaneously prepared by the average operator; it entails much extra trouble in preparing and using the hot developer, and for these reasons will demand much time and persuasion to supersede silver printing. The process, as originally given, called for silver salts and necessarily for hypo for their elimination, but the improved method dispenses with both, and it is therefore the most promising competitor to silver that has yet been proposed.

The new modification to Mr. Perry's process, which I have worked out, requires:—(1) Double albumenised paper; (2) saturated solution of bichromate potash; (3) protosulphate of iron; (4) carbonate of soda (washing soda); (5) gallic acid.

Float the paper on the solution of bichromate, with the albumenized side uppermost, for ten or fifteen minutes, taking care that nothing soils the upper surface. Drain and dry, preferably by radiant heat. When dry it is very sensitive, and must be carefully shielded from the light. Expose under the negative one-third of the time required for a silver print under equal conditions.

From printing frame immerse in a large quantity of pure water for ten minutes. From this time all operations can be conducted in full daylight. Change water and soak as before till every trace of unaltered bichromate is gone. Immerse in a pan containing a solution of protosulphate of iron, twenty grains to one ounce of water, for five minutes. Then place in a moderately strong solution of carb. soda (washing soda) for one-half to one minute. Wash thoroughly, and, lastly, place in the toning bath of gallic acid, three grains to one ounce water. The colour changes slowly up to full purple black, and if the soda detergent has been properly proportioned in strength to the action of light in the printing —*i.e.*, stronger for over-exposure, or weaker for under-exposure—every detail of the bichromate print will be exquisitely preserved, and in any event, the whites of the print will remain perfectly clear, and the paper be unstained. Wash in a few changes of water, and hang up to dry. Should there be any cloudiness of the whites after drying, the print may be again treated with a weak solution of soda with advantage.—*The Beacon*, Chicago.

Hackney Photographic Society.—The annual soirée of this Society is announced for the 21th inst.; this will conclude the first year of the Society's work.

The Calcutta Photographic Exhibition.—The *Journal of the Photographic Society of India* states, in relation to the late Calcutta Photographic Exhibition, that the judges have awarded a silver medal to Mr. B. G. Wilkinson, London, for his set of twelve lantern slides, and, in the Indian amateur class, a certificate of honourable mention to Mr. J. W. Wade, Cochin, for his set of fourteen lantern slides.

PHOTOGRAPHIC APPARATUS.

Mr. Eastman is now in London, and has been in this country for a few weeks. With the introduction of the Eastman Co.'s rollable celluloid film has been the advent of several new hand-cameras of the "kodak" type, which all put less tension upon the film than was the case when films supported by paper were alone used. The new kodaks take rectilinear instead of circular pictures; one camera takes a quarter-plate, and another a 4 in. by 5 in. plate. Each camera has two finders, one for use when the plate is vertical, and the other for use when it is horizontal. The camera has a focussing device, and a doublet lens with three diaphragms. The new cameras are made in four sizes, and will carry transparent film enough for either 48 or 100 exposures. For the four sizes of camera, there are but the two sizes of plates already mentioned. The new kodak for round pictures carries a film for 100 photographs, has a fixed focus lens, and one finder.

Mr. Eastman has brought with him from America a new "kodak" for 7 by 5 inch plates, which camera at some future time will appear in commerce. It carries enough film for forty-eight exposures, and has a lens of six inches focal length, with a pointer and scale to assist in adjusting the lens to focus. The side of the case containing this camera opens, and falls into a horizontal position, permitting the front and bellows to be then drawn out.

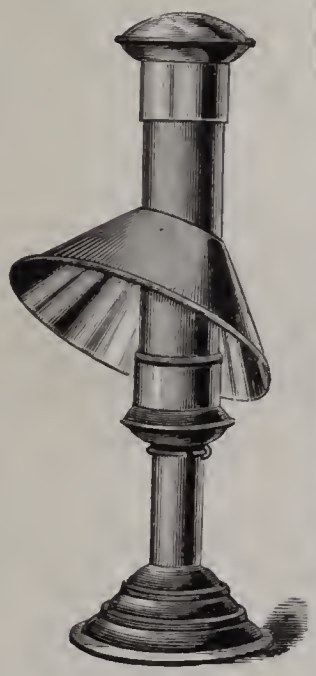

Fig. 1.

Messrs. Mawson and Swan have sent us a specimen of the developing-room lamp shown in fig. 1, the merit of which lies in its simplicity and cheapness. The lower part is a spring candlestick, which keeps a carriage-lamp candle flame always at the same level; above this is a cylindrical chimney of ruby glass, with a conical tin reflector hanging upon its exterior

Mr. J. Fallowfield's "facile" detective camera is not quite new, but has not been previously described in these pages. The instrument has been in public use for some months, and the chief merit of it is its extreme simplicity. The plate-changing arrangement consists, as represented in fig. 2, of two boxes, one above the other, and as the feeding, or upper box, is moved forwards, the lower box travels backwards; thus, when one plate has been exposed, it is drawn backwards; another sheathed plate drops into its place from above, through a slot, and is then brought to focus; and so on until the charge of plates is used up. The shutter of the "facile," which is represented in fig. 3, is also extremely simple; it consists of a light, fan-shaped piece of metal with a curved aperture near the top; this is pushed backwards or forwards to make the exposure, by either the one or the other of two light rods which project outside the box.

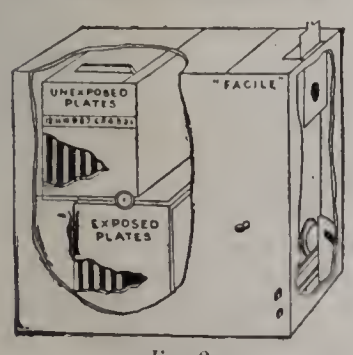

Fig. 2.

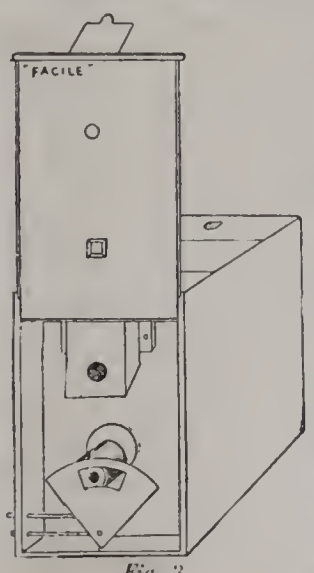

Fig. 3.

Mr. Fallowfield has introduced a light walking-stick tripod stand, represented in fig. 4. When the walking-stick has closed, it carries a long tubular top or lid. When this tubular top is drawn off, and turned bottom upwards, it will screw on the top of the tripod, and thus add to its height; by this ingenious method, which was invented by Mr. Baker, of Wallington, a fairly high stand can be closed to form a walking-stick of but moderate length. Mr. Fallowfield asks us to announce that before long he will move his establishment to new premises in Charing Cross Road, London.

Fig. 4.

Messrs. Skinner & Co. have exhibited to us a camera, fitted with an appliance, represented in fig. 5, by which the bellows can be racked out with much greater speed than usual. A toothed wheel, instead of the usual milled head, is fixed at each end of the pinion, and has a folding handle by which it can be grasped by the fingers. Several teeth of this wheel bite the rack at once, so give steadiness of motion, and the large diameter of the wheel, which is about that of the ordinary milled head, causes the bellows to be expeditiously racked out. The camera has also a fine adjustment.

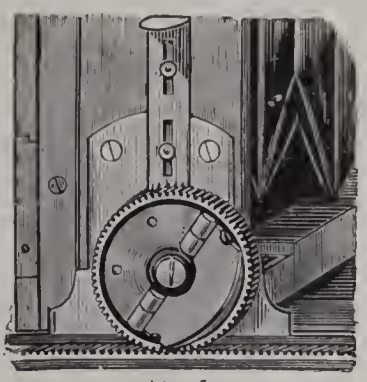

Fig. 5.

A paper in the *Bulletin de la Société Chimique de Paris*, by W. Spring and M. Lucion, says that manganese peroxide should not be represented by the formula MnO_2, but by Mn_2O_4, and it is very probably a manganous manganate MnO, MnO_3, or a manganese permanganate $Mn_2O_7 3MnO = 5(MnO_2)$.

A Detective Pencil.—"Our Celebrities" gives the following account of Mr. Harry Furniss's method of seizing points for caricatures:—"I take them how, and when, and where I can. I never let my victims know I am on their trail. Sometimes they are riding in the park, sometimes they are just getting into a train, or they are chatting to a friend in the lobby, or fast asleep in the House during some very dry debate. It doesn't matter to me; all I strive to avoid is the conventionality of a photograph. You see, a photographer may often lose all the salient points which go to make a man's individuality. I seize them all, and the result is that, in nine cases out of ten, I will produce by far the best likeness. But, mind you, it isn't always easy work, even with the same men."

THE PHOTOGRAPHER OF THE FUTURE.

While not fully sympathizing with those who write and talk about the alleged state of degradation into which photography has fallen, we are aware that it is low enough to make thoughtful photographers anxious, although it does not appear to deter the thoughtless from entering the ranks in numbers altogether out of proportion to the increase of the population, or the enhanced demand which may be expected from increased culture. In every large city, and in many of the smaller ones, too. there are men who do excellent work and get fair prices for it, but it must be confessed that they are but a few among the many; while the rank and file, or at least a large proportion thereof, can command little more than a trading profit on the material employed, which too often, alas! is really more than it is worth.

The alleged causes of this unfortunate state of matters are perhaps as varied as the men who proclaim them are numerous, but a careful consideration of the question will resolve them all into one—over supply. Photography in its trade aspects is not different in any essential feature from other trades, and is influenced as they are by the relation of supply and demand, and while, to a small extent, the former may create the latter, the effect will be small indeed compared with the influence of the latter over the former.

The cheapest of the so-called "cheap Johns" is neither the knave nor the fool that he is sometimes represented to be. He is simply a tradesman who has embraced a calling the members of which are already too numerous, and realizes the fact that wherever there are more workers than work, the work will go to the worker who offers the greatest inducement to the employer. In the case of the photographic worker the possible inducements are only, or mainly, two—better quality than the average, or lower price. Improvement in the quality or style of work is frequently, perhaps generally, beyond the reach of "John," and he knows that although it were not, the public, or a large proportion thereof, are not yet sufficiently cultured to appreciate it, and so has recourse to the other alternative, and reduces his prices to attract work that would not come to him without such reduction. In other words, the photographic labour market is overstocked, and so long as the trade aspects of photography bulk as largely as they do at present in the practice of the art, the man or body of men, by whatever high sounding title they may assume, that promises to cure or even ameliorate this unfortunate state of matters by secret methods, or methods other than those that may be legitimately applied to ordinary commercial transactions, should be disregarded as but sounding brass and tinkling cymbals.

In the good old days, when the practice of photography was profitable, and technical excellence not so easily reached, the portals by which the business was entered were either the good and time-honoured apprenticeship, by which the pupil agreed to give four or more years of labour, in return for which the master became bound to initiate him into all the mysteries of the craft; or by the payment of a tolerably large sum for the required practical instruction, followed by much patient and persevering practice, until the difficulties and uncertainties of the various processes had been overcome. Both of these methods of preparation for the life work were costly, and involved the ability to spend a considerabls portion of unprofitable, or rather unpaid for, time, and consequently the additions to the ranks were rarely in excess of the work waiting them. Then, too, the general public were less critical and more easily satisfied, looking on a photograph as simply a photograph, and considering the productions of one man just as good as those of another; so that the hands of a favoured and abler few were not, as now, crowded with all that they could do, while the visitors to the many were and far between.

All this is changed now. The introduction of the dry plate and simplification of the various processes have made the acquirement of the ability to make photographs sufficiently good to please a large portion of the community an easy matter; and the cost of apparatus that will, at least, answer the purpose has been so much reduced that any one of average ability may, and hundreds during the last year or two have, after a little reading, or a few practical lessons, started as full-fledged photographers, and thereby doubled, or perhaps trebled, the number of professional photographers actually required to do the work of the country.

But there is nothing either morally or legally wrong in this. In a free country the practice of trades and professions is open to all who care to qualify themselves, and although, in the case of professions involving the life or property of the people, the State justly steps in and demands evidence of the qualifications of the candidates for admission, the public are with equal justice left to judge for themselves of the ability of those who seek only to minister to their necessities in connection with trade, commerce, or art; and our friend "John," in trying to attract sitters to his studio by reducing his prices, is as clearly within his rights as a citizen of a free country, as are Lehmann of Chicago, or Wanamaker of Philadelphia, in advertising that they will furnish the public with crockery or clothing at prices lower than their neighbours.

It should be observed that the question is not as to the quality of the articles supplied, but as to the rights of the parties to supply such articles at such prices as will please themselves and the public. It may be that the articles supplied by the magnates of Chicago and Philadelphia and the "John" brotherhood throughout the land are not quite equal to those dealt in by higher-priced dealers, but as the magnates in question, and some at least of the "John" family, have amassed tolerably large fortunes, we may fairly presume that they are not the round men in the square holes.

The sum of the matter, then, is this:—A certain degree of proficiency in the practice of photography is easily attained, and, consequently, the ranks of professional photographers have been increased far beyond the requirements of the people.

The value of this excessive labour has, in accord with the inevitable laws of supply and demand, been so reduced in value, as to have inflicted great hardship on considerable numbers, and changed the practice of photography, in all but the hands of a favoured few, from a highly profitable to a poorly paying profession.

This being the true state of matters, is there any remedy, or possibility or probability of amendment? We think there are two movements, which, working together, may effect a cure, and restore the professional practice of photography to even a higher degree of prosperity than it has heretofore attained—the education and cultivation of the public taste and appreciation of art, and the higher education, technically and artistically—especially artistically—of

the photographers. We have already said that in many of the larger cities, and in some of the smaller ones, there are photographers whose hands are always full, but either from heredity or patient study they are artists in the true sense of the term, and find a *clientele* sufficiently cultured to appreciate their work. Through the spread of education generally, and especially the high-class illustrations in modern periodicals, and the equally powerful influence of photography itself, what is now confined to the favoured few—cultivated artistic taste, and the ability to appreciate true works of art—will become the heritage of the many; and photographs that are accepted by the thousand and paid for now, will then have no commercial value.

This movement is going on now, and will continue to go on, independent altogether of the photographer; but the other to which we alluded must be carried on by himself, or some one for him, and how is it to be done? The question is indeed a difficult one—so difficult that, like the lecturer on temperance, we almost despair of making any satisfactory impression on the old, and would fain devote our attention exclusively and hopefully to the young. The old, the men already struggling with a poorly paying business, will feel the necessary study somewhat irksome; but much may be done by first attempting to thoroughly realise the possibilities of photography, and then resolving to reach the highest, or as high as may be within their power. Careful study of engravings from the men of mark of former and present times, and analysis, line by line, of the illustrations in the leading periodicals, most, if not all, of which may be so studied with profit. Simultaneous with such study should be carried on the careful reading of works treating of art in all its phases, especially its composition and light and shade; some of Ruskin's are good, and Burnet's essays are simply invaluable. This is about all that the older men can do for themselves, and any man who asks them to pay for promises to do more, tries to induce them to lean on a broken reed.

For the rising generation we think there is a brighter prospect, or, at least, for those of them who will truly realize the importance of proper preparation for their life work. But for that preparation proper opportunities must be afforded, and that is a desideratum that can only be accomplished by the united action of those who truly wish to see photography and photographers occupy the high position to which they are, or ought to be, entitled.

It would be impracticable to restore the system of apprenticeship which, so far as ordinary trades are concerned, in spite of all that is said and written of technical schools, is the only method by which trades can be properly taught, and if it were, the masters competent to teach are too few to meet the requirements. But, properly equipped and rightly managed, schools of photography could, we think, be made to answer the purpose. Such a school should contain all the appliances of an ordinary studio, facilities for enlarging and copying of all kinds; a suitably equipped chemical laboratory and lecture room, with accommodation for both theoretical and practical instruction; and models, specimens, and all necessary appliances for the proper teaching of the principles applicable to art.

Those, in the hands of a staff of thoroughly able, conscientious teachers, selected not only for their knowledge of the subjects to be taught, but also for their ability to communicate that knowledge, would form a school from which there would periodically issue a band of young men in every way worthy of the much misused title, photographic artist.

One such school might be established in the principal city in each state, and a central examining board, or one in the East and one in the West, who would, after the passing of a proper examination, confer a diploma, which will be at once recognised by the profession, and in due time by the public, as an evidence of qualification on the part of the holder.

Of course the schools of photography and their influence could not prevent unqualified men from going into business as photographers, but qualified employers would only employ qualified assistants, and, as we said before, the general public is gradually approaching to a state of art culture and appreciation that will not tolerate work that does not come up to a certain standard of excellence. Then, however loudly the untrained and unqualified man may pipe, the trained and appreciative public will refuse to dance.—*The Beacon* of Chicago.

THE PHOTOGRAPHIC INTERNATIONAL EXHIBITION AT AMSTERDAM.

We have just received additional particulars about the photographic exhibition to be held in Amsterdam in the spring of next year. This Exhibition will be international, and for the furtherance of the photographic interest. The societies principally concerned in it are the Helios, or Dutch Union of Dilettante Photographers, and the Amateur Photographic Union of Amsterdam. The committee is under the presidency of J. G. van Gelder; and has for its treasurer D. von Bosse, and its general secretary A. Scheltema Beduin. The local secretaries are:—For France, H. v. d. Masch Spakler; for Germany, A. D. Loman; and for England, C. H. Grook.

The Exhibition, which is open to all nations, asks support from all. Its object is to make professionals and amateurs practically acquainted with the latest photographic inventions and discoveries. Medals will be awarded for the best work sent in. A programme will shortly be published, giving further and more detailed information. In the meantime, all persons interested in the Exhibition are desired to apply to Mr. A. D. Loman, Jnr., 157, Warmoerstraat, Amsterdam.

CRYSTAL PALACE EXHIBITION.

The following are the additional awards at the Crystal Palace Exhibition:—

Silver medal given by Mr. S. G. Buchanan Wollaston for the best picture, irrespective of class, in the amateur section, not having taken any other award in this Exhibition: awarded to Paul Langé for 1,431 ("A Tour in Norway").

Silver medal given by Mr. J. F. Peasgood for the best picture, irrespective of class, in the professional section, not having taken any other award in this Exhibition: awarded to F. Whaley for 1,146 ("A Tale of the World").

Special silver medal for picture not previously shown at a public exhibition: awarded to E. C. Middleton for 414 ("Gossips").

Lantern Section.

Bronze Medals.—Professional (sets of 48 slides):—Section 1, British Subjects, J. Dove; (2) Foreign, G. E. Thompson: (4) Microscopic, F. Evans; (5) Statuary, Sciopticon Co. Amateurs (sets of 6 slides):—Section 1,

British Landscape, F. Griffiths; (2) Foreign Views, A. Heywood; (3) Seascapes, F. W. Wade; (4) River and Lake, J. E. Austen; (5) Architectural (exterior), E. A. White; (6) Architectural (interior), J. A. Sinclair; (7) Still Life, J. Carpenter; (8) Animals, K. L. Reynolds; (9) Figures in Motion, H. Little; (10) Microscopic, A. A. Carnell.

The attendance at the 1890 Exhibition has beaten the record of previous years by a considerable number.

THE FOAMING OF CERTAIN LIQUIDS USED IN PHOTOGRAPHY.

Last Friday night Lord Rayleigh lectured to a full house at the Royal Institution on "Foam." He remarked that he intended the title of the lecture to be "Froth," only friends had represented to him that "foam" was more poetical. Pure liquids, he said, will not foam: those which do so are essentially dirty or contaminated with other substances, and he illustrated this point with several liquids used in photography. Pure alcohol will not foam, but water containing five per cent. of alcohol exhibits a stronger tendency to foam than would otherwise be the case. Glacial acetic acid does not foam; when made weaker it foams more, and a ten per cent. solution of it shows a much stronger tendency to foam. Some samples of ether, when mixed with water, will cause more foaming than others when similarly treated, although the proportions be the same in all cases. That was the case with two samples before them from the laboratory downstairs. Both samples were sold as absolutely pure. Why one of them should set up in water the tendency to foam more than the other he did not know; perhaps one of them contained a trace of grease. Three parts of gelatine in 100,000 of water favours the formation of foam in large bubbles, and saponine acts even more strongly. A strong solution of pure salt does not foam much. He believed the foaming of the sea to be due to something extracted from seaweeds in rough weather.

The rest of the lecture bore no relation to photographic subjects. Sir Frederick Bramwell presided.

Patent Intelligence.

Applications for Letters Patent.

10,393A. J. T. Fairfax, 433, Strand, London, "Photographic Films. (Frederick Crane, United States). This application having been originally included in No. 10,393, dated 26th June, 1889, takes, under Patent rule 23, that date.

4,581. T. Samuels, 53, Chancery Lane, London, "Camera Backs or Slides."—March 24th.

4,592. H. T. Parfitt, 55, Chancery Lane, London, "Kilns for Firing Enamel Ware."—March 24th.

4,606. J. Leslie, 2, Somerset Terrace, Belfast, "Photographic Flexible Films."—March 25th.

4,610. G. Newsum, Bradford, Yorkshire, "Apparatus for Applying Bronze and other Powders."—March 25th.

4,622. Friese Greene and F. H. Varley, 92, Piccadilly, London, "Improvements in Photometers."—March 25th.

4,666. J. C. E. Carre, 53, Chancery Lane, London, "Cameras."—March 25th.

4,701. F. H. Varley, 82, Newington Green Road, London, "Improvements in Cameras for Photographing Objects in Motion."—March 26th.

4,863. F. W. Branson, 14, Commercial Street, Leeds, "Lighting Developing Rooms."—March 28th.

4,881. G. H. P. Burne, 19, Bowling Green Street, Leicester, "Photographic Shutters."—March 28th.

4,914. W. Crosland, New Street, Miles Platting, Manchester, "Making a Rough Surface on Paper."—March 29th.

4,918. S. M. Hancocks, 419, Glossop Road, Sheffield, "Stand for Photographs."—March 29th.

4,956. Friese Greene and F. H. Varley, 92, Piccadilly, London, "Photographic Printing Apparatus for Producing Copies at a Rapid Rate."—March 29th.

Specifications Published.

6,264. *April 12th*, 1889.—"Cutting Screw Threads." William Wilson Hulse, Ordsal Works, Salford, Lancaster, Engineer.

Both internal and external screw threads may be cut by means of revolving radial dies moveable towards or away from the axis about which they revolve for the purposes of adjustment, and of setting them up to or withdrawing them from the work as may be required. For cutting external threads, the dies are held in a die box, and are actuated radially by a cam action such as commonly employed. The cam block is rotated by means of a worm (which is by preference made solid with its spindle) and of a worm wheel formed upon the back of the cam block of a smaller diameter than that of the block, in order that the worm and its spindle may be accommodated without increasing the diameter of the die box for the purpose. The die box is formed or secured upon a spindle, which is by preference made hollow, and is mounted in bearings in a headstock secured upon a bed. Sometimes the dies may be arranged in pairs, one of each pair cutting when the die box rotates in one direction, and the other when it rotates in the opposite direction. The work is secured in a vice which is adjustable along the bed, and which holds the work by means of gripping dies operated similarly to the cutting dies, and with a similar arrangement of worm and worm wheel. While the threads are being cut the work remains stationary, and the cutting die box and spindle have an endwise as well as a rotary movement, the endwise movement corresponding to the advance of the cutting dies along the threads they are forming.

6,963. *April 26th*, 1889.—"Securing Glass Sheets in Roofs." Alexander Drummond, 35, Montrose Street, Glasgow, Glass Merchant.

This invention relates to and is a further development of my prior invention for glazing structures No. 5,947, dated 21st April, 1888.

In securing the glass sheets in roofs of structures in accordance with this invention, I entirely dispense with the use of astragals or glazing bars.

The glass sheets are placed edge to edge, or they may overlap, and are fitted at their upper ends into grooves or recesses cut longitudinally in the purline bars. The meeting edges of the glass sheets are covered by narrow strips of glass, metal, or wood, which are, at their upper ends, either entered into recesses in the purline bars, or are held in position by forked shaped catching devices, which may be of cast or stamped metal having projections on them capable of being driven into the purlines to secure them in position, or they may be secured thereto by screwing or otherwise. The lower end of each of said narrow strips of glass is held firmly in position by a stop piece, which is secured to the purline bars by screwing or otherwise. Gutters for carrying off moisture are cut in the upper sides of the purline bars.

The stop piece, as described in my prior specification, consists of a clip or cover which is dovetailed into a rectangular or other shaped base plate secured to the purline bars. Under this invention the head of this clip or cover has two arms or projections on it, so made as to grip the glass strips and prevent lateral movement.

The stop piece, instead of being made as described in my prior specification, may be made of a base plate or piece having a thick part at one end through which a hole is bored or made; over the thickened part the clip or cover is fitted by a pin passed through a hole in each of the sides of the clip, and through the hole in the thickened part of the plate; or the clip may be hinged to the base plate, the hinged part folding over on top of the glass, and being held in position by

a pin passed through a projection on the thickened end of the base plate. In some cases the clip itself may be narrowed at one end, and may pass through, and be secured in a hole made longitudinally in the thick part of the base plate ; or the clip may be dovetailed over the thick part of the plate.

In lieu of making the base plate thicker at one end, it may be bent upwards or stepped instead, and the lower end of the clip be made to slip over or to be bent over the raised part.

Under another modification the clip may have projections at its under side which will fit easily into recesses or holes, or their equivalent, made in the clips ; or *vice versa*, the clips may fit or slide on projections made on the base plate. The base plate and the clip would each have preferably, in all cases, arms for gripping and holding the glass strips in position.

When the glass sheets overlap each over a different sort of stop piece from those hereinbefore described would preferably be used. This stop piece has only one arm on one side of both the clip and base plate, and the base plate is further provided with a raised projection or ridge to prevent the under sheets of glass from moving laterally.

Instead of being secured by stop pieces as hereinbefore described, the narrow strips of glass, metal, or wood, may have flanges or projections made on them which would fit into or catch on corresponding grooves or projections made on or in the glass sheets. In some cases the narrow strips may be T shape in cross section instead of as hereinbefore described.

Strips of tarred cotton, felt, or canvas, may, if desired, cover the meeting edges of the glass sheets, and on this the narrow locking strips may be laid.

In some cases the narrow locking strips may be underneath the glass sheets instead of above them.

My improvements, besides being used for glazing purposes, are equally applicable for securing corrugated metal roofing, tiles, slates, and sheet metal roofing in position.

Proceedings of Societies.

The Camera Club.

Thursday, March 20th.—Capt. W. de Abney in the chair.

Mr. Chapman Jones exhibited his "memorandum camera," which has already, to some extent, been described in these pages. He said that it could be used all the year round, and at any time of day, and under very different circumstances, for the lens worked at *f*/4, which enabled the user to overcome the disadvantages of bad light. The lens was a portrait one, by Swift, and had a focal length of 3½ inches, and the camera had a roller-blind shutter next the plate, giving an exposure of about one-twentieth of a second, but it could be tightened so as to give, perhaps, one-sixtieth of a second. Farther, by a modification of the conditions, it became possible to give an exposure of one-tenth the duration of that employed by Anschutz, and to obtain which he used an 800 lb. weight. The memorandum camera carried a plate of half the size of a quarter-plate, and as the latter are always in the market, there is no difficulty in getting them and cutting them in two. The camera was fitted with a finder.

Mr. Ferrero exhibited a contrivance to facilitate the taking of lantern slides from negatives.

Mr. George Davison exhibited some photographs by Mr. Corbould, showing the distortion produced in portraiture by wide angle lenses.

Mr. W. Willis then read a paper on "Platinotype Possibilities." He began by speaking of the mixed oxalate and phosphate developer for the hot bath process ; with these salts in the bath, the initial image is less rapidly dissolved from the paper, so that the developer has longer time to act, and there are extra crispness and definition in the results, with more clearness, brilliancy, and transparency. The print should be removed from the bath the moment the shadows have sufficient density, and be at once placed in the acid bath. The phosphatic salt used is the monopotassic orthophosphate. At a temperature of 120° F. this bath gives excellent results, but for hard negatives the heat should be increased. In the course of his remarks, Mr. Willis said that the object of the final washing of platinotype prints was to remove the last traces of acid, which otherwise, in course of time, might attack the paper ; therefore, the washing should be ample to clear all acid from the fibres, and it was better that a little alkali should be added to the last washing water. Few papers in the market were suitable for platinotype work. Among the prints he exhibited were some on rough paper ; they presented, he said, but slight loss of definition, and he did not know that the results were more artistic than on smooth paper. The rough paper required exceedingly careful handling in the various baths, in which also they must not be allowed to rub against each other, or the image would be taken from the tops of the minute hillocks of the paper. The prints before them, on strongly wire-marked superior writing paper, were remarkable, he stated, because of the surprisingly small way in which the wire-marks interfered with the general appearance of the pictures. Other of the prints before them presented beautiful results with certain subjects ; they had been taken upon an exceedingly strong and thin paper, namely, that used for bank notes. The image went right through the substance of this paper, and the beauty of the results did not become apparent until the prints were mounted upon pure white cardboard. Other prints before them were upon nansook, a fabric made entirely of cotton ; one of them—a snow scene—was marvellous in its intensity ; he had never seen it surpassed, and the intensity increased the stronger the light in which it was viewed. He thought that nansook gave the ideal surface, for it rendered both ends of the scale and nearly every gradation between them. The next material, sateen, was also all cotton, and such faults as were in the prints he thought to be due to that material ; the results were nearly but not quite so good as those upon nansook. Linen worked well in the matters of ease and of certainty in results, and he thought that it gave better definition than the other two substances ; the platinum pigment seemed to attach itself very strongly to linen. He knew a man in America who printed in platinum the likenesses of his lady-loves upon his shirt wristbands—he "wore his heart upon his sleeve," so to speak—

Captain Abney interposed "His sweethearts, you mean."

Mr. Willis continued that the man told him that his shirts had been washed twenty times by Wah Sing, yet the likenesses were as good as ever. He (Mr. Willis) knew the able Chinaman, Wah Sing, and the way he smashed buttons during his energetic washing of shirts was amazing. Other prints before them were upon silk ; it was a troublesome material in the platinotype process, and he could not say that his results were very successful ; the results were better when the silk was not pure, but contained a certain amount of cotton. The prints on nansook looked very bad while they were wet. The prints he had shown that evening on fabrics had all been brought out by the cold bath developer. In working the platinotype process with ferrous salts, they would find that the addition of a very little ferric oxalate had a powerful restraining effect. To mount the fabrics on card, he used a stiff cold jelly, applied thinly, and consisting of mixed starch and gelatine.

Captain Abney asked about the sizing of the fabrics.

Mr. Willis replied that those before them had all been absolutely unsized. The papers were sized with arrowroot.

Mr. Asbury Greene asked if the fabrics could be developed by applying the solution with a brush ?

Mr. Willis replied that it might be easily done without leaving marks ; he had tried the use of a spray-producer, but the results were disappointing ; the liquid then seemed to settle on the surface in fine drops which did not coalesce, so that a kind of mottled appearance was the result. A brush, to answer well, must be broad enough to cover the whole plate with one sweep, and must be charged with an amply large supply of the developer ; it must be a self-feeding brush.

Mr. F. de P. Cembrano, Jr., asked if ferric oxalate could be so used as to save an over-exposed print ?

Mr. Willis replied that it was a bad restrainer, because its action seemed to be so irregular.

Mr. Elder liked warm-toned platinotypes. Once, when using the hot bath process, he wished to prove to some pupils how damp injured the sensitive paper; he cut a print in half, and placed it over a sink for several hours. To his astonishment, the part of the print which had been made damp developed better than the other half. Once he had been engaged on some experiments in the dyeing of silks, and found that whenever a mineral dye was applied, the silk lost its lustre. The fabrics he employed were those known as "liberty silks." This destruction of lustre might help to explain the difficulties of Mr. Willis with silks.

Mr. Humphery had found maps on linen to be excellent when bicycling.

Captain Abney remarked that some years ago, when he was in charge of the Photographic School at Chatham, there was a case of preparing for war—he would not say with what country—and the War Office wanted copies of maps for use in the army. He thought that such maps must be useless for such a purpose if printed on paper, so he turned them out on linen by means of a special lithographic ink, and, on trial, it was found that they did not suffer by exposure to weather and rain in the field. He mentioned this to show that the War Office was well aware of the value of maps upon linen.

Mr. J. B. B. Wellington stated that once he had a sample of platinotype paper which gave flat images, and that when he put a little gelatine in the oxalate bath, he obtained better results; too much, however, must not be added, or it will coagulate on the surface of the paper.

Mr. Chapman Jones suggested that perhaps the gelatine filled up the texture of the paper, and made it more transparent.

Mr. Lyonel Clark had experimented mostly with silver salts; but there was an analogy between silver and platinum printing, as exemplified by the results shown that evening. The fabric which had given him the most pleasing results was satin jean, which he had sized by means of dextrine; this kept the print on the surface, just where it was wanted, and the dextrine afterwards dissolved off in the washing baths. The silk used by Mr. Willis was strongly ribbed; he thought that the French silk used in the manufacture of fans would answer better. When prints on fabrics were to be small, he mounted each piece of fabric on paper with dextrine, and kept the print on its paper support through all the solutions. As a mountant, he applied starch to the mount, and, when it was nearly dry, he placed the print in position upon it, then ran the two through the rolling press. A great advance had been made in the adoption of the platinotype process during the past few years, and he was glad to see that of the large number of prints adorning their walls that evening, only five or six were photographs by the silver process on albumenized paper.

Mr. Willis had been specially interested in what Mr. Elder had said about the action of mineral dyes upon silk, for he thought that it explained some of the phenomena which he had seen. Mr. Wellington's experiment was of interest; he had tried it himself and had failed—perhaps from using too much gelatine. Gelatine combines with platinum over the whole image, so perhaps a small proportion of it in the oxalate bath gives the developer more time to act, by preventing the ferrous salt getting away before the completion of its work. After a fabric has been sensitised by ferric oxalate, it became so brittle as to be not easily distorted in the printing frame when the size of the print is not too large; under such circumstances he had never failed to get registration after examination. Mr. Davison had just handed him some samples of Japanese paper which had been sent to the former by Mr. W. K. Burton. He (Mr. Willis) had found that it was possible to sensitise Japanese papers, but that the difficulty was great—so much so, that he had given up the attempt, although, on occasions of success, the results were very lovely.

Southsea Amateur Photographic Society.

A public lantern exhibition was given on the 26th ult. in the large Victoria Hall, Southsea. The entertainment was in every way highly satisfactory. A fine collection of pictures, representing Canadian, Scotch, and English scenery, with various genre studies, and some good cathedral scenes, were thrown on the screen by Lieut. Gladstone, R.N., and a short description of each picture was given by Lieut. Cobb, R.N. There was a large and appreciative audience. The slides were entirely the work of members of the Society, prominent among whom were Capt. Lamb, Lieut. Gladstone, Dr. Wardrope, and Messrs. Thornton and Leaventhorpe. The arrangements were under the direction of Dr. F. Lord and the committee.

Photographic Society of Philadelphia.

A meeting of the Society was held on March 5th, President Frederic Graff in the chair.

The Secretary read a communication from the President of the Welsbach Gas Light Co., announcing that the company had fitted up a room at their factory for photographing with incandescent gas light, and inviting the members to make use of the room, and to visit the factory and witness the production of the light.

Mr. Stirling, chairman of the Lantern Slide Committee, reported satisfactory progress in the preparation for the exhibition to be held subsequently, and the prospects of a fine display of representative work of the members. Mr. Stirling also announced that forty-three English slides, representing the Society's share of the hundred sent to this country by the Camera Club of London on account of the last English interchange, had been received. They had been selected by lot impartially, and after the meeting would be distributed in like manner to the ten members whose slides had been selected to send abroad. Mr. Stirling stated that hereafter the Interchange slides to be sent abroad would be simply loaned, the idea of permanent exchange having been abandoned, so that eventually each member would get back all slides lent for interchange.

Mr. Bell presented a paper on "Gelatine Emulsions." In introducing the subject, he said he thought that it was the late president of the Society, Mr. Bates, who was first in this country to bring into use the gelatine plate. In his frequent trips to Europe, Mr. Bates had had Mr. Kennett prepare some of them, and they were brought over. It was a long time before Mr. Bell had heard of anybody using them here. The next one he heard of making emulsions was Mr. George W. Hewitt. He, himself, had also been more or less engaged in investigating gelatine emulsions. The next one that was successful was Mr. Carbutt. Not having himself been successful, he did not claim anything.

Mr. Bell then proceeded to read his paper, which, he said, was the result of a good many years' experience. At the conclusion of the reading, Mr. Bell said that if any of the members were "chemically inclined" he would ask them to take the No. 1 formula, and test it to see if it was what he claimed for it.

Referring to the sensitiveness of plates, Mr. Carbutt asked "What does 10 or 80 mean?"

Mr. Coates.—I think it means the gullibility of the buyer. I have bought "10" plates, and found "20" much better.

Mr. Browne.—Mr. Bell, in the early part of his paper, alluded to Mr. George W. Hewitt's experiments. So far as I know, Mr. Hewitt was one of the earliest experimenters with gelatine plates, and certainly Mr. Hewitt's process, and the results that he succeeded in obtaining, were remarkable. There was one peculiarity about his plates that I have never seen in any purchased plates, and that was, that the appearance of the image was more beautiful than I have ever seen in a commercial plate. The appearance of the image was slow, and remarkably beautiful. I think Mr. Carbutt saw some of them. I do not know that Mr. Hewitt claims anything original in that process, but there was one difficulty in his plates which was a very serious one, and which he was never able to overcome, that was the liability to frill. I used many of his plates, but there was that uncertain character in the matter of frilling which made it to me very disagreeable. I think that in the future Mr. Hewitt will always receive credit as being one of the earliest experimenters in gelatine dry plates.

Under the head of "Verbal Communications," Mr. Carbutt referred to the subject under discussion at the previous meet-

ing—that of deposits on the cover glasses of slides, saying that he had received a number of slides from Mr. Pancoast, accompanied by a letter in which he said, "Referring again to the incrustation on lantern slides, I was looking over some old slides I made in 1883 (possibly 1882) on some of your A plates, and find them in A1 order, no discolouring, mould, or incrustation whatever. They were not varnished or protected in any way, and were subject to the same conditions as the one I showed you at the Society." In another letter of a later date to Mr. Carbutt, Mr. Pancoast wrote on the same subject; "I send you by this mail one of the lot I spoke of in a previous letter, in order that you may see how perfectly it has kept. It was in the same box as the other slides, and subjected to the same conditions as those which show such a marked incrustation. I think the glass is B. P. C., at least the plates were your regular A plates. These slides were made by contact printing, and developed with oxalate."

Mr. Bell called attention to a portion of the report of a previous meeting, in which the words occurred, referring to the use of turmeric for colour screens for orthochromatic plates, "Mr. Bell thought turmeric to be adapted to the work with orthochromatic plates, and was as good as anything." He desired to say that he distinctly stated that turmeric could not be relied upon unless freshly prepared.

Referring to orthochromatic photography, he showed a screen of brilliant yellow, prepared by Mr. Ives, and loaned by him. It was put behind the lens, holding back blue rays, and allowing the yellow to act more strongly on the plate. It was necessary to have a plate specially prepared, as the ordinary plates would not answer. It should be an orthochromatic plate. He showed two glasses in illustration of his remarks, saying that turmeric would not answer.

Continuing, Mr. Bell showed the same colour screens he had obtained in London last year. One was of pot metal, ground and polished like plate glass, and which, he said, would never fade. He had three tints, but finding one was too light, he had cemented two together with balsam of fir.

Mr. Redfield showed a screen similar to that of Mr. Bell's, made by Mr. Ives. He also showed the front board of his camera, and the slide in which the screen was placed. It was a double glass prepared by Mr. Ives. Another method was a circular piece of glass prepared by Mr. Carbutt, which was dropped in the front of the lens, and a strip of blackened leather slipped in front of it, acting as a spring, and keeping the glass in position. Probably an improvement would be the introduction of some springs bracing the plate squarely against the back of the lens, so as to prevent its being at an angle, and thus producing distortion. A still better way would be to coat the surface of the lens with some colouring matter, or have the lens made of some coloured glass, as suggested recently in one of the English journals.

Mr. Cheyney said he had found it utterly impossible to get a sharp image by focussing first and putting the screen in afterwards. If focussing were done without the screen, and then the screen put in, the focus would be altered and thrown back.

Mr. Supplee asked what would take place if placed in front of the lens.

Mr. Cheyney said the change would be very slight.

Mr. Carbutt suggested the preparation of thin films of coloured collodion attached to diaphragms of black cardboard, and used in place of the usual diaphragms.

Mr. Redfield thought that two pieces of thin black rubber could be used.

Mr. Carbutt said that he had suggested cardboard because it could be obtained so easily.

Mr. Bell said that he had already gone over that process, and found the collodion film was too brittle, and curled all up.

Mr. Carbutt said that it was not properly prepared, then. It had a natural tendency to curl, but not to such an extent as to preclude its use. If 5 per cent. of castor oil were put in, it would remain firm.

Continuing the subject of orthochromatic photography, Mr. Carbutt showed some prints illustrating the excellent keeping of the plates, and also a photogravure print made by a publishing house in Boston from a negative on one of his orthochromatic plates. The print was from an old painting, and had a remarkable brilliant quality with correct colour tone.

Liverpool Amateur Photographic Association.

The third ordinary meeting of the twenty-seventh session was held in the Association's Club Rooms, 3, Lord Street, on March 27th; the President, Mr. Paul Lange, occupied the chair. There was a large attendance.

The following were elected members:—Messrs. T. J. P. Masters, H. G. Ponting, William Mason, junior, E. M. Ratcliffe, J. A. Knowles, Oswald Harrison, J. H. Fardon, Dr. E. J. Foulston, and F. H. Dudley.

The President announced that the new Boston slides, entitled "The White Mountains," and Mr. John Hargreaves' lecture on the completed survey of the "Hundred of Wirral," would take place in the City Hall, Eberle Street, on Monday, April 14th.

Mr. Fred Evans was then called upon to explain the arrangements that were being made concerning the Convention of Photographic Societies of Great Britain at Chester in the last week of June, when, amongst other attractions, special facilities, not hitherto allowed to amateurs, would be granted by the Duke of Westminster for photographing both the exterior and the interior of Eaton Hall.

The principal business of the evening was the contemplated Photographic Exhibition of 1891. The President entered very fully into the particulars of the matter; that it should take place in the spring of 1891 for the term of one month; that the offer of the Library and Arts Committee of the Corporation of Liverpool be accepted for the use of the same splendid apartments in the Walker Art Gallery as used in 1888.

The members unanimously decided that such an exhibition should be held. The President called on Mr. T. S. Mayne, the Honorary Secretary appointed for Exhibition matters, who then explained in detail some fresh features which were in contemplation. In due time full details will appear on the prospectus.

The meeting concluded with an interesting exhibition of photographic novelties, of which there were a large collection.

Colonel Ellison explained a new hand-camera, convertible into an ordinary camera, of his own invention, working on an ingenious tripod ball-and-socket arrangement also made by himself.

Photographers' Benevolent Association.

A meeting was held on the 28th March at 4, St. James's Street, Bedford Row, Mr. Bedford in the chair.

The following were elected members:—Misses Barton and Martin; Messrs. Skillman, Gottheil, Farrington, Evans, Plummer, Hinks, and Dr. Roland Smith.

An application for assistance was considered and granted.

Mr. Hanbly was appointed hon. local secretary for Lincolnshire.

Bath Photographic Society.

March 26th. Mr. W. Pumphrey, President, in chair.

Messrs. T. Bush, W. C. Lee, H. Isaacs, and C. G. R. Wood were elected.

The Hon. Secretary (W. Middleton Ashman) read a communication from the Mayor of Sutton Coldfield, anent the Norway excursion promoted by the Vesey Club, which starts in July next.

The Chairman said the Vesey Club desired to associate with scientists of all kinds in this special tour. The arrangements were very complete, and as he should be one of the party, he hoped to report favourably upon his return.

The Secretary exhibited a dark-room candle and reading lamp known as the "perfection."

The following were appointed an excursion committee for the ensuing season: Messrs. Powell, Perren, Tabsley, Collins, and the Secretary. The first outing will take place April 24th. Train 11.25 a.m., G. W. R., to Box and neighbourhood.

The CHAIRMAN stated that the annual report having been printed in full in the *Bladud* newspaper, they had ordered 250 reprints. Copies could be obtained from the Secretary. He wished to correct an error as to date which appeared therein. The publication of Daguerre's process should read 1839, instead of 1840, and it would be more correct to say that the neighbourhood of Bath was the scene of Fox Talbot researches.

Mr. C. H. TALBOT (son of Fox Talbot) said he felt responsible for these matters mentioned by the chairman being sprung upon the meeting, he having spoken to Mr. Ashman concerning them earlier in the day. With regard to date, there certainly was an error in the committee's report. He was not then prepared to say the exact date, but it could be found in the second edition of Tissandier's work. His father made an application for a patent earlier than January, 1839; but, on the 12th of that month, he announced his method of making camera pictures to avoid being forestalled in case Daguerre's process should prove to be similar. This was followed by the paper his father read on January 31st, 1839, before the Royal Society. All these experiments were carried on at Lacock Abbey, thirteen miles from Bath.

The CHAIRMAN having read a passage from Mr. Robert Hunt's book, showing how the error referred to occurred,

Mr. TALBOT said Niepce, in all probability, produced camera pictures earlier than his father or Daguerre.

The CHAIRMAN remarked that the process must have been very slow if Niepce used bitumen for the purpose.

Mr. TALBOT: Niépce's process was very slow. Daguerre's process did not precede my father's; it must have been the other way, otherwise its publication might have been delayed. No doubt he published to protect himself. He (Mr. Talbot) was inclined to think Niépce made the earliest camera pictures. Wedgwood had tried to do so, but he failed.

A lantern exhibition of transparencies, produced by members of the Society during the past session, then took place; Messrs. Pumphrey, Bristow, Peacock, Perren, Powell, Maton, Wells, and the Rev. E. A. Purvis contributed.

Wet collodion slides, toned with potassium sulphide, were shown by the President and Mr. Bristow. The remainder were by gelatine processes, either developed with ammonia pyro, or hydroquinone. An oxy-hydrogen apparatus, lent by the President, was used.

The CHAIRMAN hoped that more members would compete next year, so that all might have an opportunity of seeing each one's work. Upon the whole he thought they had a very satisfactory display of a variety of subjects. It was interesting to note the different treatment these subjects had received at the hands of the members.

PHOTOGRAPHIC SOCIETY OF IRELAND.

ON Thursday, the 27th March, the monthly technical meeting was held, Dr. J. A. SCOTT, M.B., Vice-president, in the chair. After two new members had been balloted for, the evening was devoted to exhibiting such lantern slides as the members had brought down with them, and some pictures were put upon the screen, and elicited discussion as to the various conditions under which they were produced.

After the lantern exhibition, Dr. J. A. SCOTT showed Tylar's lanternscope, an apparatus designed for placing upon a table for the purpose of viewing lantern slides, and explained its working.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Thursday next, April 10th, will be the last lantern meeting this season. A special feature will be the exhibition of slide carriers and slide changing apparatus.

FROM Messrs. Gauthier-Villars we receive the tenth part of the second volume of Ch. Fabre's "Traité Encyclopedique de Photographie," which is being issued in parts on the 15th of each month. The number for March treats, among other matters, of phototypic negatives on flexible films, and negative retouching, not only in portraiture, but in landscape work.

F. IVES.—We will attend to your letter next week.

Answers to Correspondents.

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

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

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

COCOA.—The details of *Obernetter's Photo-Engraving Process* will be found in the NEWS for 1884, p. 67, and for 1885, p. 159. It is there stated that a gelatino-bromide transparency may be employed, the film of which is converted into chloride of silver by a mixture of perchloride of iron and chromic acid, or your method of sulphate of copper and common salt, or any other solution capable of converting the metallic silver into chloride. This altered film is then stripped, and laid down upon the copper surface, which gradually becomes etched, especially if moistened with a solution of chloride of zinc. The process is expedited by backing up the film with any conducting surface, and attaching the positive wire of a voltaic battery with the metal to be etched, and the negative pole to the aforesaid conductor at the back. Mr. Pearson's modification (p. 159) consists in the use of zinc plates instead of copper, when no battery current is required. The transparency should be produced on a gelatino-bromide film containing a minimum of gelatine, so as to be heavily charged with silver.

W. J. W. (Hull).—*Grained Metal Plates for Photo-Engraving.* These may probably be obtained from Mr. J. J. Ayling, 12, Crane Court, Fleet Street. If not procurable from that quarter, try the method of getting a stippled surface by photographing your subject behind a wire gauze screen, or even by indenting the metal plate by powerful pressure against a bed of wire gauze.

KATIE.—*Spotting Unmounted Prints.* Indian ink will, of course, get washed off when the prints are mounted, but we are not acquainted with any medium which could safely be employed without risk of revealing itself at the time of mounting the prints.

C. T. S.—*Vegetable Parchment.* The proportions are two parts by measure of oil of vitriol to one part of water, allowed to become quite cold, and then the blotting paper immersed. As soon as saturated, remove and wash quickly in a large bulk of water. Fine cambric may be treated, but calico does not answer so well. We doubt whether you will succeed with cotton tape, or any closely woven fabric.

E. G.—*Bar of Solder Fallen into the Nitrate Bath.* Some of the silver will doubtless be reduced, and the tin partly oxidised, but only lead dissolved. Filter off and use the solution for a printing bath, either concentrating it, or strengthening by addition of more nitrate of silver.

M. P. S.—*Cyanide for Reducing Albumenized Prints and Taking out the Silver.* There is a misprint in last week's report, page 250, second column. "Half a grain to the ounce," should read half a grain to the *pint* of water. Even with this highly dilute solution the prints will suffer if left in longer than a minute or two, unless they were originally much over-printed.

L. M.—*Incandescent Gas Mantles* (Welsbach system.) Enquire for further particulars at the office, 45A, Piccadilly, W.

CAMERA.—Either your No. 1 or the "Acme." Aluminium fittings make it still lighter. We should advise you to try *b*, with the special contrivance for holding it flat, which Mr. England indicated at the last technical meeting of the Parent Society. See the NEWS, p. 251.

A. W.—*Platinotype.* Received at the moment of going to Press; we will answer your enquiries next week.

R. B., and other Correspondents, in our next.

THOMAS WEDGWOOD.

P[illegible] F[illegible] E[illegible] 1802

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THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1649.—*April* 11, 1890.

CONTENTS.

ALUMINIUM IN PHOTOGRAPHIC APPARATUS.

THE dream of half a generation ago of the advent of the time in which aluminium should be used, not alone for lens mounts and the screws of cameras, but for the cameras themselves, now seems likely to be realised within a moderate period, for aluminium has been steadily falling in price, and at the present time can be bought, of good quality, at fifteen shillings a pound, and of superfine quality at twenty shillings a pound. Worse qualities can be had at eleven and thirteen shillings per pound. The lower the quality of the metal the more brittle it is, and the more likely to be attacked by various chemical reagents. There are rumours in commercial circles that aluminium before long will fall in price to about six shillings a pound, but whether there is any substantial foundation for the report we do not know. Deville, when he was making it years ago, at the cost of about forty shillings a pound, calculated on theoretical grounds that the day was likely to come when it could be sold at about seven shillings a pound. He attempted to turn it out on a large scale under the encouragement of Napoleon III., who hoped thereby to lay the foundation of a new great manufacturing industry for France. There seems to be no chance of its ever falling so low as brass in price for equal bulks, although aluminium, weight for weight, occupies about three times the space of brass. Bad brass can be bought at sixpence a pound, good at between eightpence and tenpence, and the alloy of copper and tin known as gun metal, at fourteen pence a pound.

The necessary extra cost of aluminium fittings, even at the present price of the metal, and with the difficulties incidental to its working, is not a serious question in relation to their introduction into tourists' photographic apparatus for the lightening of the weight thereof, and perhaps if aluminium milled heads were now in the market to replace those of brass, there might at once be a steady demand for them.

In addition to the two or three large London photographic apparatus firms which, as already stated in these pages, have begun to turn their attention to aluminium, Messrs. Perken, Son, and Rayment tell us that they have been experimenting with it for some months; they find it difficult to turn, and that screw-threads on it are difficult to make, and in such operations they lubricate it with soap. They find it to work well under the file, and state that one sample they have been trying has been alloyed with a slight proportion of other metal or metals.

From the Alliance Aluminium Company we have received some interesting information about aluminium, including the following table relating to the properties of various metals :—

	Specific Gravity.	Weight per Cubic foot lbs.	Melting Point Fahrenheit.
Aluminium	2·56	160	abont 1600
Antimony	6·72	420	,, 810
Zinc	7·	437	,, 736
Iron	7·23	451	,, 2786
Tin	7·29	455	,, 442
Steel	8·	499	,, ——
Copper	8·6	537	,, 1950
Bismuth	9·82	613	,, 495
Silver	10·47	654	,, 1873
Lead	11·36	709	,, 612
Mercury	13·60	849	,, ——
Gold	18·41	1150	,, 2100
Platinum	21·53	1344	,, 3080

The Company also furnishes the appended information about casting aluminium :—

The melting point of aluminium is abont 1,600° F. The melting is best performed in a plumbago crucible, but an earthenware crucible may be employed; no flux should be used, and only part of the charge be melted at a time, and added to little by little. The pieces to be melted should be dipped in benzine previous to being put into the crucible. In melting the metal the heat should be raised very gradually to the melting point, which it should not at any time much exceed. Aluminium can be cast either in metallic moulds or in sand. If in *metallic* moulds, the moulds should *first* be heated, and coated with an air-expeller, then thoroughly dried and warmed before using. If in sand, care should be taken that the mould be dry; in either case the moulds should be provided with many vents. The metal should be poured quickly, and a suitable allowance made for shrinkage.

The Allianee Co. gives the following instructions for plating aluminium :—

In order to plate aluminium with gold, silver, or other suitable metal, it is necessary first to cover it with a firm coating of copper, to obtain which the following process is recommended :—

Dissolve a certain quantity of copper-sulphate in distilled water, and add another solution made by dissolving potassium-cyanide (60 to 65 per cent.) in water. A green precipitate will appear, which dissolves by adding more of the cyanide solution ; then add a little potassium-cyanide of 90 to 95 per cent.; this may be continued until the blue colour of the liquid has completely disappeared.

The solution thus prepared will generally be too strong, and it should, therefore, be diluted with water until it indicates 20 per cent. Tw. = 11 sp. gr. This solution will only answer well if used at a temperature of 10° Celsius, care being taken that the aluminium is thoroughly cleaned immediately before immersing it. The current must be regulated in such a manner that only very small bubbles appear on the aluminium ; as soon as the bubbles get too large the coating becomes imperfect, and the current has been too strong.

After obtaining a perfect coating of copper in the manner described, it may be brushed, or polished, or simply dried ; the articles may be silvered, gilt bronzed, or brassed in the ordinary way. For obtaining a second *thick* coating of copper, use the acid solution of copper-sulphate, containing a little tartaric acid, instead of the sulphuric acid commonly employed.

For polishing aluminium the appended instructions are given :—

Equal weights of olive oil and rum are shaken in a flask till emulsified. Dip the burnisher in this mixture, and do not press heavily on the metal. To clean a soiled surface, dip the object in benzine, and dry in fine boxwood sawdust. Olive oil and pumice make a good grinding mixture for hammered or pressed objects before polishing.

Next we come to the methods of mixing aluminium with steel or cast iron, for an exceedingly small proportion of it in either of these improves its quality exceedingly.

The proportion for steel is 0·01 to 0·2 per cent.; for iron, 0·1 to 0·2 per cent.

Run the molten iron from the cupola into the ladle ; then take the right proportion of aluminium in a pair of tongs, or in a cartridge (iron) full of holes through the sides to let the gases out freely ; plunge it sharply through the molten iron to the bottom of the ladle, and stir the whole thoroughly for at least two minutes. On the introduction of the aluminium, the mixture will be found to become very lively, and to "work" considerably, almost, so to speak, to boil ; the stirring should be continued until this agitation begins to subside. If the mixture be not well stirred, the castings will be found to be spongy, and to have little air-cells in them. Both the tongs, or cartridge, and the aluminium should be heated and dried before plunging, or the metal may fly. The man who plunges the aluminium in should be well guarded against the metal flying.

Photographic Club.—The subject for discussion on April 16th will be "Printed-out Opals ;" April 23rd, "The Development of Instantaneous Exposures."

ON THE SENSITISING AND CONSERVATION OF ALBUMENISED PAPER.*

BY C. CATALDI.

It is generally allowed that a good negative ought to produce a good positive, but it must always be carefully understood that in order to have a good positive a well prepared paper is essential. The sensitising of the albumenised paper is on this account one of the most important operations of photography, and it may even be said that, next to the preparation of the sensitive emulsion for the plates, it ranks, in a descending scale of importance, the first.

A customer who pays a visit to a photographer for the purpose of having his photograph taken, is anxious to receive good pictures. He little recks that the photographer, in order to accomplish his desire, is bound to obtain a good negative, and to develop such negative with this rather than with that developer—all that the customer requires is a good portrait. This he pays for, and troubles himself no whit about aught else. It is, therefore, clearly to the photographer's interest to select a good quality of paper, to sensitise it in a proper manner, and never to entrust, through ignorance or carelessness, this most delicate of all photographic operations to any inexperienced hands.

The foregoing serves to explain why many persons well known and long experienced in the photographic art have occupied themselves in the preparation of paper with serious diligence, and why it is sought to secure, at least for some time, the preservation of the sensitive state after sensitising by seeking a remedy against the yellowing of the paper.

Signor Klary—from whose kindness I have received much information in regard to my experiments in this matter—to whom, indeed, any praise which may result from them is wholly due—has demonstrated incontestably the necessity of a strict attention to the degree of concentration of the sensitising bath, and to the duration of the floating of the paper.

The concentration of the bath determines more or less rapidly the coagulation of the albumen, and from this it follows that its density should be delicately adjusted, so as on the one hand not to hasten the coagulation necessary, because this would hinder the silver bath from penetrating the albumen ; and on the other hand, not to retard it beyond what is necessary, because then the bath would be very easily absorbed, not only by the albuminous stratum in which it ought to remain, but also by the paper itself, entailing thereby a grievous damage.

The duration of the sensitising process ought to be in exact proportion to the quantity of salts contained in the albumen, to the concentration of the bath, to its temperature, and to the temperature of the place where the process is carried on. As Signor Klary observes, in all operations having regard to the sensitising of the paper, an exact and perfect harmony is necessary, to which must be added, in my opinion, a just criterion, because it is easy to understand that the floating of the paper over the sensitising bath has no other end than to cause the transformation of the nitrate of silver into chloride and albuminate of silver, and this transformation occurs, as I have already said, relatively to the quantity of chloride of sodium which the albumen contains, and, therefore, in a

* Translated for the Photographic News from the *Bulletin* of the Italian Photographic Society, published at Florence.

determinate lapse of time. When all the chloride of sodium has been transformed, the prolonged contact of the paper with the silver bath is not only useless, but even prejudicial, because the nitrate of silver continues to filter itself into the pores of the paper, which, thus sensitised, no longer retains in the impressions that transparency of tints which would be apparent if all the salts of silver were found on the surface of albumen. In this last case the image is retained upon this surface, and the paper, preserving its whiteness unaltered, produces impressions praiseworthy alike for their transparency and their relief.

More clearly to demonstrate the truth of this assertion, I will call the reader's attention to the fact that prints taken upon aristotype paper are generally better than those upon albumenised paper in the matters of transparency and depth of tints, which the former shows in marked superiority to the latter, and this only because all the chloride of silver contained in the former paper is distributed in the gelatinous mass, and the paper itself is therefore preserved uncontaminated. An impression upon albumenised paper rendered as translucent as one upon aristotype by the method of Signor Crozat, fails to acquire the value of the latter if the sensitising has been excessive. From my own experiments, I can guarantee as fairly trustworthy the following formulæ, which I here tender with all good will to such of my honourable fellow-workers as may desire perchance to prepare in their own laboratories a paper which may be satisfactory to them.

Temperature.	Percentage of Silver Bath.	Duration of Sensitising.	Notes.
From 2° to 16° C.	10·5 Grammes	From 60 to 70 secs.	These indications are for *simply albumenized* paper. For *doubly albumenized* the duration of the sensitising must be increased by a few seconds.
„ 17° „ 29° C.	9 „	„ 35 „ 50 „	
„ 30° „ 35° C.	8 „	„ 26 „ 30 „	

The paper thus sensitised may be kept very well for a few days, if care be taken to preserve it in a dry place. If, however, it be desired to keep it for a longer period, several methods of preservation have been suggested, which I will here recapitulate for the benefit of those who may wish to avail themselves of any of them.

Dr. Van Monckhoven advises the addition to the silver bath of as much nitrate of magnesia as there is nitrate of silver contained therein. This receipt I have not found to answer very well.

Mr. William Bedford advises the sensitising of the paper in the ordinary manner, and after that allowing it to float for about a minute on the sensitised surface in a bath composed of—

Distilled water	1,000 c.c.
Nitrate of silver	62·5 gr.
Citric acid	62·5 gr.

The *Bulletin* of the Belgian Association of Photographers prescribes the use of leaves of blotting-paper impregnated with carbonate of soda, which are interposed between the sheets of dried sensitised paper. Rolled up together with these, the sensitised paper may, says the *Bulletin*, be preserved.

Doctor Stolze gives the following method:—The paper is to be sensitised upon a silver bath of 10 per cent., and while not yet completely dry, is to be floated on the side opposite to the albumen upon a bath of citrate of potassium (1:30) for about four minutes. It is to be then washed with rain water, and toned, after fixing, with a bath of sulphocyanide of gold.

M. Leon Vidal, in the *Photographie des Débutants*, suggests putting the paper, after the sensitising process, and on the side opposite to it, for the space of five minutes upon a bath composed of—

Distilled water	1,000 c.c.
Gum arabic	30 gr.
Citric acid	20 „
Tartaric acid	20 „
Hydrochloric acid	20 „

M. Leon Warnerke counsels the use of *nitrate of potassium* in the ratio of 1:4, with which the paper is to be wetted after the sensitising, and on the side opposite to it.

Mr. Debenham, of London, points out the use of the perchloric acid of commerce. He adds ten drops of this acid to every 30 c.c. of the sensitising bath.

Mr. Taylor declares that his own experiments lead him to employ tartaric acid rather than citric acid, which is the acid generally used to preserve the sensitised paper.

Captain Abney asserts that if the sensitised paper be kept in a place perfectly dry, and otherwise empty, it may be preserved for an indefinite period.

Herr Liesegang, in his treatise *Handbuch des Praktischen Photographen*, indicates two distinct methods. With the first of these he prescribes the addition of a small quantity of citric acid to the silver bath, which is composed as follows:—

1.—	Nitrate of silver	20 gr.
	Distilled water	100 c.c.
2.—	Citric acid	2 gr.
	Distilled water	100 c.c.

After the complete solution of the substances, No. 2 is poured into No. 1, and five drops are added of phenol (carbolic acid). The sensitising of the paper is effected in the ordinary manner.

For the second method we are told to sensitise the paper with the usual bath of ten per cent., then to let it float, while yet somewhat moist, on the non-albumenised side, on a bath composed of one part of citric acid to fifteen parts of water for about ten seconds.

From my own experience I have found that the best methods to adopt are those indicated by Herr Liesegang, with which I sensitised several sheets of paper upon the 21st of November in last year. These sheets I have found with pleasure to be well preserved up to the present time. Printing, toning, and fixing succeed with these methods well and easily—a result which I have not obtained after other methods of treatment.

If the advice given by M. Leon Vidal be followed, the paper will not retain its sensitiveness if it be allowed to float on the second bath for the space of five minutes, as the author prescribes, whilst, on the other hand, it will be preserved excellently well if the time be restricted to ten or twelve seconds. This inconvenience aroused in me the idea of discovering its cause, and I thought at first that some endosmose of the silver had taken place into the gummy and acidulated water, because, whilst the image appeared pale on the side of the albumen, it presented itself in the clearest manner when looked at as a transparency and from the back. But I afterwards considered that this inconvenience possibly was caused by the transformation into chloride of silver of the excess of nitrate of silver which remained in excess on the surface of the sheet—a transformation due to the action of the chlorhydric acid—and as it is known by the investigations made in this matter by MM. Davanne and Girard, that the silver reduced by the light to the metallic state releases chlorine,

which, finding itself in the presence of nitrate of silver forms successively new proportions of chloride upon which the light continues to exercise its action; so it seemed to me clear that, wanting that part of nitrate of silver in excess, the image remained somewhat faint and pale. I cannot, however, speak with any certainty, as I have not had sufficient time to study this phenomenon. Very probably one of my suppositions may be just, but I appeal to all my excellent companions and fellow students in the photographic art to endeavour to give a more exact explanation of the matter which I submit to them.

For applying the preserving bath to the paper, the method which I have hitherto found the best is that which follows:—Every sheet, as soon as it is removed from the sensitising bath, is to be suspended by two of its corners, letting it hang a little on one side, and so drained. When a certain number of sheets have been sensitised, and whilst the paper is still moist, the excess of liquid which may yet remain on the lower margin is to be removed by placing the sheet between some folds of white blotting-paper. It is then to be floated on the acidulated bath, on which it is not to be left more than ten or fifteen seconds. The object of this second bath being used whilst the sheet is still moist, is facility of the working, since the paper is then much more pliant, and in a condition most favourable for the prevention of that curling up which would certainly spoil it.

PHOTOGRAPHY IN NATURAL COLOURS.

In the *Standard* of April 2nd is the following letter on the above subject from its Vienna correspondent, who has had an interview with Dr. Eder in relation to the alleged photographs in natural colours, which attracted attention at the Camera Club Conference. From the letter it will be seen that the method of Herr Veress is a secret one, that Dr. Eder has not been made aware of its nature, and that so much of the method as has been made known is chiefly Becquerel's process, except that the chloride of silver is applied emulsified in gelatine or collodion, but that also is not new. In fact, in such details of the process as the Correspondent has been able to obtain, there is nothing new nor even comparatively recent:—

I have already mentioned, in a former telegram, that the photos of Herr Franz Veress, of Klausenburg, Transylvania, were shown to me by Professor Eder at the Photographic Institute. The interesting specimens were sent to the Institute not by Herr Veress himself, who, perhaps, does not know German, and was, therefore, not able to write to Professor Eder, but by the Hungarian landed proprietor, Herr E. von Gothard, of Herény, in Hungary, an amateur photographer, who had heard of the achievements of the unknown Transylvanian artist, and, out of scientific interest, assisted him in the pursuit of his discovery. The photos are upon glass and upon paper. The former are diapositives, and if looked through show, for the most part, a beautiful ruby-red ground colour, with a picture in bright, sometimes brilliant, colours, from the deepest hue of ruby-red—far deeper than the ground colour—to light orange, with several shades of red and yellow, and from violet to aniline blue, and the intensest, most brilliant blue that can be imagined. The same colours prevail also on the paper positives, which have all a greyish-brown ground-colour, upon which the red inclines more to purple than ruby, and the violet is especially brilliant. Green is missing on all the positives, and it is not known whether Herr Veress has succeeded in producing it, since the photos now in Vienna were obtained some four weeks ago. I looked at the photos, together with Professor Eder, through a magnifying glass, and we could not detect a single impurity in the drawing or in the pigment of the colours. The outlines of the pictures are perfectly exact, and each colour stands out from the other with marvellous distinctness. Professor Eder told me he did not dare to expose the photos to the direct sunlight, as he was afraid of their being injured; but he was astonished to find that the colours were quite unaffected, and not changed in the slightest degree, after being exposed to the ordinary daylight in Dr. Eder's office for fully three weeks, during which the photos upon glass and paper were examined by a great number of persons, were lying about uncovered at different times of the day, and were also shown during a lecture at the Society for the Propagation of Natural Science during gas-light. Such permanency of colour on photos has, Professor Eder says, never been known before, and constitutes the principal achievement of the Transylvanian discoverer. It will be necessary to expose the photos to a more severe light experiment before final judgment can be passed; but if we remember that in former cases of photographing in natural colours a coating of varnish has had to be applied to protect the colours, as otherwise they would have faded away within a few days, if not within a few hours, it must be admitted that the solution of the problem has been greatly advanced by Herr Veress, when he has succeeded in making the natural colours durable for such a long time in diffused light.

In sending the photos, Herr von Gothard gave the following details of the applied process. The sensitive preparation is a silver chloride emulsion in collodion, or in gelatine, and the solution being prepared in a peculiar way, which is the inventor's secret, it is poured upon either the glass or the paper, where it soon takes a brownish-red colour. The plate is put into a copying frame and exposed to the rays from a transparent coloured drawing, of which the negative picture is soon visible, the dark parts appearing, of course, in white. The exposure has to last in the case of glass negatives two to three hours, and in the case of paper at least three days, as the colours come out very slowly, but the picture having been fixed in an alkaline bath, the colours become brighter and more intense. The process in the camera would require an exposure lasting several weeks, but even the ordinary process will be largely reduced if some experiments on which Herr Veress is at present engaged succeed as well as he hopes, and, according to the latest information, he has already so changed his original system as greatly to lessen the time of exposure, especially for the paper negatives.

Professor Eder has not made the slightest attempt to penetrate into the secret of Herr Veress's process, in order not to deprive him of the ultimate pecuniary benefit of his arduous labours. All he would say is, that Herr Veress, who must be a very clever practical photographer, has most likely by some professional device so changed the process described by Carey Lea some two years ago, of applying the photo chlorides of silver in the form of an emulsion, as to achieve what nobody before him has succeeded in, namely, photographing in several colours which are permanent. The substance he uses is probably much the same as that experimented with by Herschel in 1840, by Becquerel in 1847, 1848, till 1855, and by Niepce de St. Victor, 1851 till 1866. But the system is a different one, and, as it has led to such great results in so short a time, it may be presumed that Herr Veress is the right man to bring the solution of the great problem within reach, if enabled to pursue his studies on the subject.

Professor Eder is not quite sure whether he must regard the colours on the Transylvanian photos as a real pigment, or as the effect of very thin layers. He is delighted with the exactness and precision of the coloured picture obtained by Herr Veress, and although he must, of course, look upon photographing in natural colours as still in its infancy, and even the results of Herr Veress as only a crude specimen of what ultimately may be achieved, the possibility of fixing colours for such a long time is, in his opinion, so great a step in advance that minor shortcomings are of small importance. I gave the professor everything to read that has appeared in the *Standard* since the first article on the subject, and after going through all the letters, he said—

"Captain Abney's results in obtaining natural colours by photography have never been seen on the Continent. I am, therefore, not able to say anything about them. The process of Mr. Ives, of Philadelphia, is printing in colours by the aid of photography, and not photographing; it can, therefore, in no way compare with the discovery of Herr Veress, which is quite a different thing. The photo-chromic pictures produced in Philadelphia are also produced in perfection by Albert, in Munich, and by Sieger and Lowy, in Vienna, and to my taste those of Sieger are the best in existence. But, as I said before, that is chromo-lithography, in which photography is only an accessory, and not sun-printing in natural colours. The other statements in the letters to the Editor of the *Standard* are completely negatived by what you have seen yourself, and what I can vouch for as really achieved—namely, the retention of the colours for several weeks. Everything else rests with the future, and the problem is, of course, not even approximately solved as yet."

The professor is quite a young man, very energetic, very cautious in scientific matters, and given heart and soul to natural science in all its branches. He is the director and leading spirit of an Institute which has not its equal in the world. It owes its existence to the energy of Baron Gautsch, the Minister of Public Instruction, who founded it as a State Institute with the assistance of the Vienna Town Council, which placed the greater part of a house in the Wertbahnstrasse at its disposal, defrayed the cost of the necessary alterations, and still provides the lighting, heating, and the service in the four glass-covered studios, nearly forty different rooms, and the large class-room, which together make up the Institute. The first expenses for fitting up, and for the purchase of a very large collection of instruments and appliances, photographic as well as physical and chemical, were defrayed out of a State grant, and the current expenses are met by a State subvention and the fees of the students. These number at present nearly two hundred, including several ladies, in addition to a great number of amateurs who do not attend all the lectures given by the six professors, but only follow special branches, and have the use of the Institute as far as they need it. The students are, to a large extent, foreigners, and I spoke to two young gentlemen, sons of photographers in the vicinity of Chicago, who have come all the way from America to attain perfection in the different arts connected with photography. The speciality of the Vienna Institute consists, mainly, in the union of every art or profession into which photography enters as an auxiliary, besides the promotion of studies in photography itself and in its application to science. The Institute has been in existence only since the 1st May, 1888, and has already such a reputation that applications are made from all parts of the world for places in the different classes, usually half a year before the courses begin, as the number of seats is limited.

Treatment of Uranium Residues.—Large quantities of uranium salts are used in the analytical laboratory for the estimation of phosphoric acid in manures and agricultural produce. M. Lacebe has proposed the following treatment for recovering the uranium in the residues of this operation:—When a sufficiently large quantity of liquid containing its precipitate of phosphate of uranium has accumulated, the supernatant liquid is decanted off, and the precipitate is boiled with soda until dissolved. After cooling, and without filtering, ammonia is added, and the phosphoric acid eliminated by means of the ordinary magnesia mixture. Twelve hours later the liquid over this precipitate of phosphate of magnesia and ammonia is syphoned off, and the residue washed with ammoniacal water. The filtrate from the phosphate of magnesia is neutralised by means of hydrochloric acid or sulphuric acid, and the carbonic acid is eliminated by boiling the liquid. The uranium which the latter contains is now precipitated by ammonia; the precipitate is washed with water, to which a little sulphate of ammonia is added. It is finally dissolved in nitric acid taken rather in excess, and the solution yields on evaporation crystals of nitrate of uranium. These are collected in a filter, and washed with a minute quantity of very cold water.—*Burgoyne's Monthly Magazine.*

THE ART OF DRAWING AND PHOTOGRAPHY.*

BY A. M. ROSSI.

In an article written by me some time ago in the *Photographic Quarterly*, I endeavoured to show the preponderating influence that photography bears on art. I went, perhaps, a little too far in mentioning certain facts and incidents, and this brought upon me an avalanche of hostile criticism from my brother artists. On this occasion I propose, notwithstanding, to follow on the same track, and try as best I can to prove that photography, instead of being the useful servant to art, has almost become its mistress.

When photography was in its infancy, a thorough academical art education was acquired by long, tedious, and assiduous study. Drawing, by which is meant not only an outline, but the inside accentuation and modelling of the form by means of the correctness of values and passages in the *chiaroscuro*, formed without exaggeration three-fourths of an art education. The rest was occupied by the student in learning, if learning it could be called, the art of painting. Students admitted in the academies began by copying from the flat, and then drawing from the cast, extremities, and heads, and busts, &c., attending at the same time classes in anatomy, geometry, ornamentation, elementary architecture, and perspective, all considered necessary for the formation of an art draughtsman, who, after a period of six or eight years, if he could distinguish himself by executing an original cartoon of a given subject, was promoted to the last and to him most fascinating school, that of painting from life, where he could nestle until he felt his wings strong enough to fly in search of name and fame. Beyond teaching a few tricks and the way of holding the pallet and the maul stick, the professors contented themselves in passing their own private opinion upon the works. Hence it was that one day Professor A. would pronounce a painting too hot, and the same would be too chalky for Professor B.; an academy from life would be lacking in transparency for Professor C., and the same a day or two later on, in too light a key for Professor D.; and so on. He who is not born a painter can never become a great one. Some of the best prodigies in the academies, in emerging into the schools of painting, have thoroughly flagged, and it is hardly necessary for me to mention many names of men of modern times who gave up the pallet, or used it to the detriment of their beautiful designs. We have an Overbeck, a Kaulbach, a Cornelius, a Tancrede, almost our contemporaries, great men who threw the brush away. We find an Ingres in France, a Maclise in England, who merely smeared their immortal compositions; the art of drawing constitutes the longest and only teachable part of an artist's education. In the days I am speaking of painters were fewer than now. Only those who distinguished themselves were recognised, or even admitted into society; wonderful transition from the days of Medicis, Charles V., of Francis I., of a Leo X., whose munificence made their courts the centres of genius, for they loved art and honoured the artist.

Nine-tenths of the art students belonged to the lower classes of the people, mostly artisans' or farmers' sons; the academies were, no doubt, well stocked, but not one in a hundred became an artist at all. Before the second or third year of their studies some would be caught by the conscription, others would become shopkeepers' apprentices, and I have known many of my chums accepting

* Abstract of a paper read before the Camera Club Conference, and published in the *Journal* of the Club.

situations as waiters at a café: thus this little illustration of which I can bear witness, is, I venture to hope, sufficient to prove that it was beyond any moral possibility in those almost pre-photographic days, for any house-painter's apprentice, or a boy cow-keeper, or a cabin lad, or an artists' colourman's son, to go to bed one night, in the fulness of his various vocations, and awake a year or two later a ready-made artist, as has been the case in this and other countries beyond any possible dispute within these last twenty years, because in those days, when artists had to depend solely on their intellectual efforts and the training they received from their masters, who admitted in their *ateliers* only men of exceptional talent, the paths of art were comparatively free from the useless and poisonous weeds that now infest it. Now, thanks to the facility that photography offers alike to the strong and the weak, the ranks of art are overcrowded with aspirants to fortune and to fame. A few push their way through the crowd and attain excellence, more wrestle with cruel mediocrity, and the majority are canvas daubers, who glut the market with rubbish, to the destruction of art, the gradual degeneration of artists, and the disgust and confusion of the patron.

With your kind permission, I will now try and put before you an illustration in support of my forthcoming assertions. We take two young men, one in good circumstances with a liking for art, although not an artist, who, not knowing what else to do, decides to become one. The other is a boy born in poor circumstances, but a painter; within him lies dormant the instincts of a designer and an artist. Whilst the first goes through his academical training, the latter goes about with the painter's can, being an apprentice to a house-decorator.

The former devotes six or eight weeks in shading the head of a Vitellius, stippling it with the point of the crayon and bread putty. The apprentice, with a piece of chalk, is smearing with forms of all kinds every available space of wall he can come across. The academy student is busy trying to win a scholarship for best drawing from the antique, and the little apprentice, getting hold of a photograph, traces it on a smooth piece of board at his master's shop, and with his master's paints he colours it. It is a portrait of his employer, who, having detected him, instead of discharging the refractory one, sends him at his own expense to Heatherly's to join the evening classes. There he learns in six months enough drawing to enable him to copy with exactness anything from the flat. After six months' education he copies from a Christmas number a picture, which he sells for £1; next he buys for 2d. the photo of a pretty lady from a hawker's wheelbarrow, makes an enlargement, paints it, and sends it to an exhibition, where it is hung and sold. Without any further instruction the boy now devotes every available minute to painting from nature, and goes to the parks, and in the country, producing landscapes. His first attempts are naturally consistent with the slow awakening of his genius, but steadily progressive, and gradually approaching that manly and rapid development characteristic to all men of genius. In that manner he devotes two years, when he has the courage of submitting one of his landscapes to the crucial test of the academical council. It is accepted, well hung, and sells. This bit of luck gives him an opportunity of visiting frequently the Royal Academy, and he uses his keen eye of observation, without, however, allowing his mind to be influenced by what he sees around him. Meanwhile the Royal Academy student sends an ambitious figure-subject, and it is rejected.

Henceforth the humbly-born young man is a regular exhibitor in the R. A.; each succeeding picture is better than its predecessor—his development is surprising to all. A pastoral subject of ambitious dimensions the following year attracts great notice, and, to cut a long story short, the young man is in the enjoyment of a great reputation, and perhaps an associate of more than one institute of arts. The R. A. student, discouraged at the repeated rejection of his works at the hands, most probably, of his teachers, throws pallet and brushes away, and turns his back on art for ever.

And yet, gentlemen, the house-painter could not draw, at this period of my narrative, from nature half so well as the Academy student, who is very well versed in anatomy, in geometry, perspective, all occult gifts to our young prodigy, who, on his part, could, however, produce a picture redolent with all the charms that only an artist can give. This little illustration, which, I venture to hope, will not flavour either of improbability or exaggeration, is a fact within my memory, which, however, could not have taken place in the days of Titian or Buonarotti under the same circumstances, unless the poor boy had a camera and all the rest of the multifarious appliances that photography offers us now.

If, therefore, we can trace the career of a brilliant artist, almost self-taught, how many more similar cases might we not have amidst us of men who attain the same results with no better means? and thus it is that I maintain that the cabin lad, and the yeoman's son, and the artists' colourman's boy, if born talented, can all reach the apex of excellence in art. It is immaterial what means are used, providing they are legitimate.

An artist must show what he can do and not how he does it. I conclude my paper by expressing my firm belief that the only teachable part of art, which is drawing, is sinking with the rising of photography, and, to my humble belief, the days are not far off when a youth, born with artistic instincts, in a few months of mechanical instruction can be his own teacher, and photography will be his academy.

PHOTOGRAPHIC GROUPS.

BY FRED HART WILSON.

The successful "group" marks the top notch in the scale of photographic achievement. It is certainly the most difficult problem, exacting and uncertain.

The painters, infinitely less trammelled than the photographers, themselves feel this; so much so, that the power of successful combination of a number of figures into the unity of a composition has always been the mark of a master. One has said that to paint one figure is simple, two very hard to manage, and the difficulty increases in geometrical ratio with every additional figure introduced. Another declares that composition is simply a special faculty, not to be acquired, but inborn; one either has it, or has it not.

This, however, is too severe, and we will proceed on the understanding that composition is not unique among human accomplishments, but, like other things, may be attained by intelligent study. The artist's assertion is simply a significant tribute to the difficulties of the subject.

In the very first place, a word on the mental side of composition may not be wasted. It does exact, for

thorough success in it, a certain mental power of calling things up, of projecting the picture on the air, of seeing with the mind's eye. One must, in fact, see the finished picture before it is begun. The way to begin the construction of a group is not to get together models and accessories that seem likely to look well, and then worry them about until an idea of some kind occurs. The idea must come first—there must be some distinct notion of what one is going to do, and the more clean-cut this idea is the better. After that, of course, there may be infinite experiment and alteration; but the thing is to get an intelligent start, and not take the subject by the tail end first.

It is the faculty the French, as a nation, possess of putting a thing visibly before one, of seizing and completely embodying the point of an idea, seeing all over and all around it at once, that makes them so supreme in art.

It may, perhaps, be well to define the group, as we begin, as a number of persons gathered in one picture, with some common interest binding them together. The last clause at once rules out the masses of people who may be seen in many so-called group pictures, each one a separate object, independent and unique. There must be some rational relation between the figures, and some reason, besides that of their being photographed, for their being there together. A pyramidal arrangement of six people, one on the floor, two seated, and three standing, all looking straight ahead, vacuous and without any visible reason for being, is not a group. It is simply six people—six units, not one.

And the photographer must realize this difference between photograph and picture. He cannot arrange people like the specimens on the shelves of a museum, and expect a picture. He cannot show the full faces of all the five people of a family, for instance, and expect anything but five separate portraits. Some of them must be sacrificed to some degree, and must be seen in profile, or three-quarter view at most. If he wants to make a picture of such a family, I think the only solution of the difficulty will often be to take two photographs, or more, if he can. In one he may show the full-face photographic portrait view of two or three, sacrificing the others to the exigencies of composition; in the other, he may make those thus lost the important heads, and subordinate the first ones. Any family which has enough artistic sense to care for a pictorial quality in their photograph, will not object to the double exposure. Yet it is by no means impossible that he could get good portraits all on one plate, which is, after all, the object of the group. He will very often find more beautiful and more characteristic aspects of the face in the quarter circle, of those from three-quarter view to full profile, than in the front face view, and by skilfully using these may safely tread in the thorn-beset path, and make both a satisfactory photograph and a picture.

A reason for the group must always exist, and be well in evidence; in other words, the composition must tell its own story. The figures composing it must not be there without a reason, and they must be doing something. It is not enough to account for their being together, the mere fact that they are being photographed—as we find so often in groups of families, associations, clubs, and societies. Of course, where three hundred men must be taken on one plate, there is usually nothing to do but put them there in rows, like figs in a box. But even this can be avoided in many cases, and with a reasonable number the devices for giving life and picturesqueness to the group are as numerous as life itself. The family may be reading, talking, looking at something, or, if accessories can be brought in, engaged in characteristic occupations. A good example of the success with which even a large group may be treated, and that within ordinary limits, is a plate I have seen of the jury for the admission of pictures into the *Salon*. All the pictures are good and sufficient, yet the whole is real and stirring with life, and does not look arranged or photographic. And this is done simply by taking a front view, facing them behind two workmen who hold up a painting for judgment. The jury is looking at it, crowded rank above rank, in various attitudes; the whole thing is a success, both as a picture and as a series of portraits. Yet though the arrangement is very subtle and practically unnoticed, it is decidedly there, and success is not an accident.

And here a word on this topic of arrangement. There are certain principles, formulæ almost, which have found great popularity and acceptance on account of easy comprehension and simplicity of application. The two such that come in particularly in grouping are the "pyramidal principle," and the principle of circular composition. The former especially has had a famous career, and I fear a good many photographers consider that they have introduced the much-desired touch of "art" into their work, and are safe and sure to make a picture, when they have adopted the "one, two, three" system of arrangement referred to above. Yet it is to be remembered that artistic quality is a delicate and evasive thing, not by any means to be secured by definite formulæ and practical receipts. These principles are simply crude and rough statements of the general experience of value up to a certain point. They are above all not to be applied too literally, remembering what "the aim of art" is said to be. They must be as well concealed as the skeleton is concealed by the flesh. They are merely the framework of a picture, and their corners must not stick out, but must be very deftly covered and hidden in the finished composition.

The truly universal principle of good composition, if there is one, seems to be a certain sinuous sway of lines and a harmonious connection of things with one another, that balances mass with mass, and gives that indescribable sense of satisfaction to the eye in passing from one to another. This is what we feel, rather than any cold and mathematical arrangement of symmetrical pyramids or complete and uniform circles. It must be much more felt than done by rule. The trouble lies in taking these abstract formulæ as rules. Any plate of the Crucifixion, for instance, by the old masters, will show how thoroughly covered up, and modified, and transgressed they have been.

A final hint on illustrative compositions, such as the Hiawatha and Evangeline. In reading over the subject, certain passages will strike one as having the graphic quality, calling up pictures. Let the photographer select a number of these, and then reading and re-reading them, try to get all the circumstances in his mind, or at least to embody his impression as vividly and really as possible, until he positively sees something. The larger part of art is mental, let him remember, and so not be in haste to get his models before him until he has something for them to do. After that let him labour, and alter, and try experiments, and re-arrange *ad infinitum* in the details, if he wish. When the jewel is secured, it may be cut and polished patiently to perfection.—*Wilson's Photographic Magazine.*

Notes.

Tho rumour is that portraits will be more numerous than ever at the next Academy. Indeed, some have gone so far as to say that it will be known as "The Portrait Year." The fact cannot be denied that the most remunerative branch of art which the painter can take up is portraiture, and it is not surprising, though it may be regretted, that men who have made their name through works of imagination and poetic feeling have turned their talents to the delineation of the features of merchants, princes, doctors of divinity, and society ladies. Towards this end, photography has contributed. Undeniably there has been a rage for portraits; the crowds round the shop windows show the direction of the public taste. The outcome of this tendency, of course, varies according to means: while those with limited purses are contented with photographs, the wealthy patronise the painter. There cannot be the slightest objection to this so long as the public who pay their shillings to the Royal Academy have not to undergo the infliction of having to gaze on perpetual portraits.

The Stereoscopic Company has had its annual meeting, and declared its annual dividend of five per cent. This is the fifth year of the Company's existence, yet it has never realised the promises held out in the prospectus. A safe five per cent. is not bad as times go, and considering that Consols yield now no more than $2\frac{3}{4}$; but the general idea is that a photographic business is an extremely lucrative one, and therefore the inability of the Stereoscopic Company to get beyond five per cent. must be a little disappointing to the shareholders. Nor does it appear that the chairman was able to give any very definite reason for the falling off. All he said was: "Five years ago, when we put this concern into a company, the price that was paid for the business was a price that would have paid seven per cent. to the shareholders taking the profits over an average of the twenty-three preceding years. Now, if these profits had been realised, that would have given you seven per cent." Quite so; but the discontented may ask how is it these profits have not been realised? Mr. Howard V. Kennard failed to explain this. Indeed, he left the statement to stand by itself, and the inference is unavoidable that the Company has not been doing so much business.

But again the question will again be asked, why? The last five years have been almost without parallel in the growth of photography, and the "turn over" in the sale of photographic materials. It is true portraiture has fallen off, but the loss here must have been nearly counterbalanced by the extension of photography in directions other than the sale of apparatus and chemicals. Under the two last heads the returns must have been very large indeed, for every amateur five years ago hundreds can now be numbered. It would have been interesting to the profession, as well as to the shareholders, if the chairman could have given his views on this point; but possibly this would have involved details of the "trading account" which few business companies like to divulge, as it gives information to their rivals. Mr. Kennard, however, has hopes of shortly being able to get back to a six or seven per cent. dividend.

Mr. Henry Blackburn, the Editor of *Academy Notes*, is advertising lectures and classes for instruction in drawing for the press. It is quite time the principles were established on some fixed basis, not the least important being the requirements of photography. We do not see this specially mentioned in Mr. Blackburn's advertisement, but it may not be overlooked. For want of the most elementary knowledge of photography, we saw the other day a reproduction of a drawing by an experienced and skilful artist totally spoilt. The artist was chiefly accustomed to draw on transfer paper, but thinking to produce a finer result, he made the drawing on card to be photographed. Unfortunately, he omitted to cut out the faint pencil lines, and then was surprised to find the reproductive print with several curious marks and blemishes, which were totally inexplicable until the original was examined. The artist then was amazed to find that lines which were quite faint to the eye, were reproduced almost as strongly as those in ink.

A curious theory as to colour-blindness and its cause under special conditions has been put forward by Mr. W. A. Sherwood, in a paper read at the Canadian Institute. He says, in regard to the effect of colour in nature upon the eye, that in Philadelphia one out of every five of the children there is found to be colour-blind or compelled to wear glasses. He alleges that this is due to the lack of colour in this somewhat prim and monotonous city. He contends that the greatest painters the world has produced flourished in lands where colour was seen on every side. From these resources of nature the artists drew their inspiration, and not from shops of fashion. Colour-blindness is almost unknown in many countries—Japan, Spain, and Italy, for example. In Philadelphia we have, unfortunately, the reverse of this. Mr. Sherwood believes this lack of appreciation accounts for the preference many persons there have for steel engravings and prints to paintings. This, he holds, is false to the principles and teachings of nature. Those who favour engravings do so honestly because of their training in black-and-white, to which from childhood they have been accustomed. The children of the Quaker City have seen the sombre attire of their parents, and even worn the same themselves; their city surroundings show the white marble residences and the black roadway, and their books and writing are all black and white. Hence their sense of colour is limited. There seems to be some force in this reasoning. A limb, if allowed to remain inactive, finally grows torpid and useless. Why not also a sense?

FERDINAND ADOLF BEYERSDORFF.

From the *Photographische Correspondenz* we translate the following account, relating to the death of the well-known Viennese photographer, Herr Beyersdorff.

With Beyersdorff disappears once more a typical figure from the familiar artistic circle of professional photographers in Vienna. Beyersdorff was essentially a self-taught photographer, skilful extremely in all the manual functions of his art, and well experienced in modern delineation. He was born on the 3rd of May, 1837, at Limeritz, in the royal district of Frankfurt-on-the-Oder, and was originally intended for a mercantile career, but apparently not liking this employment, obtained a place on board a merchant vessel as a sailor, and served afterwards in the Royal Prussian Marines. An unlucky accident, by which his breast was seriously injured, rendered him useless for military service, though he was discharged in a fairly sound condition from the hospital at Marseilles.

Beyersdorff's first acquaintance with photography was made in Berlin in the Grundner Atelier, and he afterwards obtained a place in the Studio of Reproduction of H. Hirsch, in those days a flourishing institution. Here he remained for five years, and acquired for himself knowledge of the most varied character, taking especial interest in the production of portraits on porcelain. At the age of sixty he left Berlin for Vienna, and was then employed for various intervals in the studios of Julius Leth, C. Haack, Victor Angerer, and Pokorny and Reuter. He stayed for some time at Kozmata, in Pesth. Then, for several years, he possessed a studio of his own. In the meanwhile Beyersdorff had been actively employed in reproductions by F. Bruckmann, in Munich, and Römmler and Jonas, at that time Wilhelm Hoffman, in Dresden. Beyersdorff has made himself known repeatedly to the readers of the *Photographische Correspondenz* through his communications, showing considerable practical knowledge of photography. He was nevertheless rejected when he applied for the post of Professional Instructor in the Royal Institution established for experiment and instruction in this art.

In the beginning of the current year Beyersdorff began to sicken; unlucky financial conditions affecting his private purse hastened doubtless his deathward career. As if inspired with some sad presentiment, he with much labour and difficulty reduced his varied experiences and experiments to some sort of order, intending to publish them for the use and gratification of his fellow professionals, but in the midst of his toil, in the month of March of the present year a pneumoplegea, or paralysis of the lung, brought his busy and careful life to a comparatively sudden end.

A new amateur photographic society entitled "Freie Photographische Vereinigung zu Berlin" has been established under the presidency of Herr Gustav Fritsch.

The Royal Institution.—The general monthly meeting was held on Monday, April 7th, with Sir James Crichton Browne, M.D., LL.D. F.R.S., Treasurer and Vice-President, in the chair. Mr. Arthur Edward Ash, Mr. Robert Dobbie, Mr. William S. Hall, Major Percy A. Macmahon, R.A., Miss May Pollock, Mrs. Joseph Shaw, and Major-General C. E. Webber, C.B., were elected members of the Royal Institution. The special thanks of the members were returned for the following donations to the fund for the promotion of experimental research:—Mr. Ludwig Mond, £100, and Mr. Lachlan M. Rate, £50.

PHOTOGRAPHIC EXHIBITIONS IN AMERICA.*

There are some things in connection with photography of which, as a nation, we may well be proud, and there are some in connection with which we might profitably take a leaf out of the book of our brethren across the water. Of the latter, by far the most important, in our opinion, is the holding of exhibitions of photographs as frequently as possible, and in as many centres of population as may be practicable.

Readers of the various English journals devoted to photography cannot but be struck with the many exhibitions that are noticed in almost every number as being held all over Great Britain, even in towns that a few years ago would have been considered too small to offer a chance of success, and perhaps even more striking is the fact that they are successful, not only in so far as really good displays of photographs are almost invariably got together, but that they are almost always financially so. It is true, we have annually one grand—or what ought to be a grand—exhibition, in connection with the Photographer's Association of America, but in consequence of distance, and other causes, it is seen by comparatively few, and has little or no influence in the most important phase of such institutions, the education of public taste.

Exhibitions, less pretentious, but vastly more useful, have also been occasionally held by several local societies, but before such influences can be brought to bear on the whole people, they must become much more numerous; be more systematically organized, and especially more thoroughly popularized.

We have repeatedly expressed the opinion that the only way by which photography as a profession can be raised from its present position to the platform which it ought to occupy, is the elevation of photographers themselves from photographers merely to artists in the true sense of the term. Photography will never attain to its rightful position till those who practise it cease to be content with pretty, nicely-finished photographs; and not only aim at, but succeed in making each photograph a picture.

In the present state of matters, however, so long as a certain degree of technical success in photographic practice is so easily reached, and the general public are sufficiently ignorant of art as to be satisfied with such productions, it would be unreasonable to expect much improvement; and thus we are met face to face with the fact that photographic advancement really depends on the art education and culture of the public.

We believe that properly organized and properly popularized exhibitions would be found among the most efficient, if not *the* most efficient, of all means of promoting such education, and therefore urge every photographic society and club throughout the country to get up at least one exhibition every year. How best to do that it is not for us to suggest, as the details will probably require to be different in different localities, but a few suggestions may not be out of place.

In the first place, and perhaps most important of all, there should be no question of "shop" introduced, and absolutely no distinction between professional and amateur. Although we have frequently shown the impossibility of making satisfactory awards for works of art, we know that as yet awards must be offered as inducements to photographers to send pictures for exhibi-

* From *The Beacon*, of Chicago.

tion, and so medals should be offered, but offered for the best pictures considered from an art point of view, and irrespective of process or person. Many of the societies are too weak to do much in the medal way; but we are persuaded that if the thing were fairly started and properly wrought, each exhibition would not only pay its own way, but leave a balance in its favour.

Then the Photographers' Association of America might redeem its character by lending valuable aid. It might save some of the money now worse than wasted in very much overpaying officials, and make a suitable die from which silver and bronze medals could be struck and offered for competition. The medals would cost little more than the price of the metal, and be infinitely better than the fancy, but generally little to be fancied designs that are selected from year to year. One or more of each of such medals given to each society, and offered as the "Association medal," would be, we believe, eagerly competed for, and an excellent means of securing large numbers of exhibits.

Another cardinal point should be the abolition of the foolish system of charging for wall or exhibition space. Not only should the exhibits be admitted free, but, whenever the society can see its way to it, the carriage should be paid one or both ways, and the hanging committee should have full power, and exercise it rigorously, to exclude every frame that does not come up to a certain standard. By frame we of course mean picture, and no picture should be admitted without a frame.

The most difficult question is undoubtedly that of the judges. In selecting them it should be kept in mind that the object of the exhibition is to promote the advancement of art, and that fine finish, "chemical effect," and all that sort of thing, should be utterly disregarded. At the present time that would almost imply that the jury should not include a photographer; or, if it does, he should be one who would rather give the prize to a production of Mrs. Cameron or Rejlander, stained and blotched, and technically imperfect, as they too often were, than to some pictures to which were awarded a gold medal at the Boston convention for nothing but nice finish and technical qualities. But it is difficult for a photographer to altogether ignore "beautiful sharpness" "delicate detail," &c., &c., and, therefore, we would put our trust in a jury of acknowledged artists.

But all this, even if done in the very best way, will be but labour in vain, so far as the main object is concerned, unless the public can be induced to come and see. How this is to be achieved each society must decide for itself. We were once prominently connected with an exhibition in a city of 250,000 inhabitants, for which we had gathered together from all quarters of the globe 1,149 frames, sent by 208 exhibitors, and displayed them to excellent advantage in a suite of six great halls, the use of which was liberally granted by the government of the time. The galleries were occupied till 10 o'clock on the night before the advertised day of opening, but the pictures were unpacked and standing in corridors and ante-rooms, and a few minutes after that hour a number of willing hands carried them in. They were examined by the committee of selection, passed to the hanging committee, and hence to the walls so rapidly that by 10 o'clock next day the exhibition was opened and the catalogue in the hands of the printer, who handed us the proof-sheets a little after 12 o'clock.

We doubt whether ever so much work was done and done so well in such a short time, but it should be remembered that it was not done by paid officers. It was all a labour of love and could not have been done for filthy lucre.

But although we had arranged certainly the best photographic exhibition that had as yet been seen, and had ticket seller, check taker, and doorkeeper—the latter a government official in uniform and cocked hat—all ready to welcome the dear public, that public did not come. The second day seemed about to pass as unsuccessfully, and some of us were looking, or at least feeling, very blue. A meeting of the committee of management was held, and one of the members said it was quite evident that the public had no idea of the treat that awaited them, and, consequently, must be brought in to see it. The only way to do that was to make the exhibition fashionable by getting the military band to play during the afternoons. On its being pointed out that it would cost 35 dols. a day, or some 875 dols. for the month, and that we had not the wherewithal to pay it, he offered to guarantee the payment, and the offer was accepted on the spot.

Next day the band marched from the castle through some of the principal streets and into the galleries, bringing in its train an influx that almost filled the rooms. In the meantime some of the newspapers were induced to send art critics, and for others art critisms were written, so that for a few days every morning paper contained a glowing account of the treasures to be seen, and thousands that were crowding to see them. In short, the exhibition was a great success, and yielded a revenue of nearly 4,000 dols., which not only enabled the committee to pay all the expenses and give a handsome, but unexpected, honorarium to each of a few of the most active workers, but also to place in the bank a good round sum to be available on a future occasion.

Somewhat Dismal News.—"We have been favoured," says *Burgoyne's Monthly Magazine*, "with a copy of the weather chart of London, compiled by Mr. B. G. Jenkins, F.R.A.S., from which we abstract the following particulars concerning our disgraceful climate for the year of grace we are now in:—April—Rather wet, especially for ten days round middle. May—Rather dry; wet for about a week round the 25th. June—Rather wet. July—Wet; thunderstorms about 3rd, 8th, 15th. August—Wet; stormy about 9th and 22nd. September—Rather wet. October—Dry; but gales about 5th, 15th, 22nd. November—Dry; fog about 12th, 17th, 19th. December—Rather dry; but gales about 8th, 20th, 27th.

The Liverpool Amateur Photographic Association.—This Association will have an Optical Lantern Evening on Monday, 14th April, when an entertainment will be given at the City Hall, Eberle Street, Liverpool.—Part I., at 7·30 promptly, "The Hundred of Wirral," the Completed Survey, with Descriptive Lecture by Mr. John Hargraves, when about one hundred and fifty lantern slides will be shown, from negatives taken by the members of the Liverpool and Birkenhead Societies. Part II., at 9·15 promptly, the New Boston (U.S.A.) Set entitled the "White Mountains," with full descriptive matter supplied by the Boston (U.S.A.) Photographic Society. An excursion will be made to Raby Mere, on Saturday, 12th April. Members can meet at Club Rooms, at 1·30, or on the Stage at 2 p.m. The train leaves Birkenhead at 2·20, and is due at Bromborough at 2·39; taking the lanes and cross country route, finishing up at Raby Mere. The train leaves in return at 6·40, due at Landing Stage 7·15, or a later train is timed from Bromborough 7·45; due at the Landing Stage at 8·25. Conductor: Mr. William Tomkinson. The pictures of Mr. Harry Tolley are now on view. Members can obtain tickets for the admission of friends on application at the Rooms.

THE LATENT PHOTOGRAPHIC IMAGE.*

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

Few questions are of greater interest to the scientific photographer than the nature and properties of the latent image, *i.e.*, the result of impact of light on a photographic plate, invisible to the eye, but quickly revealing its presence when the plate is treated with a reducing agent in the form of a developer. It has been the subject of a considerable number of experiments, and a very large amount of speculation, and a paper which aims at giving a complete summary of what is known about the matter, as distinguished from what is merely guessed or surmised, may not be without some value. It is often very useful to realise exactly what point we have reached, and what problems still remain to be attacked.

We are concerned with the action of light on the haloid compounds of silver embedded in gelatine or collodion and surrounded by the aqueous vapour and other gases of the atmosphere, and are only indirectly interested in the effect of light on these salts when pure or merely in contact with water. The changes which take place under the latter conditions have, however, an important bearing on the probable nature of the latent image. Briefly, it may be said that the published experimental evidence shows that perfectly pure silver haloids in a vacuum are not decomposed by light at all, but in the presence of moisture silver bromide or chloride is altered with formation of a dark-coloured compound containing a lower percentage of the halogen than the original salt. At the same time a substance is formed which has the power of liberating iodine from potassium iodide, and if the action of light takes place in presence of liquid water, the solution gives a precipitate of silver bromide or chloride on addition of silver nitrate. The nature of the substance which acts on potassium iodide has never been satisfactorily investigated. The dark, solid product is in all probability not metallic silver, because the action of light readily takes place even in the presence of nitric acid so strong that it readily dissolves the metal. For a long time it has been supposed that the dark substance is silver-sub-bromide or sub-chloride, but this point will be discussed later on.

When light acts on the silver haloids in a collodion film, the halogen which they lose may interact partly with the moisture which is always present, partly with the pyroxiline. It is, however, well known that pyroxiline shows comparatively little tendency to yield chlorine or bromine derivatives, and hence it is probable that the part which it plays in the alteration of the silver salts is of secondary importance.

Gelatine, however, behaves quite differently. It readily takes up chlorine and bromine, and if bromine water is added to a solution of gelatine, a yellowish, curdy precipitate of a bromo-gelatine is formed. Knop found † that gelatine will take up as much as 30 per cent. of bromine, forming a yellowish, insoluble compound. There can be little doubt, therefore, that when light acts on the silver haloids in presence of gelatine, the bromine or chlorine which they lose combines with the gelatine. We have, indeed, direct evidence in the fact that where the light has acted the gelatine becomes less soluble. The readiness with which the gelatine takes up the halogen explains its great efficiency as a sensitiser, and the consequent high sensitiveness of gelatine plates.

* Read at the Camera Club Conference, and published in the Journal of the Club.

† *Chem. Centralblatt*, 1879.

Three views as to the nature and mode of formation of the latent image seem to me to deserve attention. Many hypotheses, and guesses unworthy even of the name of hypothesis, have been put forward, but have served only to prove that their promulgators were incompetent to deal with the question by reason of their want of acquaintance with the established facts of chemistry and physics. The problem is, in fact, of a high degree of difficulty and complexity, and its solution will require experimental work of the same order of accuracy as the work involved in the determination of the atomic weights of the elements. It seems almost necessary to point out that work of this kind involves a certain amount of preliminary training.

The physical theory of the latent image assumes that the energy of the light rays is transferred to the molecules of the silver haloid, which are thereby thrown into a state of unstable equilibrium such that the compound is reduced to the metallic state by re-agents which, under normal conditions, would have no action on it. The chief evidence in support of this view was the observation that the latent image spontaneously disappeared. There is, however, a considerable amount of evidence to show that the latent image does not fade spontaneously, but in all cases where its disappearance is observed it is destroyed by the action of atmospheric impurities, or by secondary reactions with substances retained in the film. Carey Lea, who was at one time one of the firmest supporters of the physical theory, showed* that silver iodide will absorb free iodine, and hence the gradual disappearance of the latent image on Daguerreotype plates or any other films obtained by treating silver with an iodising agent may be traced to the fact that the silver iodide has absorbed an excess of iodine during its preparation, and this iodine gradually acts upon the product of the action of light and re-converts it into normal silver iodide.†

Analogy would lead us to expect that if the silver haloid were thrown into an unstable condition by the action of light waves, it would gradually and somewhat rapidly return to its normal condition when the disturbing cause ceased to act. I have myself kept gelatino-bromide plates for fourteen months after exposure without observing any reduction in the character of the image on development. Other workers have kept exposed plates for two‡ and even three§ years. It is in the highest degree improbable that a mere *condition* of unstable equilibrium would persist for so long a time, and these facts, combined with the fact that the latent image is destroyed by re-agents of a particular kind, but not by others, seem to me to be conclusive against the physical theory.

(To be continued.)

A Japanese Photographer.—In its issue of March 22nd, *Anthony's Photographic Bulletin* gives a photogravure reproduction of the portrait of K. Ogawa, founder of the *Shashin Shimpo*, the only photographic periodical published in Japan. Prof. W. K. Burton gives a very interesting personal history of the Japanese photographer, and recounts the difficulties that had to be overcome by him in acquiring a knowledge of photography. The picture referred to was reproduced from a print furnished by Mr. Burton.

* *Amer. J. Science*, xxx ii.; Photographic News, xxxi., p. 386.

† Carey Lea himself *(loc. cit.)* supposes that the iodine which the silver iodide loses when exposed to light is absorbed by the adjacent unaltered silver iodide, and in course of time re-converts the photo-iodide into the normal iodide. It is doubtful whether silver iodide can act as its own sensitiser, and it seems to me that the other explanation here given is the more probable.

‡ Berwick, *Brit. J. Phot.*, 1882, pp. 542 and 549.

§ Wright, *Phot. Mittheilungen*, 1882, p. 16.

SUPPLEMENT TO THE "PHOTOGRAPHIC NEWS."

With the present number of this journal is issued a portrait of Thomas Wedgwood, who produced in 1802 the first English photographs. The original is a crayon drawing in the possession of Miss K. Wedgwood, of which a negative was taken for us by Mr. Ralph W. Robinson, and the photogravure work has been done by Messrs. Waterlow and Sons.

Correspondence.

THE PHOTOGRAPHIC SOCIETIES' NATIONAL CHALLENGE CUP.

Sir,—In reply to the letter in your last number, signed by Mr. Edgar G. Lee, we append the following copy of a letter addressed to that gentleman some days before the opening of the Exhibition. We venture to think that your readers will conclude that in offering to allow the Newcastle Society to substitute other pictures for those which had been previously shown and medalled at the Crystal Palace Exhibitions, we did even more than they had a right to expect.—Yours faithfully,

S. G. Buchanan Wollaston.
J. F. Peasgood.

Crystal Palace, March 28, 1890.

Edgar G. Lee, Esq.

Dear Sir,—Your papers duly to hand, and we are much obliged for the great care you have taken. We must just point out that Mr. Gibson has included two pictures with the same titles as previously sent; also Mr. Lyd. Sawyer has sent again "The Boat Builder," though shown here in 1888, and "The Castle Garth," shown here last year. As we cannot admit pictures more than once, perhaps they would like to substitute others.—Yours truly, J. F. Peasoood,

Crystal Palace, Feb. 26, 1890.

THE CRYSTAL PALACE CHALLENGE CUP COMPETITION.

Sir,—We approach this subject fully aware how unpleasant the task usually is of championizing our own works, and this alone would have induced us, under any other circumstances, to leave matters as they stand in the Crystal Palace Club Cup Competition, but for the glaring injustice of this extraordinary award, and the duty it involves of warning the photographic world against encouraging its repetition.

We have so much proof of the Cup having been misdealt with in this present case as to amount to a positive *embarras de richesse* when it is necessary to reduce it to a sufficiently compressed space for presentation before your readers.

Previous to determining on entering for this Challenge Cup Competition, we carefully perused the entire rules appertaining to it, as forwarded to us for that purpose, and found it to be thoroughly open, with absolutely no restriction as to amateurs or professionals only competing, no limitation as to size or class of photograph, and no mention even that pictures which had been previously exhibited in individual classes at the Crystal Palace were not eligible. Carefully abiding by these rules, we selected and sent 75 pictures, more than 45 of which had already received awards; 24 lantern slides and 6 stereoscopic slides, most of which had also previously been medalled.

We received the following acknowledgment and acceptance of our exhibit, under date of February 26th. [See letter quoted above.]

This was, of course, tacitly accepting all our exhibits with the exception of the four pictures mentioned. These latter were sent because we found that *there was no rule debarring them*, and because it was as reasonable to accept pictures for the Challenge Cup class which had been shown in individual classes last year as to accept pictures shown in individual classes this year. However, on receipt of this letter, Mr. Gibson and Mr. Sawyer each wrote to the executive separately, requesting that the four pictures alluded to should be placed aside until the end of the exhibition, and Mr. Sawyer forwarded two others in place of those of his objected to.

Subsequently, we received another letter from the same source, of which the following is a sufficient extract, dated March 8th:—

Your Club exhibit has arrived safely, and all pictures are hung. I think you will be very pleased with the show.

If all our pictures were hung, in face of two separate requests from us for four of them to be withdrawn, it suggests that either they were, after all, accepted as admissible by the executive, or else that they were still hung as a weak plea for afterwards disqualifying us. Which was it?

We next hear of our pictures through *Photography* of March 20th, which states:—

At the time of writing this we do not know the awards, but, to our minds, Newcastle—by reason of having at least five noted professionals represented—stands far away ahead. Next must come the Liverpool Amateur, which is represented by an excellent lot of pictures.

Writing later, in the same number, *Photography* again says:—

It will be seen by our report that the Society Challenge Cup Competition at the Crystal Palace has fallen to Birmingham. It is rather a significant fact (*vide* report) that when the award was announced on the sheet, it appeared as "Three Cheers for Birmingham." Before expressing any further opinion on the matter, we should like to know *if any Societies were disqualified, and why?*

The *Amateur Photographer* for March 21st contains the following anent the Cup Competition:—

Next year probably some conditions will be laid down by the management, for surely it cannot be an equal competition when one of two alcoves occupied by the Newcastle Society is filled by the work of two such men as Gibson of Hexham, and Lyd. Sawyer.

Now, one of the extraordinary parts of this quotation is that we have reason to believe it was written by one of the judges of the Cup Competition, and, although it says plainly that our exhibit was too good for the rest, yet the Cup has not been awarded us! We know that we *cannot* be *honestly** disqualified, and, as stated in our previous letter which appeared in your columns, we challenged an explanation, and stated that we had good authority for knowing that only a portion of our pictures was judged.

The following reply from the Executive, dated March 24th, was duly received:—

In reply to your letter of 21st inst., I have the honour to refer you to our letter of 26th February ult., and to Rules 6 (note to rule) and 16, marked and enclosed. You can have no *authoritative* information except through the hands of the Executive, consisting of Mr. Peasgood and yours faithfully, S. G. Buchanan Wollaston.

This is very nice and decisive, if we were prepared to accept it, and if there was no higher tribunal than these same Messrs. Peasgood and Wollaston to appeal to. But we did not take the trouble to make and send our exhibit only to be dealt with as *their* whims or interest dictated. There *is* a higher tribunal, in the shape of our photographic *confrères*, to lay the matter before.

Here, then, let us analyse their lame attempt at justification. "Our letter of 26th February" refers to the one above quoted, in which they objected to two pictures sent by Mr. Gibson and two sent by Mr. Sawyer. As Messrs. Gibson and Sawyer each individually wrote asking for these four pictures to be withdrawn, this fact ceases to have any bearing upon the case. The "Note to Rule 6" referred to says:—

N.B.—The Executive reserve all rights as regards the hanging of pictures, and may refuse to display any picture without assigning reasons for so doing.

This rule *in no manner* applies to us, as, according to their own statement of March 8th, *all our pictures were accepted and hung:* but whether or not this includes the four pictures objected to we cannot say, and as it was a matter entirely resting in their own hands, we are not legitimately affected by it.

Rule 16, as underlined by them, says:—

From the decision of the Judges there can be no appeal.

Very proper, so far as it goes; but more remains behind. They continue:—

You can have no *authoritative* information except through the hands of the Executive, &c.

* There is no question as to the absolute honesty of intention of the Crystal Palace authorities, and of Messrs. Wollaston and Peasgood.—Ed.

That is official-like, but, unfortunately, it is not, or *should not*, be true. The *judges* are—or, shall we in this case say, *should be?*—the first authorities in these matters, and it is from *one of the judges* we learn that Messrs. Gibson and Sawyer's pictures (not the four of them in question, but all, or nearly all) were left unjudged; hence, as the judges did not decide on all our exhibits, it is not a complete decision, and need not be final. Now what can your readers infer from this array of facts? The letter of the judge—a man of known integrity and eminence—was not sent us for publication, so we refrain from any possible breach of confidence by further locating it, and we have an amount of other confidential correspondence touching on the subject, couched in terms which would make Messrs. P. and W.'s ears tingle if they heard it.

We hope your readers will not think that we are still sighing for "the Cup that cheers" (!) We did at first intend to obtain it by legal means, but now feel it to be made of a too "base metal" to touch on any consideration; and if our Birmingham *confrères*—against whom we have no single word to say—feel that they can hold with honour what they must now know is not fairly their own, then they are very welcome to keep it.

It remains for us to apologise to you for the unavoidable length of our communication, which we trust may come, at all events, with some nogative appropriateness to the present discussion on rules and regulations at exhibitions. We, at least, have arrived at a very unanimous decision from this experience, which is, that we will individually and collectively carefully avoid any future exhibition associated with the names of Messrs. Wollaston and Peasgood, in the event of such a contingency ever again arising.

Auty & Ruddock,	W. Parry,
T. Galloway,	J. Pike,
J. P. Gibson,	H. R. Proctor,
J. E. Goold,	H. G. Ridgway,
Edgar G. Lee,	Lvd. Sawyer.

Newcastle-on-Tyne and Northern Counties Photographic Association, Mosley Street Café, Newcastle-on-Tyne, March 31, 1890.

THE CRYSTAL PALACE EXHIBITION.

Sir,—Will you please announce in next issue that the award in Section 4, Lantern Division, was made to Fred H. Evans, and that Mr. Wade's initials should have been "J. W."

J. F. Peasgood.

Photographic Society of Great Britain.—At this Society on Tuesday, April 15th, at 8 p.m., at 5a, Pall Mall East, London, a paper will be read by Mr. C. H. Bothamley, F.C.S., F.I.C., on "A Standard Method of Development."

Salted Paper for Enlargements.—The *Bulletin* of the Photographic Society of Italy, published at Florence, gives in its last number a special formula for salted paper for enlargements, communicated to it by Signor G. Moretti, a member of the Society and Director of the Studio for the Dilettanti Photographers in Florence. The formula is this:—

Water	1,000 gr.
Gelatine	2 ,,
Chloride of sodium	4 to 6 ,,
Citrate of soda	21 ,,
Ammonia chlorhydrate	13 to 16 ,,

The gelatine, cut up into very small slices, is first dissolved in the tepid water; afterwards the other substances are added: when all are dissolved the solution is filtered, and placed in bottles for use. To prepare the paper, the mixture is poured into a basin, and the sheets are allowed to float for three minutes, using the same precautions as in the preparation of albumenised paper. After the moisture has been removed from the sheets prepared with this solution, they are sensitised on an ordinary 12 per cent. silver bath, and when dry they may at once be used, and a beautiful tint, imitating perfectly that of hematite, will be obtained. When the bath above described is employed, especially if it be fresh and uncontaminated by any noxious vapours, the sensitised paper may be kept in excellent condition for three days during the summer, and for a week in the winter season.

Patent Intelligence.

Specifications Published.

5,337. *March 28th*, 1889.—"Photographic Cameras, and Apparatus in connection therewith." William Henry Smith, Upton Villa, Beckenham Road, Kent, Engineer, and William Willis, Bromley, Kent, Manufacturer.

Our invention relates to photographic apparatus, and one of its objects is to provide improved means whereby sensitised plates or films may be conveniently transported, and may at any time be inserted in and removed from the camera without liability to exposure of the said plates or films to light. Our said invention, moreover, comprises an improved shutter, hereinafter described, for facilitating exposures of short duration.

For holding the sensitised plates and transferring them, as required, to and from the camera, we employ a holder or dark-slide, which comprises a metal sheath or case, one end of which is open, and is firmly attached to one side of a tube having slots therein through which the plates may be inserted in and removed from the said sheath. In the said tube is fitted a plug of shutter of any suitable material. This plug is so formed that the portion thereof which corresponds with the slots in the tube is semicircular or of other convenient shape in tranverse section so that it will, in one position, close the opening or mouth of the sheath, or case, and thus exclude light, but, by turning the said plug about its axis through a greater or less angle, a clear way through the slots and the open end of the sheath may be made, through which the photographic plate can be inserted or removed.

Our improved dark-slide is very compact and can be cheaply manufactured. Moreover, the said dark-slides can be very closely packed, so that a large number of them may be contained in a comparatively small space.

To provide for the use of our improved dark-slide on a camera, we attach to the said camera a tube or portion of a tube with a slot in it through which a plate may pass into or from the camera; this tube is of such internal diameter that the tube on the aforesaid sheath or case will accurately fit and slide in it. The tube or socket on the camera is, moreover, provided with a slot throughout or nearly throughout its length to admit the sheath or case, so that the dark-slide can be readily applied to or removed from the camera. When the dark-slide containing the plate is slid into position in the aforesaid tube or socket, and the plug is turned by a key or otherwise through the required angle, the plate will fall through the slot in the said tube or socket into the camera; grooves or other suitable means are provided in the camera to hold the plate in a proper position therein. To remove the plate from the camera, the latter is inverted, and the operations above described are performed in the reverse order.

In some instances, we provide a key or other device in one end of the tube or socket on the camera, so that, by turning the dark slide through the required angle after it has been inserted in the said tube or socket, the said dark-slide may be opened and closed.

In other instances, we arrange within the tube or socket on the camera another slotted tube capable of revolving therein, and adapted to receive the tube on the sheath. Then, by arranging in a proper position the key or other device for opening and closing the dark-slide, we are enabled to insert the sheath in the tubes on the top or side of the camera in a plane parallel thereto, and then, by turning the said sheath about the axis of its tube, the opening of the sheath will be effected, and the slots in the tubes brought into line with each other, thus permitting the plate to fall into the camera. When the plate has been thus transferred to the camera, the sheath may be turned back so as to lie parallel with the top, and therefore out of the way, or, when in this position, it may be altogether withdrawn, the slot in the camera, when the inner tube is in this position, being closed by the said inner tube.

We sometimes provide the camera with means for attaching a dark-slide to the top thereof, and another dark-slide to the bottom thereof, one for the insertion of the unexposed plates

into the camera, and the other for the reception of the exposed plates from the camera. We can employ with a camera any desired number of interchangeable dark-slides constructed as above described.

If desired, we provide means whereby the sliding of the tube on the sheath into the tube or socket on the camera will effect the opening of the dark-slide.

We sometimes employ a slotted tube, or socket, similar to that above described, in combination with a dark-slide of ordinary construction (or with a receptacle similarly used), so that plates or films may be inserted therein and removed therefrom by means of our improved dark-slide without risk of exposure of the said plates to light.

Our improved dark-slide is constructed to contain a single plate, or is adapted to contain and successively deliver more than one plate. In the latter case, the dark-slide is provided with grooves, or other devices, for keeping the plates apart, and is made reversible in the tube, or socket, on the camera.

We sometimes provide for facilitating the removal of the camera from a tripod for the purpose of inverting the camera to change plates by means of our improved dark slide, and for permitting the removal and replacement of the camera without risk of altering a position already secured by the tripod. For this purpose we provide on the underside of the camera a projection, or block of wood or metal, having parallel sides. This projection fits into a suitable groove, or opening, in the tripod-head, or, preferably, in a turntable which is attached to the tripod-head, capable of being partially closed, so as to tightly clamp the said projection. The closing of the sides of the groove against the said projection may be accomplished by means of a spring, screw, cam, or eccentric, or otherwise.

Our improved shutter for effecting exposures of short duration comprises two plates, or pieces of metal, or other suitable material, each having its inner end V-shaped, and its outer end provided with a projecting pin or stud. These pins or studs slide in cam-grooves formed in a disc of ebonite, or other suitable material, acted upon by a spring whereby it is partially rotated to open and close the shutter.

If the shutter is applied to a lens of the doublet or rectilinear type, the slides are preferably arranged to operate between the lenses, the mount of the lens being cut or divided for the purpose of admitting them. When the shutter is closed the V-shaped ends overlap each other, and when the shutter is opened so far as just to admit light through the lens, the aperture thus formed should be central in respect to the lens. These V-shaped shutters slide easily over one another in grooves, and, on being operated, they first of all recede from one another until the maximum aperture is given to the lens, and afterwards approach each other until the aperture is closed. The aforesaid grooved disc is preferably fitted to turn on the mount of the lens. A catch with a trigger forms a convenient means for releasing the spring for operating the shutter. A suitable device is provided for winding up the said spring. We prefer to use, for this purpose, a ring or annular piece fitted to turn in a box or case enclosing the said disc. The duration of the exposure may be regulated by winding up the spring more or less as may be required.

Twelve claims are appended to the complete specification, which specification is accompanied with drawings.

8,085. *May 15th*, 1889.—"The Production of Developers." Henry William Jones, 17, White Street, Coventry (formerly, and at date of application, residing at 3, Grosvenor Street, Coventry), Chemist.

The nature of the said invention described as "Improvements in the Production of Developers for Photographic Use," is to produce a portable and permanent photographic developer, consisting of a specially prepared compound of hydrokinone in a compressed state. To accomplish this I take crystallised sulphite of sodium, or similar alkaline sulphite, but I prefer to use the ordinary sulphite, and I heat this until it fuses, and until all water of crystallization has been driven off. The dry mass is then ground with an equal weight of hydrokinone or other similar proportion, but I prefer an equal weight, and one-tenth part of the whole of bromide of sodium added. The mixture, after being thus made, is wetted with aqueous sulphurous acid, and then partially dried; and whilst still damp forced through a sieve of forty meshes to the inch, and dried at a gentle heat, by which means the compound is obtained in small dry granules. The compound thus formed is made into tablets, or circular discs, or pellets, by a powerful press.

What I claim is:—

1. The production of a compound, formed from alkaline sulphite, as sodium sulphite which I employ, hydrokinone and alkaline bromide, as sodium bromide which I use; the same compound being produced in the dry granular form, as and after the manner described.

2. The formation of the compound hydrokinone, produced after the manner described, into pellets, or tablets, or discs by pressure, exerted by a steam or other form of press.

7,939. *May 13th*, 1889.—"Shutters for Cameras." John Thomas Daniels, 14, Smith Street, Northampton Square, London, E.C., Mathematical Instrument Maker.

This invention relates to improvements in shutters for photographic cameras, the object being to combine simple instantaneous shutting mechanism with equally simple devices whereby the shutter can be kept open and the lens exposed for any desired length of time.

The shutter which I propose to use consists of a rectangular piece of sheet metal, mounted in vertical guides fixed in front of the lens or object glass. On the outer face of the shutter is a stud or button, and on each of the vertical guides is a similar stud or button, these latter being placed horizontally opposite each other and vertically above the stud in the shutter so that the three studs represent the three corners of a triangle of which the apex, represented by the stud in the shutter, is the lowest. For a reason which will be afterwards explained, the upper studs project further from the guide pieces than the lower one in the shutter. Around the three studs is stretched an india-rubber ring which, when free to act, raises the shutter and exposes the object glass. The shutter is, however, controlled by a notched lever pivotted below the lens tube, the notch spanning a pin on the bottom of the shutter, in which position it is retained by a flat spring. The releasing motion can be effected by pneumatic pressure or other device, and the contraction of the india-rubber ring jerks the shutter quickly upwards and retains no further hold on the stud in the shutter, as the latter falls in consequence of the lower stud lying in a different plane from the two upper ones, and the tendency of the ring to hang vertically when free to do so. Thus released, the shutter would fall under the influence of gravitation, but its downward motion is accelerated by a second india-rubber spring which is stretched across its upward path, and with which the stud in the shutter comes in contact, whereby its upward course is checked, and a rebounding motion imparted to it. For "time" exposures a vertical lever is pivotted to the shutter slides or other convenient part, the upper end of which is turned inwards towards the shutter. To the lower end of this lever is hinged an arm, which can be connected to the catch lever which retains the shutter in its closed position. As soon as the latter is disengaged by the pneumatic or other appliance, the shutter flies upwards, but before it can descend, the turned-in end of the side lever has advanced sufficiently to intercept its downward motion, and the operator can thus obtain any desired period of exposure.

It must be understood that the details above mentioned may be modified without departing from the main features of the invention.

7,007. *April 26th*, 1889.—"Producing Negatives for Mechanical Printing Processes." Charles Studders and Georg Kohl, of the firm of Studders and Kohl, of Leipzig Reudnitz, Germany.

This invention relates to the production in a camera of photographic negatives suitable for mechanical printing processes, and especially to the process in which the said negatives are produced by arranging before the sensitive plate a transparent screen having a number of opaque parallel lines or cross hatchings. Heretofore it has been usual to place the screen and plate in the dark back, and to expose the same in the camera for a certain period, and then to remove the dark back

and replace the screen by another screen, the lines of which stand generally at an angle of 90° to those of the first screen, and again expose the plate in the camera for the remainder of the necessary period of exposure. This twofold insertion of screens occupies more time and trouble, and the sensitive plate is liable to be shifted in the process so that the negative is doubled and therefore useless.

The object of this invention is to enable one screen to be used, and to be moved into the second position without removal from the camera.

To this end they support the said screen in a circular frame, providing the latter with a fixed bead and with a movable bead adjusted by set screws for holding the screen. This circular frame is supported in a circular hole in a suitable carrier, adapted to be placed in the camera so that the frame may be moved to an angle of 90° (or for a greater or less angle if desired) in its plane. Suitable stops are provided for accurately limiting this movement, which may be effected by hand by means of a cord connected to the frame and led out through a suitable hole in the camera. The screen being set in one position and the sensitive plate inserted, the lens is uncovered, a half time exposure given, and the lens is again covered. The screen is then revolved by the cord into the second position, and the remainder of the exposure given.

4,082. *March 8th*, 1889.—"Head for Camera Stands." Fox Shew, 88, Newman Street, Oxford Street, London, W., Maker of Specialities in Photographic Instruments.

The invention relates to an improved head for portable folding or non-folding camera or other stands: to this end the inventor so constructs the head that the supports may be removed, and when closed by inserting two of them within the third, and capping the third with a top, the stand may be used as an ordinary walking stick, preferably bamboo.

In practice he makes the head circular smaller at top than at base, for the purpose of obtaining an angle inside, so that when the sticks are inserted in their respective positions they form an extended triangle at base, making a firm support for the whole apparatus.

The inventor claims:—

The use of one complete circle and two half sections or half squares, preferably half circles, contained in one large conical ring, to attain the object shown in the drawings accompanying the provisional specification.

Photography and Wood Engraving.—Mr. H. Trueman Wood, in the course of discussion on a paper read at the Society of Arts by Mr. W. J. Linton, said that he thought the recent school of wood-engraving, in great measure, owed its faults and merits alike to photography and the public taste as influenced by photography. He had heard a lecturer on photography, holding up an excellent old woodcut and a modern one by the side of it, point out that by means of photography the public taste had been educated to look for something better than they were satisfied with twenty years ago. The public had got to look for minute detail, and the exquisite rendering of tone and colour effect which they found in photography, and hence were not satisfied with the semi-conventionalised older forms of wood-engraving; but this public taste for photography had somewhat avenged itself, for the recent school had succeeded mainly in copying the faults of photography, so that many of their engravings looked like badly exposed photographs. It seemed to be much easier to copy photographic faults, flatness, and absence of vigour, than to render that microscopic minuteness of detail which was in part one of the beauties and in part one of the greatest defects of photography. On the other hand, some of the more recent school of photographers—the impressionist or naturalistic school, as they were called—tended to imitate inferior wood-engraving, to strive after effects which photography was not capable of rendering, whilst dispensing with those which it would render most satisfactorily. Possibly by means of photographic methods they might get back again to a more vigorous style of work. The modern periodical press, which now depended for its illustrations to a large extent on photographic methods, demanded a rapidity which was incompatible with the finer quality of work.

THE LANTERN SOCIETY.

The new Lantern Society, under the chairmanship of the Hon. Slingsby Bethell, C.B., has issued a notice drawn up by its Council, suggesting that the objects of the Society may be fittingly attained in the following manner:—

1.—By the engaging of premises in some central position in London, at which the meetings of the council and of the Society may be held.

2.—By acquiring suitable apparatus for the purpose of giving exhibitions of general and scientific interest, to both members and their friends.

3.—By obtaining the services of specialists in every branch of art or science suited to optical demonstration.

4.—By offering, as far as the funds of the Society will permit, remuneration or awards for the development of the optical lantern, and of all apparatus pertaining thereto.

5.—By imparting instruction to those who are desirous of learning how to effectively manipulate the optical lantern, to produce slides and apparatus, and to efficiently employ the same both in private and public.

6.—By securing for the members of the Society special and advantageous terms from manufacturers and others for the purchase or loan of apparatus and slides.

7.—By forming a large and comprehensive loan collection of lantern transparencies pertaining to art, science, and kindred subjects; such loan collection to be placed at the disposal of every member upon conditions to be laid down by the council.

8.—By providing a means of inter-communication between the members of the Society, whereby each member may be made acquainted with the private collections of his fellow-members, and may be able to negotiate a mutual loan if so desired.

9.—By arranging an interchange of demonstrations between photographic, microscopical, and other societies interested in optical lantern work.

Proceedings of Societies.

Sheffield Photographic Society.

The monthly meeting was held at the Masonic Hall on Tuesday evening, when it was unanimously agreed that the first excursion be to Bolton Abbey and Woods, June 11th, or as near that date as can be arranged.

In reference to the late exhibition for the benefit of the Sheffield General Hospital Building Fund, it was announced that the nett amount to be given to the same was £10 10s., along with £1 2s. 9d., given by Miss Dorris Taylor.

Mr. T. Hibbert laid on the table some prints produced by the new "kallitype" process, which gave satisfactory results; after which Mr. R. J. Shields, of Mexbro', gave a paper, subject "Notes on a Tour in Norway."

London and Provincial Photographic Association.

At the meeting on the third inst., Mr. W. Bedford occupied the chair.

Mr. H. M. Hastings exhibited a print from a negative taken on an isochromatic plate, and also a print from a negative taken on an ordinary plate. From a comparison of the prints, it was generally conceded that the ordinary plate had proved the more rapid of the two.

Mr. J. J. Briginshaw showed a lantern slide of a microscopic object, from which the cover glass had been removed; the part of the film which had been in contact with the mask was covered with brown markings.

Mr. A. Haddon thought that the effect might be due to moisture from the binding strip getting between the glasses, or to insufficient washing.

Mr. Briginshaw exhibited a "facile" camera fitted with the new patent sheaths for holding the plates, by which any thickness of plate could be used.

Mr. A. Haddon, referring to a published article on "Celluloid and Electricity," in which a possible danger of electricity being generated in a celludoid film was suggested, said that he had made several experiments in coating celluloid films with emulsion, and he showed a negative in which the ramifications

of what was believed to be an electrical discharge could be clearly traced. Celluloid, he said, is composed of gun-cotton and camphor, and is known to be highly electrical, therefore as a support for sensitive emulsion is liable to give off a discharge with the least friction. Mr. Haddon mentioned an instance of simply drawing the film through the fingers in the act of unwinding it from the roller being sufficient to set up an electrical discharge to the detriment of the film.

Mr. W. COLES, in comparing the results of his experience with the eikonogen and ordinary pyro developers, said he should give preference to the latter developer for density of image.

Mr. W. E. DEBENHAM suggested that when reference is made to density, it should be borne in mind that it is of two kinds, ocular and printing.

The CHAIRMAN said that some makes of plates gave out during development a greater amount of free bromine than others, and this would influence the action of the developer, causing it to be more or less restrained.

Mr. A. COWAN had made many experiments with eikonogen by itself and also mixed with pyro, and had found no decided difference.

LEWES PHOTOGRAPHIC SOCIETY.

AT the ordinary meeting April 1st, with the President in the chair, Mr. G. J. Wightman opened a discussion on "Pinhole Photography," and specimen negatives and prints were passed round for inspection.

The Society is about to commence a photographic survey of Lewes and environs, to be carried out as far as possible during the coming summer; and it is intended to produce a set of lantern slides which can be sent to any other Society in exchange for a similar set.

The first excursion of the season will be to Newhaven, on April 24th.

At the next meeting, on May 6th, Mr. J. J. Holloway will read a paper on "Cloud Photography."

BOLTON PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held at the Baths, Bridgeman Street, on Thursday, April 3rd, Mr. EDMUND NAISH ASHWORTH in the chair.

Mr. R. HARWOOD gave a lecture on his journey round the world. Many of the places described by Mr. Harwood were, by the aid of the optical lantern, worked by Mr. James Leach, disclosed to view.

Mr. WALTER KNOWLES exhibited an apparatus, actuated by clockwork, for mechanically rocking the plate during development.

ERRATA.—In our last, the statement that Messrs. Skinner and Co.'s camera therein described was provided in addition with a fine adjustment, should have been, was "not" so provided. Mr. Fred. Ives, of Philadelphia, writes that the sense of the four last lines of the first paragraph of his communication (page 153) was destroyed by the transposition of punctuation marks: "The first semicolon should be a comma, and the next comma a semicolon; the last semicolon should be a comma."

FILTERING-PAPER FROM GRYCKSBO, SWEDEN.—In his "Treatise on Chemistry," vol. viii., p. 222, Berzelius expresses himself regarding the valuable qualities of this paper as follows:—"The best filtering-paper I know of comes from Grycksbo, in Dalecarlia; the water with which it is made is so pure that it does not give any reaction indicating the presence of foreign substances, nor does it retain any of the earths in solution. The acid and the water extract from this paper, and the ash which it leaves when burnt, are not more abundant nor of any other nature than those which come from the most unadulterated linen; that is to say, they do not amount to more than 0·006 of its weight. Latterly they have begun to make this paper an article of export, and assuredly there are few localities where nature has combined with so many favourable circumstances as at Gryeksbo for the fabrication of an excellent filtering-paper." Fresenius's "Guide to Quantitative Chemical Analysis" (1862, Fifth Edition, p. 81), on the subject of filtering-paper, says:—"The best is that known by the name of 'The Swedish Filtering-Paper," and which bears the water-mark of J. H. Munktell."—*Chemical News.*

Answers to Correspondents.

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

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

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

H. G. P. (Ireland).—*Kiewning's Gold Toning Bath.* Our correspondent is thanked for calling attention to some errors that have crept into the formula extracted from *Lux*, and printed at the bottom of page 196 of the NEWS for March 7th. First, that grains and grammes are mixed up together, and that "chlor. potass." is ambiguous, for it may mean either chlorate or chloride of potassium; it ought to be the latter, KCl. Furthermore, it should be stated that the proportions given furnish a concentrated solution, which requires to be diluted with from fifteen to twenty times its bulk of water before use. Employed in this way, our friend says that the bath produces remarkably fine tones, and that he has used it also with aristotype paper, getting shades of colour which he has not seen excelled.

UBIQUE.—*Photographic Triplicates.* The difficulty is to get rid of the lines of junction, and instead of printing the negative piecemeal, you should try and separate the exposures by moveable screens within the camera, but out of focus, as is always done in the case of photographic doubles. It may not be easy to accomplish this at once, but a few preliminary experiments may give you the requisite technical skill, and you should aim at producing a negative with uniform density throughout. We understand the problem by the help of your sketch. It is, as we supposed, two men playing at chess, and one (full face) looking on, all three being portraits of the same individual.

R. B.—*Portraiture Prices.* We are sending you two cards of terms for London: remember it is easier to make a reduction than to advance your scale of prices afterwards.

HISTORICUS.—*Some Dates.* Your list requires rather an extended search, but we can give you at once the following dates:—"Two Ways of Life," O. G. Rejlander, 1857; "Fading Away," H. P. Robinson, 1858; "Bringing Home the May," ditto, 1863; "Stolen Moments," John Hubbard, 1869; "A Wee Customer," Adam Diston, 1871; "Rebecca at the Fountain," Valentine Blanchard, 1873; "Tired Companions," George Nesbit, 1877.

K. SCHWIER is thanked for sending us the programme of the German Photographic Convention to be held from 26th to 29th August, at Eisenach, Saxe-Weimar. To those who can spare the time to visit this attractive region, seldom seen by Englishmen, a rich treat is provided, including the usual business meetings, an evening concert at the Wartburg, and excursions to Wilhelmsthal, Ruhla, and other places in the Thuringian Forest. There is likewise to be an exhibition of photographs, mechanical prints, apparatus and materials, for which gold, silver, and bronze medals, diplomas, and money prizes are offered. Full particulars will be duly announced in our columns.

PHOTARGUS.—*Small Pictures taken with Large Lenses.* Your questions 1 to 3 may all be answered in the negative; there would be no advantage in employing a whole-plate lens for carte-de-visite work. The *f* 4 lens would be most suitable for photographing animals and children. Other points in your letter demand a fuller answer, but this Easter week is a bad time for making enquiries.

A. W.—*Platinotype Patents.* 1. All the patents are protected in France and the United States, and some of them likewise in the more important countries of Europe, including those you named. 2. The Pizzighelli process could not be worked here without infringing the Company's patent. 3. But it is open both in Germany and Belgium. 4. There are two patents, bearing date 1887, the latest.

CINCINNATI and J. H. AINLEY.—Received with thanks.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1650.—*April* 18, 1890.

CONTENTS.

A PHOTOGRAPHIC EXHIBITION IN THE CITY OF LONDON.

THE Photographic Section of the London Chamber of Commerce, which includes among its members several of the chief merchants connected with the art-science in the Metropolis, has resolved to hold a trade Photographic Exhibition in the heart of the city of London. This Exhibition will open on Friday, May 30th next, and remain open till June 10th. No charge will be made to the public for admission. The committee of management of the Exhibition consists of Mr. W. S. Bird (Autotype Co.), chairman; Mr. Frank Bishop (Messrs. Marion & Co.); Mr. T. Watson (Messrs. W. Watson & Sons); Mr. Payne Jennings, and Mr. Conrad Beck (Messrs. R. & J. Beck). The Drapers' Company, which is one of the great livery companies of London, has generously lent its hall for the purposes of the Exhibition, and the Lord Mayor has expressed his interest in the undertaking.

The Drapers' Hall, in Throgmorton Street, in which the Exhibition will be held, is a more luxurious building than has ever before been used for public photographic purposes in this country. It is a palatial establishment, more of the type of the chief *salons* of Paris, than of the cold, repellent structures commonly used for public purposes in London. A range of gilded chambers will be used for the Exhibition, and the apparatus will be chiefly displayed in the Banquetting Hall. The Drapers' Hall is a quadrangular building, with a fountain in the centre; it is rich in statues and paintings, and belongs to a powerful and wealthy organisation of high antiquity. The first Drapers' Hall upon the Throgmorton Street site was bought of Henry VIII. in 1541, and had formerly been the house of Cromwell, Earl of Essex. The present magnificent hall, on the same site, was built in 1869.

The Drapers' Company was founded before 1252, and was incorporated in 1439, "the seventeenth year of the thrice Christian king, Henry VI.," whose letters patent gave it the name of "Masters, Wardens, Brethren, and Sisters of the Guild or Fraternity of the Blessed Mary the Virgin, of the Mystery of Drapers of the City of London." Immediately after its foundation, the livery began to expend for charitable purposes about £4,000 a year. Photographers will be deeply moved upon learning that the armorial ensigns of their new friends, the drapers, are three clouds radiated proper, each adorned with a treble crown or, the crest on a helmet and torse; a ram lodged at the second, attired as the third. Supporters, two lions, as the last, peletee. Motto: "Unto God only be honour and glory." The patroness of the Company is, or was, the Virgin Mary. Those photographers who, on bended knees, have, during the past two or three years, begged to be patronised, are thus, it will be seen, supported by an ancient precedent, and those other photographers who wish to spend much money for a peacock's feather—in shape of a royal charter—to stick in their hats, before getting their work done in establishing a library, laboratories, and so on, might persevere in their present principles by going to the Herald Office for a helmet and torse, as well as for other necessaries for the promotion of photography as an art and a science.

The coming Exhibition will no doubt be one of a first-class nature; it is under the control of good practical men, and will take place in the greatest centre of commercial activity in this country.

THE CAMERA CLUB CONFERENCE.

LONG reports of the proceedings of the Camera Club Conference have been published in these pages, and now, by the courtesy of the Camera Club, which has lent us the wood-blocks, and permission so to do, we are enabled to print more or less in full the papers read at the Conference.

PHOTOGRAPHIC COMPOSITION.

BY JAMES MEW.

Pope, in his Epistle to the Earl of Burlington, which constitutes the fourth of his so-called Moral Essays, after speaking of the use of riches and the abuse of the word "taste," gives some examples of the latter in horticultural construction in the following sentence:—

"No pleasing intricacies intervene,
No artful wildness to perplex the scene;
Grove nods at grove, each alley has a brother,
And half the platform just reflects the other."

The poet here finds fault in the matter of gardening with repetition, or that orderly and exact arrangement which Nature so seldom shows, and is therefore one of the evils to be guarded against by the artist, whether painter or photographer. Though, however, the sides of a picture, like those of a garden, should be different from each other, and though the character of the distance should not be reproduced in the foreground, or of the foreground in the distance: in a word, though repetition is offensive, yet balance is necessary. It would be clearly a mistake to photograph all the tall people of a group on one side, and all the short on the other. This would not, indeed, be repetition; but in running from one vice, we should be making our escape into its contrary. If in a picture there be a large tree on one side, and a vacuity—or, as Dr. Johnson might have said, a copious negative catalogue—on the other, the effect will be unpleasing.

This absence of balance—speaking with all possible deference to a distinguished Dutch artist—seems to be a defect in a well-known picture by Cuyp in the National Gallery, catalogued as a landscape with cattle and figures. Here the left-hand side contains little of importance, while the principal elements of the picture are grouped on the right, the figure on horseback, dressed in a coat of glaring vermilion, throwing additional weight into a portion of the painting which had already too much. On the contrary, Claude de Lorraine—who is now called Gellée in the catalogue of the National Gallery, which, indeed, was his proper name—has given, in a landscape known as "The Ford," a very admirable example of balance; and indeed of all the best general qualities of composition. The trees on each side of this picture are different, and answer well the purpose of their introduction. The right side is bold, but light; the left strong, but delicate. The whole presents that "artful wildness" which seems to have been as much desired by the painter as by the poet.

Composition in art has been well defined to be an arrangement of the separate objects represented, which leads the spectator to conceive that such objects are connected or interested in a subject common to them all. There must be in a well-composed photograph, whether of landscapes or figures, some central thought or fact animating the whole picture. What that central matter may be is of comparatively small importance, but it must exist. It is the pictorial *raison d'être* of the work. It is the focus of interest to which all the forms in the picture converge. It is the string which binds the scattered sticks together, giving them a force and meaning which, isolated, they cannot possess. It is the primary law of what is known as grouping. Digressions from this rule may be licensed in poetry, but in painting, photography, and sculpture, they can never be permitted. The picture of the photographer who has to represent a number of persons together must tell some story. It must not be in the condition of Canning's needy knife-grinder. The wheel out of order, the hat with the hole in it, and the breeches in a like condition, the knife or scissors in the act of being ground—these are all good in themselves, but they are not enough. The photographer who takes a group, say, of a dozen persons, every one of the twelve having none other connection with his neighbour than this, that he conceals more or less of that neighbour's figure by his own, or is himself concealed by more or less of his neighbour—every one of the twelve with a fatuous gaze on a previously indicated spot, a gaze which reveals only every one of the twelve's consciousness of having his portrait taken—every one of the twelve with a full-face aspect of melancholy resignation, or of smirking conceit—every one of the twelve so wholly isolated, in conception, from his fellow as to form no part, save numerically, of the picture—such a photographer clearly says, with the knife-grinder,

"Story! God bless you! I have none to tell, sir."

And, though he meets with no such sad fate as that outcast met with at the hands of the Friend of Humanity, yet he seems to merit some shadow thereof, if he calls himself an artist.

There is no surer proof of failure in any æsthetic composition than the fact that it is unable to tell its own story to the intelligent spectator. A photograph which needs the help of a commentary, a picture of which the meaning can be alone explained by a reference to its number in a printed catalogue—and not always by that—is clearly of less value than something which he that runs may read. The essential and fundamental notion of an æsthetic composition is an appeal to the senses. Intellectual difficulties would transfer it into another region, of which it is not an indigenous growth.

Though the subject of composition is extremely important to the photographer, it is, unfortunately, very difficult to give other than general rules concerning it. Like so many matters of importance, it cannot be taught by rule and square. There are audacious folk who have not hesitated to publish Rules of Politeness, Rules of Letter-writing, Rules of Etiquette, and many other rules, which are, doubtless, good enough of their kind so long as they remain in the region of the abstract and the general, but whosoever seeks in them a rule of conduct for a particular occasion will probably never find it, or, having found it and followed it, will not look back upon his conduct altogether with satisfaction. Some general hints may, however, be given, of which the first is of universal application. Let the photographer who is about to take a group form some clearly defined idea what his work is intended to express before he attempts to arrange its elements. This is such a plain, matter-of-fact piece of advice that its insertion would seem to be unnecessary, and so unjustifiable, were it not for the notorious fact that so many photographers sin against this, the first of the laws of composition. It were, indeed, all one for a man to attempt to paint something which he has not previously drawn, or to build a house without a scaffold. The artist must, in the first place, make his work clear to his own mind, and then it may afford intelligible interest to the minds of others. Having conceived his idea, he will arrange his characters to correspond with it. The usual plan is the reverse. He shuffles together his personages at haphazard, and if the group should turn out to be something in the nature of a circle or pyramid,

the two figures chiefly affected by the ordinary photographer, he will therewith rest content.

The absence of sameness, or the presence of variety, is another leading principle of composition. It is probably for this reason that an old cottage, however inferior to inhabit, pleases more in a photograph—owing to the many alterations in it sketched by the hand of time—than a brand new building, smooth and well adjusted by the builder's adze. So, again, a winding road or river delights the eye more than one which is straight.

Another rule for photographic composition is that the principal object should never be placed in the centre of the photograph; nor again, should several figures be in a direct line with one another.

Such rules, and others like them, are commonly understood by the experienced photographer, but they are not always followed. The unhappy man is only too often not allowed to follow them even when he will. He has to consider his customers. The Cheap Jack and the Beach-man, with whom public favour is as the very breath of their nostrils, though they may clearly understand such principles, experience constant difficulties in carrying them out. Their position is very much that of the poor playwright, who has too frequently to spoil his play for the sake of his players. Thoroughly acquainted with the principles of dramatic proportion, he must nevertheless make his drama lopsided to suit their notions of their own importance.

As every actor desires what is called in theatrical slang "fat," so every person of a group to be photographed commonly desires to occupy a prominent position. The idea of sacrificing herself or himself to the interest of the whole seldom enters the head of any individual member of a group. For such interest it is, of course, usually necessary that some faces should be taken in profile, and some in three-quarter face, but to bring about such a simple arrangement involves no ordinary toil. The pride, envy, jealousy, vanity, and general ill-feeling evoked on such an occasion is too well-known to the conscientious artist, and he must succumb in nine cases out of ten to the wishes of his clients, and the ordinary photograph of a dozen full-faces looking at nothing is the melancholy result. Were he to kick against the pricks his party would go elsewhere, and, after a preliminary fight among themselves, be photographed at last more or less to their own satisfaction, but with an utter disregard to the elementary principles of composition, and in a manner which would seriously shock any photographer who has received a proper education, or possesses an innate particle of artistic taste.

The Welsbach Gas Light Company, Gloucester, New Jersey, have fitted up a room in connection with their factory, for the purpose of showing the suitability of the light given by their burners for photography, and invite photographers to visit it, and satisfy themselves by experiment or otherwise.

Water-developing Plates.—The following is the formula used by Dr. Backelandt for coating the backs of his water-developing plates:—

Pyrogallic acid	...	154 grains
Salicylic acid	...	15 ,,
Gum or dextrine	...	154 ,,
Alcohol	...	1 fl. dr. 21 minims
Water	...	5 fl. drs. 25

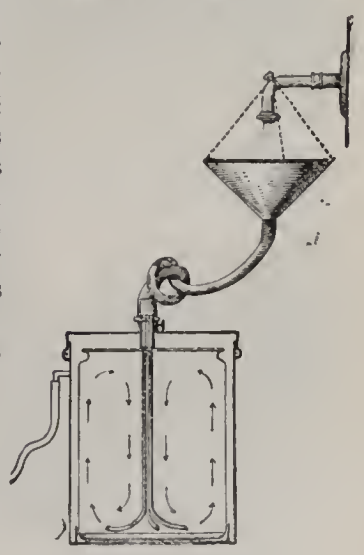
This is allowed to dry at the ordinary temperature. Development takes place by immersion in water with the addition of a very small quantity of ammonia.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Washing Apparatus for Emulsions—Acid Eikonogen Developer — Cheap and Effective Flash-Lamp — Chloride of Iron as a Restrainer — Eliminating Hyposulphite of Soda—Print-Washing Apparatus.

Improved Washing Apparatus for Emulsions.—In most of the existing pieces of washing apparatus for gelatine emulsions the threads of gelatine are, by the pressure of the water entering from above or from below, pressed tightly against the outlet tubes, where they stick, pap-like, and allow only a comparatively small quantity of water to pass. The washing therein is therefore imperfect, and must be continued for a comparatively long time. To prevent this, Herr Alois Brunner has constructed the following arrangement, in which by the inflow of water a constant circular motion of the threads from below upwards, and *vice versa*, is produced; the flow off of the water is not at all disturbed, and no loss is caused by the finer particles of emulsion being washed away. The arrangement consists of a sufficiently large, wide-mouthed glass vessel, in which a system of three or more small glass tubes reaches to the bottom. The glass tubes are at the lower end curved in the direction of the sides of the glass vessel, and at the other end, before they pass through the top of the vessel, they are cemented in a stout metal tube. The glass vessel is placed in a somewhat larger vessel of sheet zinc, which can be covered light-tight by means of an overlapping cover sliding in a groove. The cover in its centre has an aperture provided with a short tube, through which the metal tube bearing the glass tubes projects so far that india-rubber tubing for the introduction of the water can be attached to it. In order to prevent the glass tubes from being broken by pressure in attaching the india-rubber tubing, they are fixed by an adjusting-screw affixed to the short tube in the aperture of the cover. At the upper end of the india-rubber tubing a sufficiently large funnel is placed, which is suspended by means of cords to the water-tap. The number and diameter of the glass tubes depend on the size of the washing bottle, and on the quantity of emulsion to be regularly worked.



The Acid Eikonogen Developer.—It has been found by some experimentalists that the keeping qualities of the eikonogen developer are much improved if it is made acid, or nearly so. With regard to this, the following formula is recommended by Mr. T. H. Voigt, chairman of the Photographic Society of Frankfort-on-Maine:—

Solution No. 1.

Water	...	500 c.c.
Sodium sulphite	...	25 grammes
Eikonogen (previously pulverized)	...	5 to 6 ,,

As soon as the eikonogen has completely dissolved, 20 c.c. of a mixture of 500 c.c. of a saturated solution of sodium

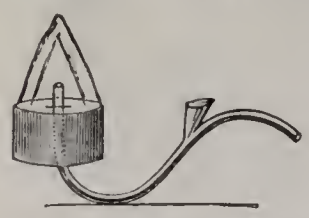
sulphite, and 40 c.c. of hydrochloric acid, are added to the above (Solution No. 1).

Solution No. 2.

Water...	500 c.c.
Carbonate of soda	20 grammes
Carbonate of potash	5 ,,

To develop a cabinet plate, 30 c.c. of solution No. 1 are poured over the plate in the dish, and the latter is well rocked, so that the plate is entirely covered by the solution. Previously 10 c.c. of solution No. 2 have been poured into a measure; if it is probable that the plate has been over-exposed, at first 5 c.c. of solution No. 2 are added to the developer in the dish; if, however, it is found that the plate has been correctly exposed, the remaining 5 c.c. of the alkali solution are also added. It will be noticed that with this method of development only about one-third the quantity of the alkali which is usually taken is used. It seems that the minute quantities of the chloride of soda and chloride of potash, which are formed by the addition of the hydrochloric acid, increase the energy of the developer.

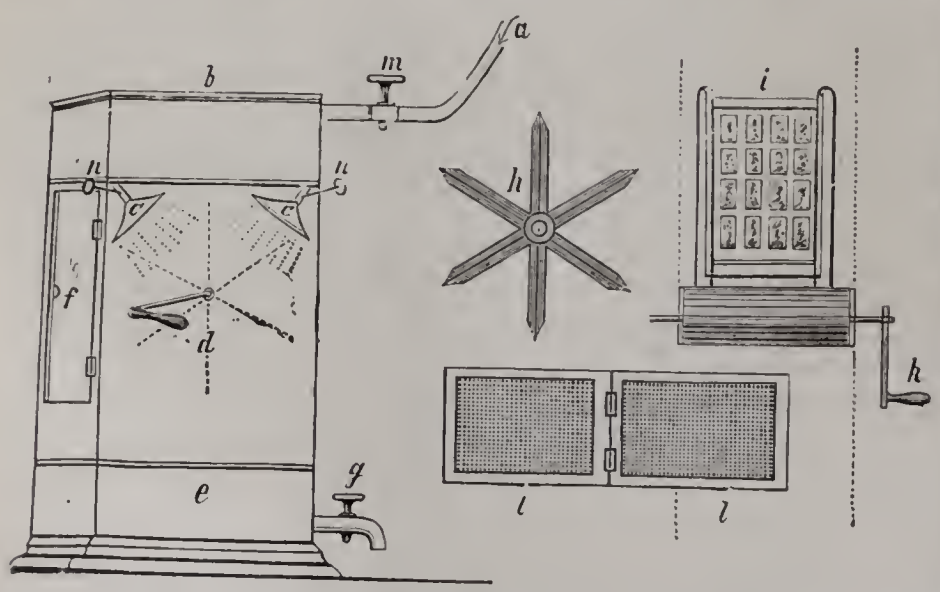
Cheap and Effective Flash-Lamp.—The following instrument, of which I give a sketch, is said by Herr Sasse to give as good results as the more elaborate and expensive lamps which are in the market. It consists simply of a curved tube provided with a small spirit reservoir, which is filled with cotton-wool, and of a small funnel for dropping down into the curved tube dry magnesium powder. To the end of this tube an india-rubber tube, with ball attached, should be fitted. The size of the spirit flame can be regulated by pulling out the cotton-wool more or less.



Chloride of Iron as a Restrainer.—A. Einsle has found that chloride of iron forms an excellent means of saving over-exposed plates. If a plate which has been exposed five times too long is placed before development for two minutes in a ten per cent. solution of chloride of iron, then rinsed under the tap, and then developed, a vigorous negative, full of contrast, is obtained. Dr. Miethe suggests in the case of hydroquinone and eikonogen development the washing of the plate thoroughly, in order to prevent the staining of the negative.

Eliminating Hyposulphite of Soda.—Dr. A. Bannow publishes in Prof. Eder's year-book a series of most careful and interesting experiments which he has made in order to ascertain the method by which hyposulphite of soda is eliminated most efficiently and thoroughly from negatives and prints. The results of these experiments, which are too extensive to be reproduced in full, are the following:—Washing in a current of water is more efficient than the washing in several changes of water; the bulk of the hypo is soon removed, but the last traces stick very obstinately. After the pictures have been washed in five to six changes of water after they have been washed for one to two hours in running water, they may practically be taken as freed from hypo. Paper prints are freed from hypo a little sooner than gelatine plates: they are, however, more sensitive to its action on account of the smaller quantity of silver they contain. The various substances which are from time to time recommended to accelerate the washing process—as, for instance, alum, common salt, and chloride of lime—are unnecessary, and even doubtful, inasmuch as it has not yet been proved that their action upon the small quantity of silver contained in the pictures is not an injurious one.

Washing Apparatus for Prints.—A skilled photographer of Braunau, Mr. J. F. Klinger, has for his own purposes constructed the following washing apparatus for paper prints. It consists of a wooden box *d*, about 6 feet high, 34 inches broad, 16 inches deep, lined inside with thick sheet zinc. The box consists of a small water-reservoir *b*, with roses *cc* attached, and at the bottom it has another reservoir *e*, in which the waste water is collected, and which is provided with a delivery-cock *g*. The centres of the side of box support the winch handle of the rotating paddle-wheel *h*. To the shaft of the handle, at each of its two ends, are fitted six wooden carriers provided with a groove: these serve as carriers of the horse-hair slides *ll*. One of the horse-hair slides, after it has been inserted in the apparatus and covered with prints, is shown in the sketch by *i k*. As soon as all of the six slides have been covered with prints, they are inserted in the grooves of the carriers at the small door *f*; the latter is then shut, and the apparatus is ready for use. At first the water is turned on by means of the tap *m*; then the valves *n* of the roses *cc* are adjusted, and the handle is turned. Mr. Klinger asserts that, by means of this washing arrangement, the prints are soon entirely freed from all traces of hypo, and that they are never injured.



Fotografi-Foreningen i Upsala.—This Society, founded at the beginning of the year, now numbers thirty-eight members. Its president is Dr. E. Duner, who informs us that he has just learned that the Swedish Parliament has afforded the means for fitting the observatory under his charge with a photographic refractor of thirteen inches aperture, so that in 1892 he expects to be able to do good astro-photographic work.

A PHOTOGRAPHIC UNTRUTH.*

BY CAPT. W. DE W. ABNEY, C.B.

When pressed by the Secretary of the Camera Club for the title of my paper, I was at a loss to know what to give. I felt that as your President you would have quite enough of my voice, and thought it hardly fair that I should read a paper at all. However, on the spur of the moment, I put down "A Photographic Untruth" as the heading—not for any sensational purpose, but because I knew that there were many untruths perpetrated by photography, any one of which might well be treated of. The particular untruth I am going to touch upon to-day is the untruth of form which a photograph gives when judged by depths of light and shade. A dead white cylinder standing vertically and illuminated by horizontal parallel rays of light, or by what is equivalent, by light projected from a point at a long distance from it, in a dark room, is a good example of what I mean. The part of the surface which will be most strongly illuminated is the line where a plane passing through the axis of cylinder and parallel to the rays of light cuts that surface. If the illumination of the vertical line be expressed by I, then the illumination falling on any other vertical line can be theoretically expressed by the formula $I' = I\cos\theta$, where I' is the illumination required to be found, θ is the angle between the plane passing through the axis and parallel to the direction of the light and a plane passing through the axis with the part of the cylinder whose illumination is

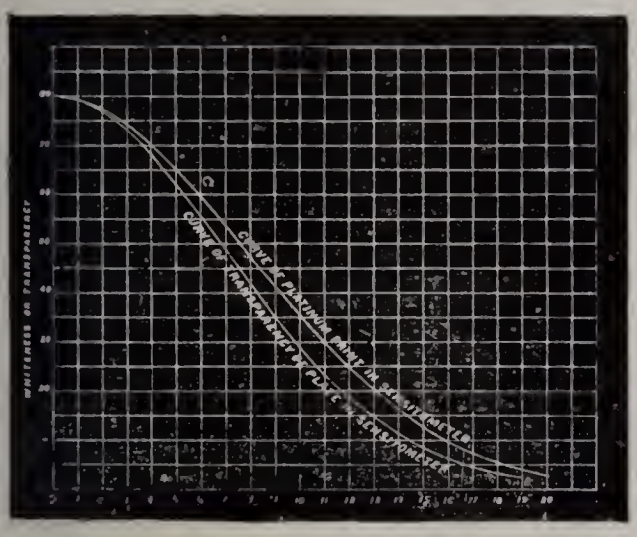


Fig. 1.

required. This is evident: let AB be a section of one plane of a length unity, BC be the section of another plane of the same length, but inclined at an angle θ. The light falling on AB in a perpendicular direction is evidently more than the light falling on BC, though it is the same length. Simple mathematics show that the light thus falling on the surface is BC $\cos\theta$, and the illumination of BC is therefore to that on AB as $\cos\theta : 1$. A little more simple elementary geometry will show that the inclination of the surface of any cylinder to a fixed part is the angle made by the two radii, and therefore this law applies in this case.

Instead of a cylinder, I have taken a polygonal prism of twenty-four sides illuminated as described, and calculated the illumination which is given to each side, and I have supposed that one side is exactly perpendicular to the path of the rays of light illuminating it, the other sides lying symmetrically around it. From the curves of gradation in a negative, as given in the *Photo. Journal* of last November, of which one of the curves in fig. 2 is a transcript, the transpareney of the images of the different sides, as shown in a negative which could be taken from it, have been calculated, and then from these transparencies the amount of white in a resulting platinum print, for every side exposed to the light, or the amount of white has been deduced from a curve of the gradation from a platinum sensitometic print (fig. 1). Taking the amount of whiteness of the lightest side as unity or 1, I have calculated the angle that the side should make with this side (which is perpendicular to the direction of the light), and constructed the polygon in fig. 2, remembering that the projections of the angles of the polygon must always be the same.

The following table gives the theoretical illumination. The side No. 1 is that on the left or right, and is parallel to the beam:—

THEORETICAL ILLUMINATION OF THE DIFFERENT SIDES OF THE POLYGONAL PRISM.

	Inclination.		Numerical Value.
No. 1 and 13 ...	cos 90 ...	=	0
„ 2 and 12 ...	cos 75 ...	=	259
„ 3 and 11 ...	cos 60 ...	=	500
„ 4 and 10 ...	cos 45 ...	=	707
„ 5 and 9 ...	cos 30 ...	=	866
„ 6 and 8 ...	cos 15 ...	=	966
„ 7 — ...	cos 0 ...	=	1,000

If in fig. 1, 1,000 be taken as 15 on the scale, that is, the intensity is $\sqrt[3]{2^{15}}$, the following table is arrived at for the transparency of the negative for different sides of the polygon. This number on the scale is chosen as giving a negative fairly dense for the whitest side.

No. of sides.	Illumination.	Value on scale of fig. 1. $\sqrt[3]{2^{x}}$	Relative transpareney of negative.
1 and 13	0	0	80·0
2 and 12	·259	9·1	34·0
3 and 11	·500	12·0	18·0
4 and 10	·707	13·54	12·5
5 and 9	·866	14·4	9·6
6 and 8	·966	14·9	8·4
7 —	1,000	15·0	8·2

It must be remembered that sides No. 1 and 13 are not visible, so cannot be taken into account.

From such a negative we can take platinum prints, and knowing the value of the transpareney, we can calculate the whiteness of each side as it would be rendered.

Supposing 80 to be the greatest transpareney of the negative we have produced theoretically, and that we take the whiteness of the print produced with this transparency to be 5·6 (white being 80), then 80 corresponds to No. 18 hole of the sensitometer, or $\sqrt[3]{2^{18}}$. We then get the following table:—

No. of Sides.	Transparency.	Value on scale of platinotype curve.	Amount of white, 80 being maximum.	Taking 46·5 as white, or 1·000	Angles whose cosines are those in Col. V.	Original angles, corresponding to these.
1 and 13	80·	18·	5·6	·120	83°	90°
2 and 12	34·0	14·5	14·0	·301	72°30′	75°
3 and 11	18·0	11·6	26·0	·559	56° 0′	60°
4 and 10	12·5	10 0	35 0	·752	41°46′	45°
5 and 9	9·6	8·8	42·5	·913	24°30′	30°
6 and 8	8 4	8·3	45·5	·978	12°25′	15°
7 —	8·2	8·1	46·5	1·000	0	0°

* Abstract of a paper read before the Camera Club Conference, and published in the *Journal* of the Club.

Nos. 1 and 13 are not seen, so in constructing the polygon in the diagram these sides have been shown as the original lengths. It must be noticed here that the photograph shows the side No. 7 as a mixture of more than half white with rather less than half black, so the print would look very grey.

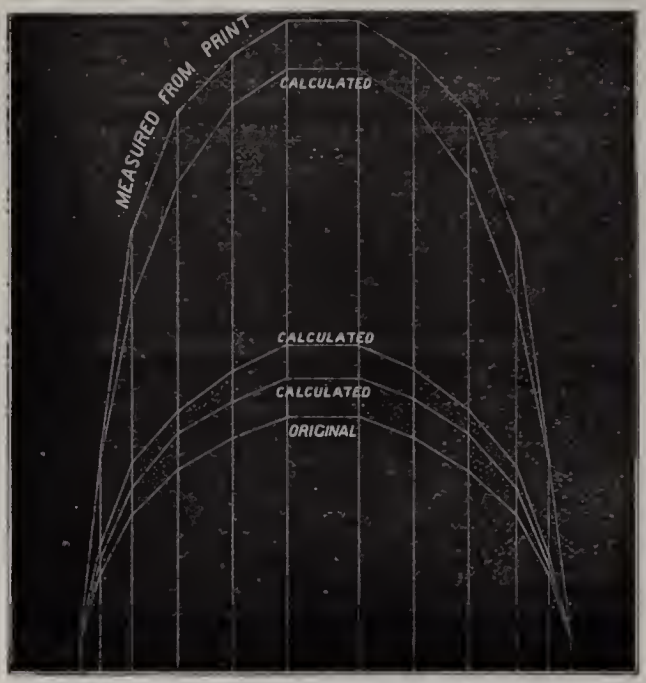


Fig. 2.—Sections of Polygons.

In the two outside polygons the lightest side is nearly pure white.
In the two inside calculated curves the lightest sides are dark grey.

We can, however, take a lighter print. If we take 80 transparency as represented by 12 on the scale of the platinotype curve, we get the following table:—

No. of sides.	Transparency.	Value of scale of Platinotype curve.	Amount of white, 80 being maximum.	Taking 77 as white, or 1·000.	Angles whose cosines are those in Col. V.	Original angles corresponding to these.
1 and 13	80·	12·	24·	·322	71°12′	90°
2 and 12	34·0	8·2	46·5	·598	53°50′	75°
3 and 11	18·0	5·5	62 5	·812	35°40′	60°
4 and 10	12·5	4·0	70·5	·916	23°30′	45°
5 and 9	9·6	2·8	75·5	·981	10° 0′	30°
6 and 8	8·4	2·25	76·5	·994	6° 0′	15°
7 —	8 2	2·15	77·0	1·000	0°	0°

As before, 1 and 13 are hidden, so are shown of original length in the diagram.

Here the print is nearly white as regards side No. 7, but the shading is incorrect as before.

The nearest approach to correctness tried is when 80 is made to be of the value of 21 on the scale of the platinotype prints, when we get the following results:—

Sides.		Calculated angles.		Corresponding angles in original.
1 and 13	...	84	...	= 90
2 and 12	...	76·50	...	= 75
3 and 11	...	60·30	...	= 60
4 and 10	...	45·34	...	= 45
5 and 9	...	28·55	...	= 30
6 and 8	...	11·20	...	= 15
7 —	...	0	...	= 0

But in this case the whiteness of the whitish side No. 7 is only $\frac{2}{8}\frac{1}{0}$ of pure white, and is, consequently, a very grey dull print, which no one could accept. A model of the polygon was illuminated as described and photographed in a dark room, and a print taken from the negative, which experts judged satisfactory. The blackness of the different sides was measured, and the results are given in the following table, and is also shown in fig. 2.

Three different depths of printing are here given:

No. of sides.	Whiteness measured.	Whiteness with maximum 1	Angle whose cosines are those of Col. III.
1 and 13	0	0	0
2 and 12	6·5	·08	4° 30′
3 and 11	10·6	·14	8° 10′
4 and 10	24 0	·32	19° 0
5 and 9	50·0	·67	47° 30′
6 and 8	69 0	·92	67° 0
7 —	75 0	1·00	90° 0

Pure white in this case was 80.

The following table gives the values of the curves for the negative and for the platinum print; see fig. 1:—

No. of hole of Sensitometer.	Transparency of Platinotype.	White in Platinotype.	Remarks.
0	80	80	
1	79·2	79 3	Each hole of the sensitometer diminishes $^3\sqrt{2}$.
2	76 8	77·0	
3	74 0	74·3	
4	68	70·2	
5	62·1	65·2	The curves of the negative and platinotype print each follow the curve given by $I' = Ie^{-\mu x^2}$, I being the intensity of the No. 0 hole, I′ that to be found, μ a constant, and x the number of the hole.
6	55·5	59·6	
7	48·7	53·5	
8	41·8	47·3	
9	35·1	41·2	
10	29·0	35·2	
11	23·4	29·7	
12	18·5	24·6	
13	14·4	20·1	
14	10·9	16·0	
15	8·2	12·6	
16	5·9	9·8	For the negative, $I=80, \mu=·01015$.
17	4·25	7 5	
18	3·0	5·6	
19	2·0	4·0	For the platinotype print, $I=80, \mu=·0082$.
20	...	3·0	
21	...	2·5	

It will thus be seen that, judging by shades, photographs give no correct rendering of slopes, and no matter how the light is altered by reflectors and so on, untruth must always be present. A painter can afford to do with one light to illuminate his sitter, a photographer uses reflectors to lighten the shadows. If not lightened, the tendency is to make the head look deeper than it really is.

A very good plan of demonstrating this untruth in photography is by photographing discs, some rotating and some still. The accompanying figure shows what is meant (Fig. 3). The two outside rings contain each one part of black and two of white, whilst the two inside ones contain two parts of black and one of white. It is easy to arrange cards so that the two centre ones shall rapidly rotate, and the innermost and outermost remain fixed. In the negative representing these and in subsequent prints, we shall have two grey rings, bounded by rings made up of black and white segments. If photographic representation were true, then on rotating the print obtained round its centre the innermost and outermost rings should give the same greys as the rings next to them. No variation in the intensity of the negative nor in the depth of print will give this result. One ring will always be darker or lighter than that which it should match, even when the printing is carried on so far that a match is made in the other. A

further development of the plan is to rotate the original sectors with the different proportions of black to white, that containing the two-thirds white outside the photographed discs, and the other within them. We then have three rings containing what should be the same proportion of black to white in both cases, and which should give the same grey. It is found that none of them will probably match, or that if two rings of grey of one set

Fig. 3.

match, the other one differs from them, and in the other set of three rings they will all differ.

One word in conclusion: let it not be imagined that the untruth appears only when one direct light is employed. The same differences will exist however an object is lighted, but the lighting may be so modified to the eye that it may appear fairly correct in the photograph, but for totally different lightning.

SELECTING A LENS.*

BY J. K. TULLOCH, M.B.

In order to come at the optical aids which the average amateur requires, let us consider what will be the probable work he will undertake. First, then, landscape pure and simple will probably be the chief item; secondly, he will ere long want to do a little instantaneous photography; thirdly, architecture, including interior work; fourthly, portraiture, either in a common sitting-room, or perhaps out of doors. Now, the problem to be solved is this: How to provide one's self with the necessary lenses at the least cost, and at the same time with no sacrifice of efficiency. Let it be understood that the arguments to be advanced hold equally well whatever the size of plate.

In order, however, that it may be easily followed, let us say that a half-plate kit is in view. For a half-plate, opticians generally advise a rapid rectilinear of about nine inches focus, that is if only one lens is to be supplied. This, to my mind, is a very absurd proceeding, and for the following four reasons:—First, while, of course, it is rectilinear for a half-plate, or any other plate it can cover, a cheap single lens is also rectilinear on a half-plate, that is if it is about nine inches focus—the same focus as the rectilinear. Second, a rectilinear is much more expensive than a single lens. Third, a rectilinear of nine inches focus is made up of two achromatic combinations, each of them so long in the focus that they cannot be used singly in any ordinary camera; add to this that they are generally symmetrical, that is, of the same focus, and even if you can use one the other is never of any service. And the fourth reason is that the focus is too long for wide-angle subjects, and you need another lens to take them.

A much better bargain—so to speak—can be made than this; but before propounding my own ideas on this matter, it might be as well to explain to the uninitiated why lenses have to be of different lengths of focus.

Since light travels in straight lines, a certain size of plate being given, the focus of the lens directly determines the amount of subject included; or, to use the proper expression, the focus of the lens and size of plate together give the angle included by the lens. A short-focus lens includes a wide angle, and a long focus lens a narrow one. A lens which would give a wide angle for interior work would be of little use in the great bulk of landscape work, for it would include too many objects at the expense of the *size* of these objects. A lens of long focus, first class for sea or hill subjects, would be useless for interiors, for a long-focus lens renders the various objects of such a size that but few of them can be represented, and in place of getting a representation of a whole room, one would barely get in the whole of the end wall. One could do with a great many lenses of different foci, but practically in landscape work generally, including exterior and interior architecture, a choice of three lenses of different foci is sufficient.

Granted, then, that the necessity for different lenses is allowed, what does experience suggest as to the focus for each of the three lenses, and is it possible to get one combination to give the whole three? We have seen that to have a nine-inch rectilinear as an *only* lens for a half-plate ties you down to having only one focus, for the two halves of the lens cannot be used singly on account of their extreme length of focus; therefore this does not fulfil the required conditions. If, however, we substitute a wide-angle rectilinear in place of a rapid rectilinear, we will have attained our object almost at a single step. Let a wide-angle rectilinear of, say, four and a half inches focus be chosen for a half-plate, and the following advantages immediately accrue.

First: Used just as it is—that is, both combinations together—it makes a first-class short-focus lens for a half-plate, including a wide angle, with great depth of focus and perfection of detail all over. In this shape it is the very thing for interiors and cramped exteriors, such as buildings in closes or narrow streets, and, of course, it is strictly rectilinear. The two halves used separately (and the mount is always arranged so that they may be) give other two foci of about eight and ten inches. Now, on a half-plate an eight-inch and a ten-inch single lens are to all intents and purposes rectilinear, so that we have in this one combination a choice of three different foci, all of them rectilinear on a half-plate.

But, it may be said, what are the disadvantages of this system, for surely everybody would adopt this were there no equally powerful drawbacks? It has only one drawback, and that is its want of rapidity. I have two answers to this: first, the double combination is rapid enough for all ordinary instantaneous work; and secondly, even if

* Abstract of a communication to the Dundee Photographic Association.

it were not, a single lens can be purchased for a mere trifle capable of taking up the instantaneous and portrait branch of the subject. All the finest professional instantaneous work has been done with lenses working no quicker than this, and I myself find that for street views, including moving figures, the lens is amply quick enough. For certain optical reasons a small stop, that is, a comparatively small stop, has to be used with wide-angle lenses, and this prevents them being the most rapid form of lens, but their other good qualities far more than make up for any loss of rapidity, that is, always supposing the very highest degree of rapidity is required.

Assuming, however, that it be allowed that this wide-angle combination is the best for landscape and architectural work, but that a quicker lens is necessary for portraits and instantaneous views, what lens should be recommended? During the winter that is past I have been much pleased with the working of plano-convex lenses. Those who have not experimented somewhat have no idea how interesting a field this is. Compared with the meniscus form, which is the usual form of single lens, I find that the plano-convex works with a much larger aperture, giving excellent definition, but this through a somewhat restricted field. Given a meniscus and a plano-convex, I find that if they are of the same focus the plano-convex will give crisp definition for a certain space, while the meniscus will give a far blunter image, but not falling off in defining power so rapidly towards the edges.

But in these days of enlarging from small negatives, the plano-convex is just what is wanted, for it matters little what size the negative is if it is very good, what there is of it. The moving object in instantaneous work generally occupies only a very small part of the field, and the plano-convex is the very thing for this. Again, in portraiture, what though the shoulders and draperies be a little blunt, if the head, the centre of attraction, be faultlessly rendered.

A good plano-convex lens will work as rapidly as ninety-nine per cent. of the rapid rectilinears, while the cost is not a fourth part.

It is perfectly astonishing to me why this most excellent form of lens has been in abeyance so long, unless on the assumption that its narrow angle has prejudiced workers against it. Of course, it must be understood that I only strongly uphold it in such cases as are of narrow angle naturally, such as portraiture and instantaneous work.

But it might be argued that by this system the wide-angle lens in its double form would be but rarely used, while one would constantly be working with a single lens. This, of course, is quite true, but there is no determent in this. Lantern work, which, of course, requires negatives of the highest degree of sharpness, is a good test for any lens, and the whole of my very finest slides are from negatives taken by a single lens, and leave absolutely nothing to be desired in fineness of detail.

To recapitulate, then, I think that an amateur who would have a thoroughly reliable battery of lenses requires nothing more than, first, a wide-angle rectilinear with a focus of about two-thirds the long diameter of the plate, and secondly, a simple achromatic plano-convex lens with a focus about one and one half times the long diameter of plate. The wide-angle lens will give him three different foci, all practically rectilinear, and as good as can be made for all kinds of photographic work, except the fastest instantaneous and portraiture. The plano-convex lens will give him a fourth focus for landscape, and at the same time be an instrument second to none for the quickest instantaneous work and portraiture.

I am not advising a system which has been imagined but never tried. The arrangement described is precisely the one which I have used myself for years, with the exception of the plano-convex lens, the splendid properties of which I have only been acquainted with for the last six months past. With regard to everything else proposed, I may say that with a photographic experience ranging through every branch of the subject, I have never once failed through not having a proper lens. I have since got a plano-convex suitably mounted, and feel now quite at ease whatever kind of work I determine to undertake, although I must say I never had any difficulty in instantaneous work, using my wide angle lens at full aperture, which is about *f*-16.

It must not be understood that I advise cheap lenses from second-class makers—nothing is further from my purpose. I wish rather to point out that a suitable choice of *one* first-class lens will do all the work of three equally expensive instruments; that the economy comes in in carefully choosing one good lens that is capable of overtaking all the work, rather than being at the expense of three separate instruments that can do no more than the one, provided it be intelligently chosen.

A few words may be said as to the more material side—I mean the actual workmanship of a lens. The brass work should be first-class. In second-class lenses this is frequently defective. Threads of screws should be clean cut and not too fine. The diaphragm or diaphragms should fit the slot accurately, neither too tight nor too easy. If the diaphragms be the ordinary Waterhouse ones, there should be guides to the very bottom of the slot, so that the diaphragm when pushed home may be properly centred.

The Iris diaphragm is better than Waterhouse, but inferior to rotating, where this form can be used, which is not always. I have no special objection to Iris diaphragms when dealing with larger apertures, but when the light is shut off from *f*-32 to *f*-60, a very trifling error in the adjustment may seriously increase or diminish your exposure.

A wide-angle rectilinear, such as I have recommended, is invariably fitted with rotating diaphragms, and in having it screwed to the camera, care should be taken to have the diaphragm slot on the *under* side (not the *upper*), so as to prevent or lessen the chance of light getting in where it is not wanted. When the lens is not in its place in the camera, it should be kept covered at both ends—a screw cap being generally provided for the one end, and the ordinary exposing cap for the other.

Photographic Convention of the United Kingdom (Lens Standard Committee). — Opticians and all interested are invited to a meeting to be held at the Mona Hotel, Henrietta Street, Covent Garden, on April 25th, 1890, at 7·0 p.m., to discuss the desirability of adopting and further defining "The Lens Standards of the Photographic Society of Great Britain." —April 14th, 1890, by order of the Committee, A. Haddon.

At a lecture, by Mr. Henry Blackburn, Editor of *Academy Notes*, to be delivered at the Kensington Town Hall, on Friday, April 18th, at 8 p.m.; and at the Eyre Arms Assembly Rooms, St. John's Wood, London, on Friday, April 25th, at 8 p.m., a series of instantaneous photographs, taken lately in Algeria and Morocco, will be shown by the oxy-hydrogen light.

ON PHOTOGRAPHY BY THE LIGHT OF THE ELECTRIC SPARK.*

BY LORD RAYLEIGH, SEC., R.S.

I HAVE long wished to illustrate by instantaneous photography the many curious phenomena attending the resolution of liquid jets into drops, and the subsequent behaviour of the drops during collision; but it is only recently that I have carried the desire into effect. In order to secure good definition, the exposure needs to be

Fig. 1.

less than 1-1000th second, and in some cases 1-10000th second. For this purpose the light attending the discharge of Leyden jars seemed to be the most promising.

There is no difficulty, of course, in getting a photographic image of the spark itself, for in this case the light is concentrated upon a very small area of the films. But in order to photograph upon a satisfactory scale other objects by the light of the spark, the whole illumination has to be diffused over an area of several square inches of sensitive surface. Under these circumstances it requires special arrangements to secure a sufficient chemical action.

The spark is taken between brass balls enclosed in a magic lantern. The light issuing from the condenser, still slightly divergent, falls at a distance of sixteen feet

Fig. 2A.

upon a large single lens of about ten inches diameter, which plays the part of a field-glass. The photographic lens, a large portrait combination by Dallmeyer, is situated about seven feet behind in the image of the lantern condenser as formed by the field-glass, and is just large enough to include it. The jet to be photographed is placed parallel to the field-lens, and as near as conveniently may be upon the side next the photographic camera. The preliminary focussing of the image upon the ground glass cannot well be effected by the light of the sparks. For this purpose a candle, which may stand before the lantern condenser, is substituted.

In the earlier experiments, where jars of small capacity only were available, the images were found, on development, to be under-exposed, although the impression made upon the eye by the image upon the ground glass was sufficiently startling. In later work at the Royal Institu-

Fig. 2B.

tion, I have had the use of a large Leyden battery charged by a Wimshurst machine, and there has been no difficulty in securing sufficient exposure.

The photographs illustrate the behaviour of fine, nearly vertical fountains, and the modifications which they undergo under feeble electrical influence. In the normal condition (Fig. 1) the drops on collision rebound, and are thus scattered about over a considerable space. Under the action of electricity the drops coalesce upon collision, and thus in place of a large number of small drops the photograph shows (Fig. 2A) a smaller number of widely-separated conglomerates. It is evident that the electrification has no effect upon the original separation of the liquid column into drops.

Another set of photographs shows the details of the resolution of a larger jet (Fig. 2B). In this regularity is promoted by the operation of a tuning-fork.

* Abstract of a paper read before the Camera Club Conference, and published in the *Journal* of the Club.

THE annual dinner of the employées of Messrs. Wm. Watson and Sons, of 313, High Holborn, took place at the Holborn Town Hall on Saturday evening, March 12th. Mr. T. P. Watson occupied the chair, and in the course of his remarks mentioned that it was was usual for that dinner to be held at the beginning of the year, but owing to the prevalence of influenza, which rendered it impossible for many to attend whom they would not like to be absent, it had been deferred till the present. In proposing the toast of the cabinet workshop, the chairman spoke in warm praise of the work it turned out, although he felt that the microscope shop this year took the palm. The toast of the visitors was responded to by Mr. Traill Taylor, who endorsed the chairman's remarks. During the evening a capital programme of songs and recitations was gone hrough.

Notes.

A picture by Mr. Carl Haag, in the forthcoming exhibition of the Royal Society of Painters in Water Colours, will excite the attention of the photographers who gather there at the meetings of the Photographic Society of Great Britain. It represents the portrait of the chairman of one of the city companies in his official robes, painted in the full blaze of sunlight—an effect, it is said, which, as far as the artist knows, has never been attempted. This assertion is probably correct so far as portraiture is concerned, but surely artists have attempted the effect of sunlight on faces before now. Photographers have gone beyond this, for experiments with the face in full sunshine have been made many times with more or less success. Anyway, Mr. Haag's picture will be regarded with some curiosity by those who know the difficulty of the task.

It is strange to find the naval authorities moving with the times. They have certainly done so in a new and unexpected use which they have found for photography. The important question of the salute has been occupying their minds, and they have decided that for the future there is to be no doffing of hats, but, from the second-class boy to the post-captain, the salutation is to be performed by raising the hand to the cap, somewhat in the military fashion, but with a slight difference. So that there shall be no mistake about the matter, they have had a man photographed in the correct attitude, and a copy has been sent to all the harbour ships. This is an excellent idea, and one that we should not have thought "my Lords" would have adopted, as it is a total departure from the old form of issuing instructions. But photography now-a-days finds its way everywhere.

The latest royal devotee to the art of photography is the Duke of Aosta. Instantaneous photography is one of his hobbies, and we read that his small pocket camera is held in horror by the ladies of the household, who know that they might be taken at any moment without time to arrange themselves in a graceful pose. We trust this is an exaggeration; but there is this comfort, that the ladies who are thus tormented have the means of revenge within their power. The domestic gimlet or bradawl skilfully applied will at once render the efforts of the amateur abortive, and send him distracted.

The Chinese have a knack of anticipating every European discovery. It might be supposed that thought-reading was exclusively our property, or, at least, the property of America; but, according to a recent traveller, the Chinese have gone a long way beyond the reading of thoughts, as they have succeeded in photographing them! A Mr. Horace Jones tells how he was taken to a joss house, where prepared papers were applied to his head. The result was that his thoughts appeared in pictorial fashion, but unhappily faded in about half-an-hour. Thus, we are told, though the art has been known to the Chinese priests for some 3,000 years, yet they have never succeeded in fixing these thought pictures. Travellers are credited with telling very wonderful stories, and this certainly is one of the most wonderful.

Complaints are being made in New York that not only are prints from portrait negatives of attractive ladies being sold to the general public, but that the detective camera is freely used to obtain portraits surreptitiously. These photographs are afterwards used for the adornment of advertisements or for the decoration of packets of cigarettes. A correspondent of the *New York Nation* wrote recently in great indignation complaining of the practice, and proposing that a short statute should be passed prohibiting the publication of a photograph without the consent of the subject. We do not know how the law may be in America, but we should fancy that if such a practice were at all in vogue in England, some means would be found to reach the offenders. An injunction to restrain the publication would certainly be at once granted by the Court of Chancery.

A Mr. A. P. Laurie claims that he has solved the difficulty of preventing paints used by artists from fading. His experiments have been in the direction of obtaining a medium which is unaffected by moisture, and he has made a varnish out of sulphate of copper which, after drying, remains perfectly colourless. No doubt damp is a great factor in the fading of paintings, as it is in the fading of photographs, but it is not the only factor. Unquestionably the action of light causes a reaction between the chemical constituents of the various pigments, which a colourless, damp-proof varnish cannot arrest. What would seem to require study is the chemistry of pigments, so as to know the effect of light on two or more pigmentary compounds when mingled together. In this direction much has to be done.

M. Léon Brin, whose oxygen-making process is so well known, and which has proved of such great use to photographers, has for a few years past been residing in London, and has been largely engaged in experiments relating to the cheapening of the manufacture of alloys of aluminium direct from the ore of that metal. In early times he gave some attention to photography, and he made some photographic lenses by specially devised machinery; in those times, also, he was acquainted with Niepce de St. Victor. He informs us that he was the inventor of butterine, and considers that compound to be a boon to mankind, because in it the poor man gets something as good as butter at a cheap rate, and the rich man obtains genuine butter at a reduced price.

COLOUR SENSATION.*

BY CAPT. W. DE W. ABNEY, C.B.

Though we know not the "reason why" of colour sensation, we yet know that there are three distinct colour sensations, the existence of which I have heard so eminent a physicist as Lord Rayleigh say is as well proved as the law of gravitation. I may add that I am one who boldly accepts the theory of trichromatic vision in a normal eye, and hold it as being sound physiological physics. But what has this to do with photography? Just this, that the same theory that applies to the sensitive retina may equally well apply to the sensitive plate. The eye, *i.e.*, its retina, is sensitive to three primary colours, red, green, and violet, and if we take the spectrum we find that any

Fig. 1.

intermediate colours can be compounded of two or more of these three colours. Thus the orange sensation is caused by a combination of the red sensation with green sensation, and the blue of violet and green. Further, when we come to show graphically on paper the curves of luminosity of the three different sensations to the spectrum, we cannot but be struck with the similarity that they bear to the curves of sensitiveness of the different salts used to register the photographic image

Fig. 2.

There is no difficulty in taking in the fact that some one particular wave-length can cause one sensation in the eye, but it is harder to understand that another wave-length not differing much from it can give rise not only to the same sensation, but to one or two others. The theory of sound, however, helps us in the first case. When one tuning-fork is not quite in tune with another, the one sound from one will reinforce the other to a certain extent, but as the discordance increases the reinforcement becomes less and less, and finally vanishes altogether. So with waves of light; the waves which are in exact accord with one part of the machinery (whatever it may be) in the eye will produce a maximum effect, producing eventually a motion which gives rise to the impression of a primary colour. The waves which are slightly longer or shorter than this will be only capable of giving a smaller amplitude of vibration to the same part of the apparatus existing in the eye, and consequently less intensity of that particular colour sensation, till finally, as the wave-lengths become shorter and longer, the amplitude of vibration in that machinery becomes nil or imperceptible. But at the same time that part of the machinery which is exactly in accord with another wave-length, and is, consequently, another colour-sensation, may also respond to the same wave-lengths as those which partially affect the machinery answering to the first colour sensation, and for the very same cause, though it may be to a greater or less degree. Thus the same wave-length, which is not in true accord with either, may cause both colour-perceptions to respond.

The same argument applies to three colour-perceptions, and would do so to more if they existed. Now a sensitive plate may be said to take the place of the retina, and the sensitive salts used to a colour-perceiving tissue. The simple salts have but one colour-perception, but where two salts are mixed, we may have two perceptions, and when dyed plates are used, we may have two or three colour-perceptions. Even where one sensitive salt, the silver bromide, has been used, I have traced three distinct colour-perceptions, or, to speak more accurately, radiation-perceptions, one situated in the violet, near G, another in the green, between F and E, and the third in the red, and extending into the infra-red. The places of maximum sensitiveness in the three correspond to three simple colour-perceptions, but not situated in the same place in the spectrum as those of the eye. These curves, however, differ from those of the eye colour-perceptions, in that whilst the curve of luminosity of the spectrum arrived at by compounding the latter is a smooth curve, the former is not; but the curve of photographic sensitiveness is in a series of hummocks or ridges. We can find something similar in some eyes; for instance, where there is a slight deficiency in the perception of green. Again, there is this difference, that whilst in the eye the luminosity curves of the red and green are the greatest, and the violet the smallest, in the silver bromide, the violet is the largest, and the green and red the smallest. In fact, when the colour-perceptions of the eye are altered in their proportions, by looking through a pale blue solution they are very much the same as those of the photographic film already alluded to. It may be asked how and what am I driving at, and my reply is that I think that the photographic spectrum curves of sensitiveness are analogous to the spectrum curves of colour-perception in the eye, or, in other words, that a photographic plate has, in reality, only one, two, or three colour-perceptions, and that all sensitiveness to other colours is due to only partial response of the vibrating atoms in the molecule to wave-lengths which differ slightly from those with which one or more perception is in accord. A study of the simple mixture of the haloid salts favours this view, and I believe that by using it as a working hypothesis, a better understanding of the apparent vagaries in the extent of sensitiveness will be attained.

I would here add that the generally adopted physiological interpretation of colour perception is one which is very open to discussion. It can scarcely be conceived that even the delicate rods and cones of the retina are not much too coarse to be primarily affected by waves of light.

* Abstract of a paper read before the Camera Club Conference, and published in the *Journal* of the Club.

In the ear there is an equally delicate mechanism which is affected by vibration in the air; and we can scarcely expect the mechanism in the eye to be responsive to vibrations infinitely more rapid, and in a medium infinitely more subtle. Probably it will eventually be found that light acts on matter to produce a chemical change in it, and that the change so produced is capable by electrical currents to set in motion the mechanism required to give the sense of colour. This, however, is travelling beyond the limits I have set myself to keep, and I leave it there.

I have to ask those of you who are interested in theory to take this hypothesis into your consideration. My late researches into the sensitiveness of various compounds recently published by the Royal Society have made me offer it to this Conference.

Quite recently we have had an announcement that a Herr Veresez has achieved photography in natural colours, and that it is a printing process. In the paragraph which appeared in the *Standard* the name of Dr. Eder appears as supporting the discovery. Were it not that the statement in some degree has received an *imprimatur* by such a name being connected with it, one would at once have discarded it as one of those periodical outbursts of journalistic credulity which are so often rife at certain seasons of the year. There is one thing which is admitted, viz., that although red and orange have been secured, they fade in the light.

Now, as I pointed out in my address to section A of the British Association, photography in natural colours is a *fait accompli* of many years' standing, but the process is so long, and the results so evanescent in light, that there has been no practical use of the discovery so long ago made. Before we can hope to attain the goal which so many have tried to reach, at least two things have to be accomplished—the first, diminution in exposure of the sensitive surface, and the second, a means of preventing the print fading in white light, which is commonly called fixing the print.

That the first may be done I will not deny, but I think a glance into the physics of the matter will at once demonstrate that the second desideratum is chimerical, for the following reasons:—

There is no known element which is capable of taking on itself three colours, owing to molecular change, and this would be the least number of states in which it must exist to reproduce all the spectrum colours. We may, therefore, at once dismiss from the possibilities that a printed image in colours can be composed of elemental matter. This makes the possible image a compound which has to be acted upon by light. The action that must take place on such a compound must be either a reducing action or an oxidizing action (probably both), or else a molecular re-arrangement. In the case of chloride of silver, which, after a preliminary exposure to the light, can be impressed by the spectrum colours, I have found that the blue end of the spectrum is reproduced by reduction, and the red end by oxidation, there being a position where there is a combination of both. We can conceive matter to be so composed molecularly, that coloured light may sift out certain molecules, which shall in the aggregate reflect red light when the rays acting on them are red, or when green light acts on them, reflect the green rays, and so on. Let us fix our attention on the molecular aggregations which reflect red light. Since red light is reflected, it follows that all the rays existing in white light are absorbed except the red rays, and we know that when absorption takes place then internal work of some kind must be performed. In the spectrum, where these colours are produced on the sensitive surface, it must be recollected that no blue light acts on the part exposed to the red rays, and is, therefore, during that exposure incapable of doing any work in the molecules. Now, the very fact that the molecules are ready to arrange themselves into aggregations reflecting different colours, show that they are very susceptible of taking a new form of aggregation, and those which had aggregated into red reflecting masses by the action of the spectrum would be the first to re-arrange themselves into blue reflecting aggregations when acted upon by the blue rays which they absorb. The blue reflecting aggregations would also be the first to re-arrange themselves as red reflecting aggregations under the action of red light, and so on. Red, green, and blue reflecting aggregations—arrived at by exposure of the matter to the spectrum colours on subsequent exposure to white light, which is a combination of the three colours—must, therefore, rapidly change to a neutral tint, following out the above reasoning; and this is found to be the case in the photographs in natural colour taken up to the present time. We may take it, then, that no mere re-arrangement of molecular groupings by coloured light can remain stable in white light. Let us see if there is a probability of fixing the colour by chemical means. Fixing would mean removal of some matter still sensitive to light. As from the nature of things such matter is part of the molecular aggregation which causes the colour to be reflected, it is evident that the removal of a part of such aggregation must at once change the colour. If fixing be attempted by adding to the molecular aggregation, the same reasoning applies. We therefore are in this quandary as to a printing-out process in natural colours: If the colour be produced by change in composition of the matter acted on, it must be fixed by chemical agencies, which means destruction of colour. If it be formed by altered molecular arrangement, white light must of necessity alter its colour.

A process in natural colours which depends on development is out of the range of probability, as I have already stated in my British Association address. An embryo photographic image in natural colours might be possible, but to imagine that a coloured image can be built up by chemical means, such as by the deposition of silver on such image, is to endow the depositing atoms with a discriminative judgment, which, so far as is known, not one has the slightest symptom of possessing.

It will be seen from this that I am no believer in the discovery of a really practicable process for producing photographs in natural colours. We may wish every success to the gentleman who is making these researches, but the telegraphic description in the *Standard*, to my mind, does not require to be read between the lines to see that there is a great deal more of hoped for than of accomplished success in what has been done.

Crystal Palace Exhibition.—Mr. J. Dore writes that in the notice of the above, in our issue of the 4th inst., he was erroneously described as J. Dove as the winner of the bronze medal, Section 1 (professional), British subjects, in the lantern section of the Exhibition.

Croydon Camera Club. — Excursions will take place on April 19th and on Whit Monday; and on April 23rd there will be an exhibition of bromide enlargements. Information may be had from Mr L. De Clercq, 38, Lansdown Road; or Mr. Alfred Underhill, 23a, Clarendon Road, Croydon.

PHOTOGRAPHIC APPARATUS.

The following cuts represent pieces of photographic apparatus which Messrs. Marion and Co. have just introduced into the English market. Fig. 1 represents a new shutter by Voigtlander and Son, which is one of that class which opens and closes from the centre. Its peculiarity is that, after opening uniformly a small way, the aperture suddenly assumes somewhat a star-fish form, so in opening and closing allows more light to reach the plate than would be the case had it still an approximately circular form. This shutter works between the lenses. Messrs. Marion and Co. also have just introduced a stereoscope and stereoscopic camera combined. The ground glass screen is contained in a rectangular chamber, and when placed on the side nearest to the lenses, serves for focussing purposes, and the chamber keeps it sufficiently in shadow to render a focussing cloth unnecessary under ordinary circumstances. When placed on the farther side of the chamber it serves as a diffuser of light when the camera is used as a stereoscope. In whichever character the instrument is used, the same lenses are employed, but eye-cups are fitted into their hoods when the camera is employed for viewing stereoscopic pictures.

Fig. 2 is the camera invented by Mr. Samuels, and the cut shows one side of its lever arrangement for focussing; by the lever motion the lens is brought to focus expeditiously. The construction of this camera is extremely simple, and when it is closed it forms a cubical box, which looks as if it would bear a kick anywhere

Fig. 1.

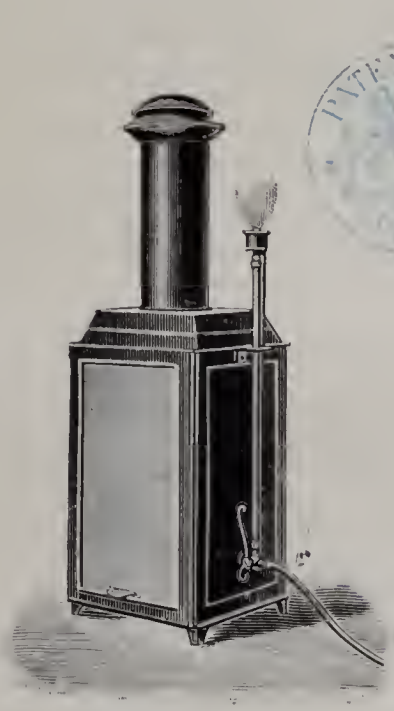


Fig. 4.

Fig. 3.

without injury to its contents. Fig. 3 might be called a "bipod" head-rest; the additional leg gives great firmness; the whole arrangement rests upon castors, which will roll in a forward, but not in a backward direction.

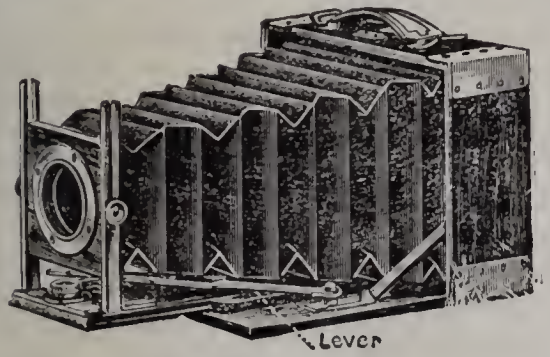


Fig. 2.

Fig. 4 is a developing-room lamp; when the tap is turned in one direction, the gas-flame rises inside the lamp, and there is no light in the room: when it is turned in the opposite direction the aforesaid flame is, practically speaking, extinguished, and the room becomes illuminated by the exterior gas jet.

Messrs. Marion and Co. have also exhibited to us a modified Kershaw shutter, with a "time" arrangement affixed thereto. The same firm is introducing a new reflector of light for studio use. It gives the power of universal adjustment, and consists of an upright iron rod fixed to a circular base: this rod is 4 feet 6 inches high, and on it run two junctions, each carrying a reflecting screen measuring 4 feet by 2 feet, the one covered with white calico, and the other with a brownish colour. These can be turned at any angle, thus allowing of reflection of light as desired. Another piece of apparatus Messrs. Marion and Co. have on view, is a portable stand for four or six or more pieces of flash light apparatus: the stand will pack away so compactly as to be easily transported to private houses for purposes of portraiture.

The California Camera Club.—Another photographic society is proposed for San Francisco, to be entitled the California Camera Club. The objects of the promoters are said to be the formation of a social, scientific, and art centre for photographers, and the establishment, in a convenient locality, of rooms for the use of the Club.

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

Halation—Magnesium Flash-Lamp—Developing Capsules—Sulphite of Soda—Use of Flexible Films in Egypt—Photographic Societies and Clubs in London—Negatives on Celluloid Pellicle—Lantern Projections.

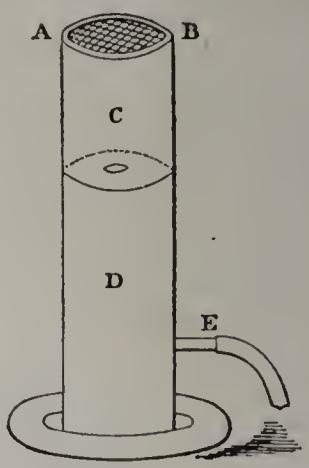
The French Photographic Society held its usual monthly sitting on the 11th inst.; the following were the principal questions discussed.

The Commandant Möessard has occupied himself with the question of halation; as for the causes of it, he has said nothing further than was told us by MM. Cornu and Lumière, but he has been seeking for a way to provide a remedy. He has not arrived at any practical solution, but he thinks suggestions ought to be made to the manufacturers of plates. In the first place, he remarked that if the sensitive film is very transparent, there is no diffusion of the luminous rays; they pass in a straight line, and consequently there are no reflections produced in the nature of halation. On the other hand, if the film is absolutely opaque, halation cannot exist. There is, then, a point of relative translucence or opacity at which halation is at its maximum. We must, says the Commandant, endeavour to arrest the transmission of reflected rays, or use thin pellicles.

It has been already shown, he says, that halation exists to a much less extent with pellicles. As for glass plates, the remedy proposed by M. Cornu appears to be good; but, further, could not the sensitive film be stained with some inert colouring material which would give sufficient opacity to arrest the light in the film itself? It would appear that in orthochromatic plates halation is much less pronounced. In short, these are simply suggestions of principles, and it is left to experimenters to try them, and choose that which succeeds the best.

M. Vidal pointed out an objection to staining the film, as if the film is so coloured as to retain the whole of the rays of light, it would be insensitive. He thought that the use of a coloured screen which should greatly diminish the power of the blues, the violets, and the high-lights, would contribute to diminish halation. In his opinion, the introduction of anything into the sensitive compound except substances capable of bestowing orthochromatic properties upon it, should be avoided. In this connection, he mentioned that, if a little too much of the colouring matter intended to orthochromatise the sensitive product is added, a general insensitiveness occurs, which must be avoided. Good orthochromatic plates, whilst containing a sufficient amount of the colouring principle, are, or ought to be, almost colourless. In his humble opinion, the best thing was to follow the path indicated by M. Cornu, and to seek for an easy means both of covering the back of the plates with a medium possessing the same refractive index as glass, and to be able, without trouble, to remove this coating from the plate at the moment of development. As pellicle suppresses halation almost completely, we have again this resource, and it is a question of great interest to be able to produce images free from this annoyance, this defect.

A new magnesium flash-lamp was shown in the name of M. Vergeot by the Commandant Fribourg. It consists simply of a metallic tube of the height of about ten centimetres, and of the diameter of an ordinary candle. It may be placed in a candlestick or chandelier. It consists of two distinct parts, C a spirit lamp, D a reservoir of pure magnesium powder. At E is seen a tube to which to attach the flexible pipe from a pneumatic ball. At the top of the lamp AB is a wire grating, and below at C is cotton impregnated with spirit. The combustion lasts about a quarter of an hour. The reservoir D being filled with magnesium and the spirit lighted, if a pressure is given to the ball the powder is blown through C; it is inflamed and the flash projected. In this manner a series of very luminous flashes may be produced successively and without danger. This lamp is one of the simplest and the best which I have seen.



A chemist of Niort, M. Michelin, has devised capsules containing each a dose of developer, which are easy of carriage, and which at the desired moment permit a developing solution to be rapidly made up. These capsules contain, the small one pyrogallic acid, and the large one the desired mixture of alkaline salts, carbonate and sulphite of soda. The contents of these two capsules are placed in from forty to fifty centilitres of water. M. Michelin proposes to prepare other portable capsules for different developers—hydrokinone, pyrocatechin, eikonogen, and others. We have already in this direction had the developing pastilles of Ener.

Another chemist—M. Chicandard, of Lyons—has communicated the results of his interesting study of sulphite of soda. This product, he tells us, is very rarely pure; it most frequently contains sulphate of soda in larger or smaller quantities, and free carbonate of soda. To assure oneself whether there is any sulphate of soda, it suffices to produce with excess of chloride of barium a precipitate in a solution of sulphite of soda. If this precipitate is not entirely dissolved by hydrochloric acid the sulphite is impure. To demonstrate the presence of free carbonate, we have recourse to phenol-phthalein. A drop of an alcoholic solution of this product becomes red if the sulphite contains free alkali; if on contact with the sulphite no colouration takes place, it shows that no free carbonate is present.

To ascertain the quantity of sulphate which impoverishes the sulphite, M. Chicandard advises the employment of the following process. In the first place, a solution of 2·45 grammes of the sulphite to be tested is made in 100 grammes of distilled water; secondly, a mixture of

Iodine (in crystals)	... ...	2·53 grammes
Iodide of potassium	... ...	3·60 ,,
Distilled water ...	... ...	100 ,,

Ten c.c. of the first solution are taken, and drop by drop the second is added from a burette graduated in tenths of a cubic centimetre until the liquid takes a permanent yellow colouration. A few drops of thin starch paste may be added, and in this case it is an intense blue colouration which indicates the end of the reaction. The number of tenths of cubic centimetres of the iodine solution employed indicates the percentage of sulphate contained.

M. Chicandard recommends keeping bottles of sulphite

and of pyrogallic acid in the light, contrary to the prejudice which insists that light is injurious to pyrogallic acid.

M. Balagny showed a series of negatives, 21 by 27 centimetres, on flexible films, obtained in Egypt during a scientific mission. They number 120, and are very remarkable. They have undergone for more than three months a temperature of about 40° Centigrade. He considers this as a new proof of the resistance of these pellicles to very high temperature, and he adds that, thanks to this light and unbreakable support, the tourist is always sure of obtaining negatives, and is exempt from the considerable expense of carriage occasioned by the use of glass plates.

Mr. Stebbing, on returning from a journey to London, greatly interested the Society by a description of the photographic clubs and societies in London; he also mentioned numerous hotels in which amateur photographers will find a dark-room for their travelling work.

M. David claims to have been among the first to recommend celluloid pellicles for photographic negatives; he showed some thus obtained by him from 1883 downwards.

Some interesting slides were shown in the lantern, amongst them reductions from the negatives on flexible films shown by M. Balagny, and some experiments in coloured work by M. Maurice Buguet. The latter, although as yet incomplete, promise good results with perseverance. A lantern slide gains much by being coloured, provided that this supplementary work is done with art and sobriety.

A French Exhibition in London is in course of preparation for the month of May. There is room for doubt whether photography will be largely represented in it. A committee is occupied in organizing this special class.

THE LATENT PHOTOGRAPHIC IMAGE.*

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

A second hypothesis, also physical in its character, was propounded by Mr H. S. Starnes,† and was based mainly on the facts that an unexposed gelatino-bromide plate is not affected by solutions which will reduce ordinary precipitated silver bromide, and that if a quantity of emulsion which has been exposed to light is melted up with a fresh quantity of emulsion or gelatine, or is simply re-melted without any addition, the resulting emulsion shows only a trace of fog on development. It was suggested that each particle of silver bromide is enclosed in a protective envelope of gelatine, and that the impact of light waves ruptures this envelope and exposes the contained silver bromide to the action of the developer. The destruction of the latent image by potassium bichromate was supposed to be due to the hardening effect of the bichromate on the gelatine. It is not easy to see, however, how bichromate could heal up, so to speak, the ruptured envelopes; nor why the image should be destroyed by bromine, which tends to destroy or alter the gelatine; nor why silver bromide in gelatine should be more sensitive than silver bromide in collodion, the latter being by far the more porous medium of the two.

All the evidence indicates that the formation of the latent image is a photo-chemical operation, the composition of the material forming the image being different from that of silver bromide. The difference between the formation of a visible image and a latent image is, in fact, as our President, Capt. Abney, has always insisted, a difference in degree and not in kind.

It is well known that bromine, chlorine, and any substance which will readily give up bromine or chlorine, will destroy the latent image, the result being independent of the mode of manufacture of the emulsion. (Examples shown.)

Potassium dichromate in neutral or acid solution has the same effect. I observed that a mixture of the dichromate and potassium bromide produced this result more rapidly than the dichromate alone, and, therefore, it seemed not improbable that the effect is not simply an oxidising action of the dichromate, but is due to a simultaneous action of the dichromate and the small quantities of soluble bromide which are almost invariably present in gelatine plates.* This point does not seem to have been investigated before.

It is practically impossible to wash out the last traces of the bromide, and hence the only course open is to convert all the soluble bromide into silver bromide, and this was done by immersing the plates for an hour in a 2 per cent. solution of silver nitrate, slightly acidified with nitric acid. They were then washed, first with distilled water containing a little nitric acid, perfectly free from chlorides, &c., and finally with water alone. I think it may be taken that they contained no soluble haloid salt.

Potassium dichromate solution (5 per cent.) was purified from haloids by adding a small quantity of silver nitrate solution and filtering through glass wool previously well washed.

The plates were exposed to light, and one half was immersed for five minutes in the dichromate solution, very thoroughly washed, and developed with ferrous oxalate containing no bromide. Although there could not have been any simultaneous action of the dichromate and a soluble haloid, the latent image was destroyed (example shown); and therefore we may take it, I think, as established that the destruction of the latent image is due solely to the action of the dichromate, which probably exerts an oxidising action, but may also be effective because it converts the material of the latent image into silver chromate.

Nitric acid is also commonly said to destroy the image, but I found that the strongest acid that the gelatine would stand after previous treatment with chrome alum certainly did not destroy it. (Examples shown.) A washed collodion emulsion made with excess of silver nitrate and washed with distilled water in order to avoid introduction of soluble haloids, was exposed to light and then treated for twenty minutes with nitric acid containing 25 per cent. of real acid. After washing and development it was evident that the latent image had not been destroyed. (Example shown.) Other similar experiments gave similar results, but in all cases the action of the acid on the gelatine or pyroxiline made it impossible to obtain density. I am making further experiments, but the results so far obtained seem to indicate that the nitric acid does not destroy the latent image, although it may prevent its development. In this connection we may recall the fact that even the strongest nitric acid does not prevent the darkening of silver chloride or bromide when exposed to light.

It seems to me that it has not been clearly recognised that the formation of a developed photographic image

* Continued from page 283. † *Brit. J. Phot.*, 1883, p. 643, 656, &c.

* See for example, Zettnow. *Phot. Correspondenz*, 1889, p. 56 *et seq.*

takes place in three distinct stages, which may and probably do differ considerably in the nature of the changes which occur. First we have the *latent photo-image* formed solely by the action of light, and therefore of photo-chemical origin; secondly, we have what I propose to call the *primary* or *fundamental image* formed from the latent image by the action of the developer, and therefore partly of photo-chemical and partly of chemical original; and thirdly, the *developed image* formed by the action of the developer from the primary image and the unaltered silver bromide in the film. This last process is probably mainly electro-chemical.

Potassium iodide is also said to destroy the latent image, but I find that after immersion in a 5 or 10 per cent. solution of the iodide for a time sufficient to convert all the silver salts in the film into silver iodide, there is still left an image which can be seen during development, and can still be seen after fixing, although it is then very faint. (Examples shown.) The same result is obtained with pure bromide or brom-iodide emulsion. It might be argued that the action of the iodide had not been continued sufficiently long. Twenty minutes' immersion in a 10 per cent. solution of the iodide was the maximum given, but the conversion of the silver bromide into silver iodide was certainly complete, and it may be assumed that any action on the latent image had reached its limit. It seems, then, that potassium iodide does not destroy the latent image, nor prevent its conversion into a primary image by the developer, but does prevent the formation of a developed image, doubtless because the silver salts in the film are converted into silver iodide.

Hydrobromic acid and hydrochloric acid are also said to destroy the latent image. The action of the first acid I am investigating. Hydrochloric acid containing 12 per cent. of real acid does not destroy the image on a gelatino-chloride plate after twenty minutes' immersion. (Example shown.)

(To be continued.)

LIMITATIONS IN THE TREATMENT OF SUBJECTS BY FOCUS.*

BY T. R. DALLMEYER.

That the combined chemical and mechanical process known as "Photography" be admissible in the sciences must be determined by its exactness. So far as a photographic lens can be made perfect (speaking technically, this means that the instrument be aplanatic), the applications to science are eminently satisfactory in records and investigations, in that but one plane of the object has to be represented by one plane in the image, or that the conjugate points in the object are so situated that they are simultaneously received to an accurate focus on the plane of the photographic plate. These conditions are practically maintained in stellar photography, micro-photography, &c. Photography in many such applications is not only sufficiently truthful, but records on the sensitive plate more than the most practised eye can ever see, for physiological reasons. Immediately photography is employed to depict objects in different planes, where the corresponding points in the image are formed on sensibly different planes, the representation by receiving them on one plane is no longer truthful nor exact. A photographic instrument to accomplish this theoretically is simple enough, but nevertheless is a practical impossibility. It would only necessitate the employment of an imaginary "pinhole," the aperture of which shall be the section of a mathematical straight line. In such a case, every plane in the object would be equally and perfectly rendered, mathematically true and exact in position on the plane upon which the image was received, the size of the image itself being dependent on the distance of this plane (of the plate) receiving the image from the imaginary "pinhole."

From the fact that in pictorial photography it is necessary to depict different planes at once, it follows that, strictly speaking, the results are untrue in drawing, although relatively they can be made in so-called sharp photographs far truer than any artist could ever expect or would attempt to render them in detailed drawing. Such approximate precision capable of being produced by a photographic instrument might be the envy of the mere still-life painter, and is certainly acknowledged by all painter artists as a useful elementary means to an end.

I understand the attitude of a painter artist in depicting a scene to be that of a workman with an artistically educated sight (with binocular vision), anxious to portray or reproduce the individual feelings and emotions produced in *his* mind by the scene before him, and with working tools at his command that he relies upon to help him in giving a truthful impression of what he sees. This individuality is not capable of any exact definition, although he may succeed in impressing others with the very same feelings that his transcript was intended to convey. Impressed by this individuality he will emphasise or subdue, according partly to his own taste, and partly according to the principles of composition (the latter being mostly negative principles), which are the result of long study and practice.

With the photographer the attitude is very different. Grant that he is perfect in his technique; the tools at his disposal are self-acting, recording the image from one point of sight only, and the individuality of the instrument is limited and capable of exact definition, but here his own individuality is restrained by the latter's artistic capabilities. The question of the production of effects is *now* one dependent entirely on scientific laws, and is defined by the optical construction of the lens itself and the law of conjugate foci.

As the camera can only depict what is placed in front of it, the photographer, to produce work that can be called artistic, has, or must cultivate, that artistic appreciation of nature in all her moods which the true artist observer and admirer of her finds so much pleasure in. The choice of the subject, its charm or interest, and its more or less good composition as seen from different points of view, will indicate the operator's greater or less artistic appreciation and individuality; but having only an inanimate and unthinking machine, he is bound to look for such phases of nature as can give that machine the greatest opportunity of utilising its limited powers. The limited treatment in point of definition lies in the adjustment of "focus"; the controversies that have arisen on this point, on the art side, have certainly done much to raise photography from a copying process to that of a fine art.

You have before you a series of photographs that show the *tendencies* by various treatments of the focus towards the destruction of the best possible image as given by a perfectly corrected lens. They are the result of a series of accurately performed experiments, and as a record may

* Abstract of a paper read before the Camera Club Conference, and published in the *Journal* of the Club.

prove of value and impress the memory with the *tendencies*, without resort to the theoretical study of the principles that guarantee the results.

It is probable that you are all well aware that the test for a perfectly aplanatic lens is that when a point of light is focussed for the image it is seen sharp, and that on wheeling the plane of the best focus in or out the image vanishes equally on either side; if positive spherical aberration is present on the inside of the focus, the image vanishes or loses structure very rapidly, but on the outside lingers for a considerable distance, and its structure is maintained; this becomes more and more remarkable the more positive spherical aberration is present. The converse of this occurs when negative spherical aberration is present.

The reason—and it is easily shown mathematically—is, that in the former case there is an outward concentration of the image-forming rays inside the focus, and an inward concentration of the image-forming rays outside the best focus; and the converse of this occurs in the latter case. Again, it must be borne in mind that the least circle of aberration in a non-aplanatic lens is *not* the best focus visually, but at the plane where there is the strongest inward concentration of the image-forming rays. I have intentionally laid some stress on this point now, as objection has been taken to the fact that spherical aberration improves the out-of-focus planes, simply from ignoring the fact that the important element, viz., the measurement of the longitudinal aberration, has been lost sight of in comparisons made of the transversal measurements of the circles of confusion as compared to those of an aplanatic lens.

With regard to the illustration, you will note various regular steps in the alteration of the plane receiving the image; if the focus be shortened, or a movement *in* be made, you know it corresponds to a more distant object, and hence the plates in which there has been an inward movement correspond to *foreground* tendencies when some more distant object is focussed for; and, on the other hand, if the focus be lengthened, or a movement *out* be made, the focus is made for some nearer object, and hence the plates correspond in these cases to background.

It would be an easy matter with any lens to construct a table showing the limits of movement of the camera back permissible, not to exceed a certain definite out-of-focus circle (deemed consistent with sufficient maintenance of structure), for planes on either side of the one chosen that should include such treatment for the extreme distance and nearest foreground required. If these were exceeded by a given lens with full aperture, the requisite limit could be arrived at by reducing the aperture exactly in the proportion you wish to reduce the out-of-focus circle produced to that required.

(*To be continued*).

Correspondence.

THE CRYSTAL PALACE EXHIBITION AWARDS.

Sir,—I am requested by the Manager, on behalf of the Company, the Committee of Judges, and the Executive, to deny unequivocally the allegations contained in a letter signed by Mr Edgar G. Lee and others, and published in your last issue, respecting the award of the National Photo. Club Challenge Cup, and to add that the company is in a position to prove that such allegations have absolutely no foundation in fact.

I am further desired to thank you for your editorial note at foot of letter, which is as courteous as it is strictly true.

S. G. Buchanan Wollaston.

Crystal Palace Company, Crystal Palace, S.E., April 14th, 1890.

Patent Intelligence.

Applications for Letters Patent.

5,046. W. B. Luce, 321, High Holborn, London, "Camera."—April 1st.

5,075. G. Clulow and A. H. Sale, 55, Chancery Lane, London, "Changing Boxes."—April 1st.

5,158. C. H. Stanbury, 24, Southampton Buildings, London, "Apparatus for Holding Photographic Plates."—April 2nd.

5,193. G. Dickinson, 144, Morley Avenue, Noel Park, London, "Cameras."—April 3rd.

5,215. F. Beauchamp, 115, Cannon Street, London, "Instantaneous Shutters."—April 3rd.

5,227. C. Whitney, 323, High Holborn, London. "Cameras."—April 3rd.

5,436. J. Dewe, Hotel Métropole, London, "Exhibition of Photographs."—April 10th.

5,439. D. Whyte, 87, St. Vincent Street, Glasgow, "Vignetting Appliances."—April 10th.

5,458. H. R. Hume and E. W. Parfitt, 19, Southampton Buildings, Chancery Lane, London, "Detective Cameras."—April 10th.

Specifications Published.

7,659. *7th May*, 1889. "The Preparation of Crude Glass.' Julius Quaglio, 25, Louisenstrasse, Berlin, N.W. Germany, Engineer.

In the glass industry, the glass used for treatment proceeds from compounds which are melted in the pots or hearths of furnaces, serving likewise for working the same throughout. Separate experiments have been undertaken by various experimenters with a view to carry out the melting process in peculiar furnaces, and to feed the melted mass in a liquid or cooled state to the working furnaces while endeavouring to free the mode of proceeding hitherto resorted to from a number of the defects attending the same.

A series of practical experiments has led to a new process for the manufacture from a vitreous mass of a middle or intermediate compound: to this intermediate compound the inventor has given the name of calcin (crude glass), which calcin can be fed to the working furnace without any admixture of alkalies, and in a cold state, in order to be heated therein, and used for the manufacture of the glass wares of commerce. By these means, he says, an extraordinary yielding manufacturing mass can be continuously supplied as well in pot furnaces as in furnaces provided with tanks or cisterns (hearths). Owing to the use of calcin, the rapid destruction of the material constituting the furnaces, whether furnished with pots or cisterns, which is brought about by the decomposing action of the alkalies when the mass is directly melted, is, he says, prevented, and a better product free from threads or streaks, striae, or wreaths is thus obtained.

8,054. *May 14th*, 1889.—"Photographic Cameras." John Henry Skinner and Edwin Jackson Lyth, trading as J. H. Skinner and Co., East Dereham, Norfolk, Photographic Apparatus Manufacturers.

The object of this invention is to provide photographic cameras with means whereby they can be quickly extended or closed as desired.

The extension apparatus of photographic cameras at present in use consists of a pinion gearing into a rack, the said pinion being actuated by a milled headed screw.

According to this invention we dispense with the pinion, and provide a cog wheel of suitable size gearing into the rack on the frame. This cog wheel is provided with a handle or turn for actuating the same.

Photographic Club.—The subject for discussion on April 23rd will be "Development of Instantaneous Exposures;" on the 30th, "Development of Unknown Exposures."

The *Journal of the Society of Arts* announces that the lectures on "Colour and Colouring," the last of which was given by Professor A. H. Church, M.A., F.R.S., on March 31st, will be printed in the *Journal* during the summer recess. On April 30, Mr. T. R. Dallmeyer is to read a paper on "Photographic Lenses," at the Society of Arts.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the ordinary meeting of this Society held on the 15th inst., the chair was taken by Mr. J. GLAISHER, F.R.S., President.

A paper on "A Standard Method of Development" was read by Mr. C. H. Bothamley, F.C.S., and illustrated by a table showing the sensitometer numbers procurable by various developers and times of development. In the course of his observations, Mr. Bothamley said that it would not be proposed to fix one uniform system of development for all subjects. Generally speaking, the nature of the subject and the intention of the photographer as well as other circumstances must be taken into account. If all subjects were to be developed in the same way photography would be lowered from the position of a fine art to that of a merely mechanical one. There was, however, an advantage in adopting some definite standard for the purpose of comparing results in a scientific way. In considering what it was desirable to compare, they might take either the least amount of exposure that would suffice to bring out a visible image, or they might take the amount of gradation obtainable. For the latter purpose he thought no standard developer could be found, as a different constitution of it would be required for different makes of plates, and to suit the tastes of different photographers. The same developer would not suit the photographer who delighted in softness and the one who desired chiefly to get what was called pluck. We might then look upon the problem as narrowed to the question of obtaining detail, but such detail must be got without fogging. What was wanted was to utilise to the utmost the selective power of the developer in reducing silver where light had acted on the film, and in not causing reduction independent of the action of light. One of the things to be considered was that photographers were dependent upon dealers for the purity of the chemicals they employed. Several conditions were required to be fulfilled in a standard developing solution. It should be simple in composition, and, if possible, should be like what was in general use. Then only such chemicals should be required as can be obtained in a fairly pure state. Of the various developers available, ferrous oxalate was noticeable as failing to fulfil several of the conditions that had been laid down. Although potassium oxalate could be obtained tolerably pure, this was not always the case with ferrous sulphate, and even when pure to start with, it rapidly changed. The developing solution, too, soon oxidised, and ferric oxalate, the product of oxidation, was not only a retarder, but actually a reducing agent. Finally, it was now but little in use for developing negatives, although for positive work it was still largely employed. He did not think that at present eikonogen could be relied upon for purity, and, therefore, we were reduced to select either pyrogallic or quinol. Of these, the first-named is to be preferred. It is the developer most largely used ; in the dry state it keeps well, and its great solubility makes the preparation of solutions very easy. With pyro, however, we must not use caustic soda, or caustic potash, but must select either liquid ammonia or an alkaline carbonate. With liquid ammonia a restrainer is generally used, and this may take the form of bromide either of ammonium or potassium, or of a salt containing an organic acid. Bromide of ammonium, on the whole, he had found to be the best restrainer. With potassium bromide there was commonly present some bromate, and not unfrequently a little caustic potash. Carbonate of potash is not so readily obtained pure as carbonate of sodium, and is, moreover, objectionable from its hygroscopic character. Carbonate of sodium exists in various forms as regards the amount of water and consequent value of the salt and proportion of it required to produce a given effect. The anhydrous variety is that most likely to be pure and definite, and may be prepared by heating the ordinary carbonate. When obtained it should be kept in a glass bottle fitted with an india-rubber stopper ; a glass stopper is very bad both for keeping air out, and, in the case of volatile substances—like ammonia—for confining the vapour. When ammonia is used for the standard developer its strength should be determined by titration. There is no large amount of apparatus and no great deal of skill required for this process. A standard acid is required, and oxalic acid is found to fulfil the necessary conditions. A little of a solution of aurine, one in 500 of diluted alcohol, should be used with it as an indicator of the neutral point. 37·06 grammes of oxalic acid is dissolved in a litre of distilled water, and 1 c.c. of this solution is sufficient to neutralise a centigramme of real ammonia, NH_3. The pyro for a standard developer should be dissolved in distilled water just before required. No acid should be added. It is not admissible to use sulphites in standard solutions. Not only is it rare to obtain sulphites pure—samples professing to be sulphite have, indeed, been found to contain no sulphurous acid at all—but the action of sulphite upon development is not determined. An approximation only to purity can be obtained when using the neutral or anhydrous sulphites. The standard developer will consist, then, of pyro, with liquid ammonia, and bromide of ammonium, or of pyro with carbonate of sodium. The preparation that he had used as a standard for a long time was composed of—

Pyro	2 grains
Ammonium bromide	1 grain
Liquid ammonia	3 grains

As this proportion of liquid ammonia contains about one-third of its weight of real ammonia, NH_3, the formula may be put into parts of 1,000, thus—

Water	1,000
Pyrogallol	5
Ammonia bromide	2·5
Real ammonia	2·5

It occurred to the reader of the paper to try various forms of developers to see whether anything better could be got at as a standard. To try them he had used a sensitometer exposed to the light coming through an opening one centimeter square, placed close in front of the brightest part of the flame of a Sugg's Argand burner. He had found that all the detail that was obtainable would come up in five minutes, but that the action might be continued up to an hour without much fogging, and with considerable accession of density. The proportion of bromide might be doubled without keeping back detail, and with improved clearness during long development. With carbonate of sodium as the alkali, development was lengthened ; it required ten minutes to get out the detail, and if the plate was left for an hour in the solution, it was much degraded by a general deposit or chemical fog. Whenever development was continued for a period of more than ten minutes, he advised that it should take place with the air excluded as far as possible, and this he accomplished by using an upright vessel and covering it with a fitted top of india-rubber. The temperature at which the experiments had been carried on was 60° Fahrenheit.

Captain ABNEY said that the method of reckoning sensitometer numbers by the last one that was just discernible was very misleading ; it was far better to measure the density of deposit of some of the numbers.

Mr. W. E. DEBENHAM thought that although the question of temperature had been touched upon, the difference of result due to differences in that respect were not sufficiently appreciated. In cold weather a much longer time was occupied with developer of a given strength, and in hot weather the amount of alkali or time of development might again be considerably reduced. He had known even experienced photographers to be misled by this effect at the first coming of cold in winter.

Mr. JOHN SPILLER welcomed a paper in which scientific bases were established for experiment. As for what Mr. Debenham had said about the effect of temperature, he could quite corroborate that. During the cold weather a few weeks since, he was quite surprised to find the immense difference that variations of temperature caused in the action of the developer.

Mr T. SEBASTIAN DAVIS congratulated the reader of the paper upon its scientific character. He was pleased to find the system adopted of measuring by 1,000 parts, which he thought

better either than the proportions by ounces or grammes, or than the per centage method.

The Chairman referred to his own experience some years since, when more actively engaged in photography, and said that he had noted the remarkable difference of behaviour of the developer due to variations of temperature.

Mr. Friese Green exhibited the camera already described in these pages, fitted with mechanism for producing a series of photographs of moving objects taken in rapid succession. By turning a handle, successive portions of a roll of sensitive film were placed in position behind the lens, and exposed. It was stated that the camera could be worked at the rate of 600 photographs per minute, or even faster.

Messrs. E. G. Amplett and W. Symon were elected members of the Society.

Camera Club.

On Thursday, April 10th, there was an exhibition of lantern slides, eight or nine members contributing towards the show. Mr. Gambier Bolton exhibited a new set of animal slides; Mr. Elder some Dutch scenery; Mr. Ferrero, landscape work; and Messrs. Grimshaw, Howson, Robertson, and Noel-Cox, pictures of various kinds. An interesting set of Arctic subjects lent by Messrs. Fry was also shown and described, and a variety of slides by the Woodbury process.

During the evening, proofs of his recent pictures, "The Haysel" and "Breezy Marshland," presented by Dr. Emerson to the Club, were exhibited.

On Thursday, April 24th, there will be a discussion upon Mr. Dallmeyer's paper read at the Conference; the subject was "The Treatment of Subjects by Focus."

Hackney Photographic Society.

On Thursday last the ordinary meeting was held at Morley Hall; Mr. A. Dean presided.

After confirmation of the minutes, the Secretary drew the members' attention to the annual soiree to be held on the 24th, and announced that the Society's orchestra would play on that occasion. Messrs. Cocks and Beurle were elected members, and Mr E. H. Jones was nominated.

The Secretary handed round the Eclipse lantern carrier, which Mr. Pringle had so highly spoken of.

Mr. Gosling wanted to know what were the disadvantages of a shutter going from side to side.

Mr. Spratt thought it would probably cause vibration, and he showed Crouch's detective camera, the spring of which was taken from a clock. There was, however, no vibration in this.

Mr. J. Carpenter then read his paper on "Lantern Slide Making," and finally concluded by a demonstration. He generally masked the margin of the plate, so that if there was any fog it would show. His favourite lantern plate formula was the following:— Eikonogen, ¼oz.; sulphite soda, ½oz.; bromide potassium, 3 grains; carbonate of potash, ¼oz.; making the whole up to 10 ounces of boiling water. For use he diluted 1 part with 2 to 4 of water, fixing in two baths. Mr. Carpenter secured a medal at the recent exhibition for this work.

London and Provincial Photographic Association.

At the meeting on the 10th inst., Mr. A. L. Henderson occupied the chair.

Mr. F. York exhibited a cover glass from a lantern slide very much clouded, and read a letter he had received in reference to some from Mr. Pancoast, of Waterbury, Conn. At a recent meeting of the Photographic Society of Philadelphia, the subject of erosion on lantern slide cover glasses was discussed at some length, and reported in the *American Journal of Photography*, a copy of which Mr. York passed round.

Mr. A. Edwards showed prints from negatives of the Oxford and Cambridge boat race taken on isochromatic plates.

Mr. J. B. B. Wellington used this kind of plate on the same occasion, and found them very quick.

A question was asked how to varnish celluloid film negatives.

The Chairman advised rubbing them over with bees-wax dissolved in turpentine.

The Hon. Secretary recommended gold size and turps, and the films hung up by one corner to dry.

Mr. F. P. Cembrano exhibited a lantern slide of a "pellicule," showing sixteen pages of printed matter. During the siege of Paris, attached to a pigeon's wing so as not to interfere with its flight, these "pellicules" were used for the transit of information from one place to another.

Mr. Davenport showed a lantern carrier, fitted in a perpendicular position to the lantern; the slides are pushed upwards, the same action covering the lens during the changing of the slides.

Mr. Edwards exhibited a lantern carrier he had constructed. It consisted of a frame for holding two slides, which were set at an obtuse angle. The frame worked backwards and forwards on a pivot fixed to the front of the lantern.

A collection of members' slides was then projected on the screen, the work of Messrs. H. M. Hastings, A. C. Pemberton, J. Atkinson, R. P. Drage, P. Everitt, Teape, Edwards, T. E. Freshwater, and F. P. Cembrano.

Leicester and Leicestershire Photographic Society.

The monthly meeting was held on April 15th, when two propositions were received for ballot at next meeting.

The prints sent in for competition were placed on view, and were considered the best the members have yet sent in. The members who sent prints were Messrs. Bankart, Pierpoint, Woodland, Leeder, Wilson, Joliffe, Porritt, Partridge, Cook, and Squire.

A number of photo-litho prints, sent by the Graphotone Company, Enfield, was placed at the disposal of the members.

Newcastle-on-Tyne and Northern Counties Photographic Association.

An exhibition of photographs, apparatus, and photo-mechanical reproductive processes will be opened in the Central Exchange Art Gallery in Newcastle. The Mayor of Newcastle will open the Exhibition on Friday evening, after which a lecture, entitled "A Tour in Norway," illustrated by means of the oxyhydrogen lantern from slides taken by the lecturer, will be given by Mr. Paul Lange, the President of the Liverpool Amateur Photographic Association. Over 1,200 pictures will be on exhibition, apart from the section devoted to apparatus. The number of exhibitors exceeds 100. To add to the attractive character of the Exhibition, special vocal and instrumental concerts will be held each Saturday, and on the other evenings illustrated lectures by Messrs. W. Lang, of Glasgow, W. D. Welford, of Birmingham, J. P. Gibson, of Hexham, and other persons, besides interesting evenings with the oxyhydrogen lantern.

Dundee and East of Scotland Photographic Association.

April 8th.—General meeting; Mr. J. D. Cox in the chair.

Excursions were arranged to take place on May 21st, The Trossachs; June 28th, Lochearnhead; and the date of a third was left open.

The President (Dr. J. K. Tulloch) read a paper entitled, "Selecting a Lens" (see page 295).

Specimens of "Kallitype," a new printing process, were on exhibition, and a demonstration of the process was promised to be given at the May meeting.

Croydon Camera Club.

A meeting was held at the head-quarters, Public Hall, on April 11th, The President (Mr. H. Maclean, F.G.S.) in the chair.

The subject for the evening was a demonstration of "Platinotype Printing" by the Platinotype Company's representative, Mr. Smith, who gave the history of the platinotype process of photographic printing, describing the action of the various chemical substances used. He then developed a number of prints which had been taken from members' negatives by the Platinotype Company, these being distributed among the members. An interesting discussion followed.

Four new members were elected during the evening.

PHOTOGRAPHIC SOCIETY OF IRELAND.

An ordinary meeting was held in the Rooms, 15, Dawson Street, Dublin, on Friday the 11th inst., Mr. GEORGE MANSFIELD, J.P., in the chair. After two new members had been elected,

Prof. STEWART gave a lecture on "The Stop and the Optical Centre," and illustrated his remarks by numerous diagrams drawn upon the blackboard. In the course of his lecture he said the optical centre of a lens had important properties, and these properties, and how to find the position of the optical centre, should be understood by every photographer. In many cases the optical centre was outside the lens, and this was an important item to remember. In referring to spherical aberration, he said that all attempts to grind lenses so as to get rid of spherical aberration had been failures, but the use of a stop not only got rid of spherical aberration, but it also cured the curvature of the field of view. The stop also produced what was known as "depth of focus." Depth of focus was not so much a property of the lens as a property of the stop; by using a small stop depth of focus was obtained. Get the nearest object in a picture well focussed, put in a small stop, and everything else must be in focus. Another advantage of the stop was that it produced an approximately uniform illumination all over the plate. An ordinary lens was such that if it were used without a stop it would give unequal illumination over the different parts of the plate.

A discussion ensued in which the following members took part, namely: the President, Messrs. L. Meldon, J. H. Hargrave, J. H. Woodworth, and J. V. Robinson. A vote of thanks was passed to Prof. Stuart for his interesting and practical paper, after which Dr. J. Alfred Scott described what he termed an instantaneous work formula, and explained how it was possible for a photographer, by making a calculation, taking the different factors governing instantaneous work into account, to ascertain beforehand whether it would be possible to get satisfactory results on any given day.

The meeting then became conversational, and praise of the Society's new dark room was freely expressed.

WEST LONDON PHOTOGRAPHIC SOCIETY.

A TECHNICAL meeting of this Society was held at the Addison Hall on the 17th inst.; the President, Mr. CHARLES BILTON, occupied the chair for the first time since his recovery from serious illness. There was a goodly attendance of members, some of whom had brought with them various objects of interest.

Mr. SELBY showed Rouch's detective, which led to a discussion upon hand-cameras in general. One member, who worked with a Rouch, had found the lever would not always raise the plate; this defect, however, he had managed to set right. Other speakers testified to the capabilities of the camera.

Mr. WINTER kindly offered to allow members to test his Giah camera. He considered that all instruments should be practically tested before being issued to the public.

A discussion took place as to the comparative effect of printing in platinum in the sun and in the shade, in which several members took part.

Mr. WHITING showed a home-made view-finder, and advocated the more general use of that instrument. Whenever he went for a walk he put it in his pocket, so that if he came across a pretty bit he looked through the finder and ascertained how it would look as a picture, and if he thought it worth taking, he visited the spot subsequently with a camera.

Dr. F. H. LOW passed round some blue prints, some of which had been toned by a process described in a recent almanack, and the SECRETARY showed aristotype prints from negatives taken by flash-light of wine vaults in the Minories.

Mr. RICKFORD exhibited negatives, some of which had been intensified, and showed a number of prints from the same by a variety of processes, illustratiug the comparative results which might be obtained.

The PRESIDENT then announced that the Secretary would read a paper upon "Lenses" on the 25th April, and that the Annual Smoking Concert would be held at the Richmond Hotel on May 9th.

Answers to Correspondents.

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

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

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

A. W. (Brighton).—*Axel Lagrelius's Phototype Process.* For fuller particulars you should write to Herr Albin Roosval, Editor of the *Fotografisk Tidskrift*, Stockholm, who might also be able to furnish specimens, by small payment, in addition to the one issued with the Journal.

A. M. M.—*Specification of Copying Apparatus* has been sent on to you. We are always willing to undertake this small service, the Patent Office being so near our head-quarters.

J. H. AINLEY.—*Zinc Photo-Block and Prints.* We are sending you a small block which has done duty in the NEWS; from this you will see that yours is not etched deeply enough, but we think you have scarcely done justice to your own work, as the prints forwarded will show.

MRS. CHERRY.—*Old Plates Illustrating Styles of Engraving.* After consulting several old works in the Patent Office Library, "The History and Art of Engraving," date 1747, Senefelder, the Vicomte Henri Delaborde, Thomas Hodgson, 1820, and others, we found nothing answering the description of the two plates referred to in your letter. They may be valuable, and we will take an early opportunity of making further search in the Art Library, South Kensington.

ARGENT.—*The Eikonogen Patent* covers both the alpha and beta naphthol compounds. See top of page 3 of the Specification, where it is stated that the alpha naphthol developers require more "sulphide," misprint for *sulphite* of soda, to keep them in solution.

R. S.—*Plain Paper Prints.* An excellent suggestion was made by Mr. Valentine Blanchard, in 1868, to sensitize and print on the *wrong* side of albumenised paper. By this scheme one finds already in commerce a paper which has undergone the salting process, and the action of light is aided by the presence of a small quantity of albumen which soaks through, but not enough to glaze the prints.

L. E. N.—*Lime-Light Apparatus.* Use coal-gas in place of hydrogen, and rely upon getting your supply of oxygen from one of Brin's cylinders, to save the trouble of making it for yourself. The lime balls or cylinders are best preserved in closely fitting tin cases; they shrink rather than expand by use, in consequence of the fritting and crystallization of the lime.

COLLODION.—*The Preparation of Enamel Collodion.* Methylated ether and alcohol will answer sufficiently well. Details are given in Captain Abney's "Instruction in Photography," pp. 255 and 256, together with the following formula:—

Soluble guncotton	48 grains
Alcohol	4 ounces
Ether	4 ,,

M. E. T.—*Celluloid Films.* Although these undoubtedly contain camphor as one of the ingredients of their composition, there is no evidence of any prejudicial action being exerted upon the sensitive emulsion with which they are coated.

R. E.—*Blue-Black Ink for Transfers.* If you find any difficulty in procuring the Victoria green for mixing with magenta to produce the blue-black ink, it is equally possible to employ the common malachite green, which is cheaper and answers quite as well. For violet ink, use 3 B. Hofmann or extra methyl violet.

W. MORGAN.—Mr. W. T. Wilkinson's "Manual of Photo-Engraving and Photo-Lithography" is not yet reprinted. Apply to Messrs. England Brothers, 25, Charles Street, Notting Hill, W.

TYRO.—*Varnish for Gelatine Negatives.* Messrs. Burton and Pringle recommend orange shellac 1½ ounce; methylated spirit 1 pint. When dissolved add a tea-spoonful of powdered chalk (whiting); shake up well, allow to subside, and filter.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1651.—*April* 25, 1890.

CONTENTS.

THE NEWCASTLE INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

LAST Friday night the Newcastle International Photographic Exhibition, which is held in the Central Exchange Art Gallery, was opened by the Mayor of Newcastle, Mr. Thomas Bell. The Exhibition will remain open until Saturday, May 3rd.

In the Exhibition nearly a thousand photographs are upon view, and most of them of excellent quality. As at other good exhibitions, prints on albumenised paper are far less numerous than would have been the case some years ago, yet the proportion of warm-toned photographs is large, the idea being somewhat prevalent that platinum prints are, in some instances, too cold for artistic portraiture. Among the exhibits are prints of a pleasing brownish colour, obtained by Blanchard's platinum-toning method. Mr. Lafayette, Mr. F. W. Edwards, Mr. J. P. Gibson, and others, exhibit many of the photographs which they placed on view at the recent Crystal Palace Photographic Exhibition. Some fine specimens of artistic photography produced by photo-mechanical processes are placed on view by Messrs. Boussod, Valadon, & Co. (Goupil & Co.), Messrs. Braun and Co., Dr. P. H. Emerson, Mr. W. L. Colls, Messrs. Aitken, Dott, & Son, and the Autotype Co. Pictures by foreign exhibitors are not numerous; they come almost exclusively from America, and as they are hanging upon the same screen as a number of Rejlander's photographs, they are subjected to fierce competition so far as attracting public attention is concerned, but they are of excellent quality. One photograph of a little girl drinking out of a large mug, with her two little black eyes shining over the white edge of the mug like beads, is specially noteworthy in the American collection.

There are but three or four stalls devoted to apparatus in the Exhibition, and they contain nothing particularly special in the way of novelties. A little tin washing trough for plates, invented by Mr. Tylar, is on view in one of them; it is remarkably simple in construction, and, when placed under running water from a tap, is designed to tilt itself over, and empty itself of water every now and then, resuming, meanwhile, its normal position.

The Newcastle and Northern Counties Photographic Association, which has opened the present Exhibition, was founded in 1881, and has now about 110 members. Its president is Mr. A. S. Stevenson, of Tynemouth, who also took an active interest in the earliest Newcastle Photographic Society, founded a quarter of a century ago. One of its vice-presidents is Mr. J. P. Gibson, of Hexham, a skilled landscape photographer, who has contributed much excellent work, including some cloud studies, to the present Exhibition. The other vice-president is Mr. H. R. Proctor, F.C.S., who treats photography from a chemist's point of view. The secretary to the Association is Mr. Edgar G. Lee, with whom, for the purposes of the Exhibition, Mr. James Brown has been appointed adjoint secretary. The Newcastle Photographic Association has seven indoor and five outdoor meetings during the year, and in the winter months it has three or four lantern demonstrations, open to members and their friends, in the Lecture Hall of the Newcastle Literary and Philosophical Society. These lantern meetings are found to be highly popular, and to contribute to the welfare of the Association to a considerable extent. In Newcastle it is found that, as a general rule, professional photographers can afford to pay a higher annual subscription for membership than can the amateurs, consequently some time ago the annual fee for membership was reduced to one-half, to the increase of the number of the last-mentioned class of workers.

Mr. A. S. Stevenson is a model president, who works actively, and exerts himself to bring new members to the Association. He is a veteran in our ranks, for in 1852 and 1853 he lectured on "The New Art of Photography" in the hall of the Literary and Philosophical Society at Newcastle. A preliminary meeting to form a "Northumberland and Durham Photographic Society" was held in the rooms of the Literary and Philosophical Society of Newcastle-on-Tyne on the 21st April, 1854.

Mr. Robert S. Newall was in the chair, and amongst those present were W. B. Scott, Alex. S. Stevenson, J. W. Swan, Geo. S. Brady, John Mawson, W. S. Parry, Dr. Embleton, J. W. Swinburne, John Storey, G. C. Warren, A. G. Gray, and J. Brown. At an adjourned meeting Mr. Newall was elected President, and Messrs. Stevenson and Brady, Secretaries, Mr. Stevenson to act also as Treasurer. The Committee consisted of J. W. Swinburne, W. B. Scott, A. G. Gray, Jun., John Mawson, J. W. Swan, John Brown, and W. S. Parry. At subsequent meetings various papers were read; one of them was by Mr. G. S. Brady, on "The Application of Photography to the Delineation of Microscopic Objects"; Mr. J. W. Swan read a paper on "The Province of Photography"; and in February, 1855, the Society held an exhibition of photographs, in conjunction with a *conversazione* of the Literary and Philosophic Society. From the removal of members and other causes the Photographic Society after a time ceased to exist.

Last Friday evening, before the formal opening of the Exhibition, a dinner of the members of the Society and their invited guests took place at the Moseley Street Café, with the President of the Society, Mr. A. S. Stevenson, in the chair. Upon his right was the Mayor of Newcastle.

The Chairman read the following letter from an artist, Mr. Arthur H. Marsh:—

"I am interested in photography for its own sake and for the sake of art generally. I wish your exhibition every success. My excuse for writing to you on this subject is that having done a little in photography myself during the last four years, I have become convinced that for the artist the 'detective' is the camera of the future. I know to my cost the utter impossibility of successfully catching groups of figures in the field and on the seashore, boats, animals, &c., that are constantly moving, and many of which have disappeared altogether before the operator emerges from under the focussing cloth. But a 'detective' camera does away with all this by being always in focus beyond a given distance, and wasting no time in changing slides, &c. When so many distinguished photographers are gathered in the neighbourhood I think it would be interesting and useful certainly to members of my profession if they would give the benefit of their experience, and tell them which is the most serviceable instrument of this class for taking instantaneous studies out of doors. The American Kodak has one great advantage in containing the means for taking so large a a number of pictures. I need not say that for this purpose the more inexpensive the camera the better." [The letter was handed to Mr. Lange for future consideration.]

The Mayor of Newcastle, in response to a toast from the Chair, said that he had much pleasure in being their guest that evening, and as chief magistrate of the city he had pleasure in offering the visitors a hearty welcome. The Society had provided, he was told, an especially interesting photographic exhibition for the people of Newcastle and its vicinity, an exhibition which the judges had told him to be of a high order. He had not yet seen it himself, but was informed that it was one worthy the position which Newcastle enjoyed in this country. He was pleased to hear that representatives of the art of photography were there from the whole country; some of them, indeed, had travelled long distances to be present. Some of the photographs also had come from foreign countries, and the pictures sent from America were among the best the art could produce, so he felt sure that the Newcastle Photographic Exhibition would have all the success it merited. Newcastle, indeed, always rose equal to the occasion. Exhibitions of late years, now that art and science are making such great strides in all directions, have become almost a national necessity, and he hoped that the present one in Newcastle would prove satisfactory to its promoters and friends. He had much pleasure in proposing the health of the judges of the pictures at the exhibition, Messrs. Paul Lange, William Lang, junr., and John W. Wade, who had come long distances to give the benefit of their ability and experience.

Mr. Paul Lange said that when he came to Newcastle he was not prepared to see all that he had seen, and he thought that the Exhibition which would be opened that evening was one of which Newcastle might well be proud. They had, in the midst of them at Newcastle, workers in the photographic art such as were equalled at very few places in the United Kingdom. Among the professional members of the Society were some of great ability. Such workers tended to raise photography, and photography had a great future as an art; he believed that it would become capable of producing results which would equal the work of any painter who ever lived. The pursuit of photography had an elevating power, and the fathers of families could have no better desire than for their sons to pick up photography, not necessarily merely as a hobby, for photography will become an art some day, and it always improves the mind of the worker, and his appreciation of the beautiful. None could portray the beauties of nature without being influenced for good. Every father who has a son who picks up photography should encourage him to live up to it. He considered photography to be still in its infancy, and that in Newcastle that evening they would show by their Exhibition that of late years it had much advanced. Their mayor had been good enough to undertake to open the Exhibition, and that would give it prestige. The Society was also greatly indebted to the actual workers in the undertaking, to the general executive, to the two secretaries, and to Mr. Gibson (vice-president), who all deserved to receive gold medals. The only dilemma the judges were in was that of so distributing the awards as to please everybody. He did not believe that such judges ever existed; but they had tried their utmost; as far as was in their power they had gone by merit only, and their decisions had been unanimous.

Mr. J. P. Gibson, in responding to the toast of the executive, spoke highly of the work done by the two secretaries, Mr. Lee and Mr. Brown, and their energy in getting the catalogue out in time for the opening of the Exhibition.

The Chairman then proposed "The Press," coupled with the names of Messrs. Harrison, Hastings, and Welford, who briefly responded; after which Mr. William Lang proposed the health of the President of the Newcastle and Northern Counties Photographic Association.

Mr. Stevenson, in response, said that few things would give more pleasure in life than the practice of the art they followed. There was no art, no employment, which tended more to elevate the character or give healthy employment than photography, which combined science and art in a way no other employment did, and it always gave him the greatest pleasure to meet photographers. In them he found men of intelligence—men who had an eye to the beauties of nature, men who saw with the inner eye where the beauties of nature lay, and had the great pleasure of revealing them to their fellows. Art and photography were immediately allied. He did not go so far as to think that photography would ultimately annihilate the work of the artist. He believed that it would aid him in many ways, but would never come up to the transfiguration of the beauties of nature which artists could depict. They had been asked there to meet the judges and show kindly appreciation of the work they had done.

Mr. H. R. Proctor gave the health of the Mayor, a toast which was received with cheers, after which Mr. Lange called for "one cheer more for all the little Mayors."

The Chairman: "Well, there's something in that, for three of them are photographers."

The Mayor stated that they had started with the intention of having but two toasts, and now they were quadrupling them. (The Chairman: "The mair' the merrier!") He thanked them, and said that he was extremely pleased to be with them all that evening, especially in connection with photography, a subject which had taken hold of the minds of the

people to a considerable extent of late years, so that nobody now cares to go meandering in the country without taking his camera with him. In this way photography added a new charm and interest to life.

The company then adjourned to the Exhibition, and the following speeches, which we quote from *The Newcastle Chronicle*, were made :—

The Mayor said that photography interested us and made our lives much more pleasant than they would otherwise be. In opening that exhibition, he felt that he was engaged in a very important work. Their friends, Messrs Barkas and Son, gave them a great many interesting entertainments, but they never provided anything so engaging and at the same time so interesting and important as that exhibition was. It was not of local interest only ; it was of national importance. He understood from the judges, whose acquaintance he had made that night, that it was a collection which compared favourably with, and almost surpassed in quality, any exhibition that they had had an opportunity of witnessing during some years past. The photographic press in London was also represented there. All of them who were in the habit of travelling—whether as tourists, pedestrians, as cyclists, or in any other capacity—must find that their little tours were much enhanced if they could carry with them a camera, and bring back with them pictures of the places they had visited. It was an inexpensive art, an art that was easily acquired, and it was an art that carried with it a great deal of interest. It had entered into our every-day life to a most remarkable extent. It had enabled us to form a most intimate acquaintance with almost all peoples and all countries. They seemed to know intimately the Emperor of China, or the Emperor of Russia, or Prince Bismarck, or Mr. Gladstone—just as well as they would recognise their friend the Sheriff of Newcastle. And if they cared to collect landscapes drawn from the centre of America or the centre of Africa, they had no difficulty in doing so. Photography was an art which had made enormous progress during the last twenty or thirty years. It was an art which was resorted to by the architect, the artist, and the engineer ; and, in fact, in pure science it had become almost invaluable. The astronomer, by the aid of photography, had been able to map the stars. They only wanted now to be able to reproduce colours. He had very great pleasure in declaring the exhibition open, and in doing so he desired to mention that the arranging of the Exhibition had been largely carried out by the secretaries, Messrs. Lee and Brown, aided by Mr. Gibson. He thought that, on behalf of the committee and on behalf of the visitors, thanks were due to those gentlemen. He concluded by proposing a vote of thanks to the judges.

The Sheriff seconded the motion, which was carried.

Mr. Paul Lange, in responding on behalf of the judges, said that in coming to Newcastle they did not quite expect to see such a treat in the way of an exhibition as they had seen and judged that day. He thought that the Newcastle people ought to be proud of the works that had been produced amongst them. They had among them a contingent of photographic artists such as very few societies in this kingdom could boast of. As president of the Liverpool Society—a purely amateur society—he would be proud if they had there such talent ; and he hoped that this cultivated and elevating hobby, as they called it, amongst amateurs, would take root amongst more of them. They saw around them pictures which very few towns could show, and he hoped that the people of Newcastle would appreciate the efforts of their townsmen. He wished every success to the Newcastle Exhibition.

Mr. Paul Lange then delivered a lecture on "A Tour in Norway," illustrated by over 130 slides.

The following are the awards of the judges :—

Classes (A to Q) open to Professionals and Amateurs.

The gold medal for the best three pictures in the exhibition is awarded to J. Lafayette, of Dublin. The following were the prize-taking pictures out of twenty-three exhibits by this contributor :—Portrait of Mrs. Langtry (211), portrait of Miss Moody (213), portrait of a lady and child (215). Mr. Lafayette thus secures the highest award of the exhibition. The gold medal is awarded by the Association for the best three pictures irrespective of class. The silver medal, together with a bronze medal, is presented by Mr. J. P. Gibson, of Hexham, for a series of three portraits. The winner of the bronze medal is Mr. W. J. Byrne, Richmond, Surrey, with No. 177—three portraits "direct and untouched" ; 179, six "At Home" panels representing the present Emperor of Germany at Osborne ; and 180, ten "At Home" panels representing various people, taken by daylight at the sitters' residences.

The following is a list of prizewinners according to classification, excepting, of course, class D, which has been dealt with in the preceding paragraph :—

Class A. — Landscape (above whole-plate). Silver medal—Green Brothers, Grasmere. Nos. 44, 45, 46. Views of Stybarrow Crag, Ullswater; Blea Tarn, Langdale; and Derwentwater and Skiddaw from above Lodore. Bronze medal—Mr. J. P. Gibson, Hexham, for "The Thaw" (18), "Autumn Haze" (21), and "September" (22).

Class B.—Landscape (whole-plate and under). Silver medal—Mr. J. P. Gibson, Hexham, for three out of a very remarkable exhibit of forty-seven frames, viz., "Out for a Holiday" (65), "The Banks of Tyne" (70), and "A December Morning" (77). Bronze medal—J. E. Austin, West Court, Detling, Maidstone, for "The Last of the Ebb" (120), "Listening to the Bells" (121), and "By the Tow Path" (122). Extra bronze medal—J. G. Bullock, with "Moosehead Lake, from Kineo" (132), "On the Wawasett" (133), and "Birch Trees at Kineo" (134). Medals presented by Mr. Auty, Tynemouth.

Class C.—Silver medal (for best landscape printed on gelatino-bromide paper, direct or enlarged—both original, negative and print to be the work of the exhibitor) presented by J. B. Payne, Newcastle—awarded to Messrs. Auty and Ruddock, Tynemouth, for view on the Irthing (175).

Class E.—Best portrait printed on gelatino-bromide paper, direct or enlarged. Silver medal presented by J. Wilson Swan, M.A., Newcastle—awarded to Messrs. Auty & Ruddock, Tynemouth, for "Miss Maudlin" (284).

Class F.—Architecture, interior or exterior. Silver medal (for series of three)—Richard Keene, All Saints', Derby, for frame of six interiors of Derbyshire churches (318). Bronze medal—W. Parry, South Shields, studies of St. George's, Jesmond (Nos. 329, 330, 331).

Class G.—Series of three instantaneous pictures. In this class a silver and a bronze medal were offered, but the judges award a silver medal each to W. Parry, of Shields, and Lyd. Sawyer, Newcastle, whose winning exhibits are considered equal. Mr. Parry's pictures are numbered 358, 359, and 360 ; Mr. Sawyer's, 370, 372, and 376.

Class H.—Genre. An extra silver and an extra bronze medal are awarded in this class. Silver medal awarded to F. Whaley, Doncaster, for "Your Turn Next, Sir!" (389). Extra silver medal—R. S. Redfield, Philadelphia, U.S.A., for "Victuals and Drink" (463). Bronze medal—W. W. Winter, Derby, for "Does Granny like Butter" (418). Extra bronze medal—F. M. Sutcliffe, Whitby, for "Excitement" (381).

Class J.—For best enlargement (any subject except portrait). Silver medal—T. G. Whaite, Carlisle, for a view of Dinant Cathedral and Market Place (500). Bronze medal—Green Brothers, Grasmere, for "Y Tryfan and Llyn Ogwen, North Wales" (489).

Class K.—Cattle studies. Silver medal—J. E. Austin, Detling, Maidstone, for "Cooling Waters." Bronze medal—Ralph W. Robinson, Redhill, Surrey, for "Suspicions" (512).

Class L.—A genre competition for the best study illustrating verse 17, Canto I., of Scott's "Lady of the Lake." There were only three entries, and the judges made no award.

Class M.—Best enlargement upon Ilford bromide paper. Gold and silver medals presented by the Britannia Works Company. Gold medal—W. W. Fry, Tynemouth, for view of Cullercoats Bay (539). Silver medal—H. Dudley Arnott, Gorleston, Great Yarmouth, for "Main Entrance, Somerleyton Hall" (538).

Class M.M.—Best series of three prints on Alpha paper. Gold and silver medals presented by the Britannia Works Company. Gold medal—F. W. Edwards, Peckham Rye, London, for five bas-reliefs after G. Tinworth, the well-known sculptor, and a reproduction of an old engraving, "Hector Rebuking Paris" (554, 555, 558). Silver medal—J. E. Austin, Detling, Maidstone, for "Rest and Refreshment" (550), "Waiting her Turn" (551), and "Early Spring" (552).

Lantern Slide Section.

Class N.—Landscape, best series of six. Silver medal—R. S. Redfield, Philadelphia, U.S.A., for No. 663. Bronze medal—G. W. Wilson and Co., Aberdeen, for No. 669.

Class O.—Series of six instantaneous slides. Silver medal—Henry Little, Twickenham, London, for No. 681. Bronze medal—W. Parry, South Shields, for No. 683.

Class P.—Series of six architectural slides. Silver medal—G. W. Wilson and Co., Aberdeen, for No. 696. Bronze medal—Jas. A. Sinclair, Bootle, Liverpool, for No. 694.

Class Q.—Best six slides on the Mawson lantern plates. Gold and silver medals presented by Messrs. Mawson and Swan. Gold medal—J. E. Austin, Detling, Maidstone, for No. 700. Silver medal—W. Parry, South Shields, for No. 710. Extra silver medal—Edgar G. Lee, Cullercoats, for No. 708.

Class U.—Stereoscopic slides on glass. Silver and bronze medals presented by J. Hedley Robinson, Tynemouth. Silver medal—H. G. Ridgway, Sunderland. Bronze medal—F. Howard, Wallingford, Berks.

Classes Open to Amateurs Only.

Class R.—Series of three landscapes, half-plate or under. Silver and bronze medals presented by Mr. Alex. S. Stevenson, J.P., Tynemouth. Silver medal—C. Court Cole, Folley Bridge, Oxford. Bronze medal—J. W. Evans, Wolverhampton.

Class S.—Series of three architectural studies, interior or exterior, half-plate or under. Silver medal—C. R. Pancoast, Waterbury, Conn., U.S.A. Bronze medal—Ernest Beck, Sheffield.

Class T.—Three instantaneous pictures, half-plate or under. Silver medal—Ernest Beck, Sheffield. Bronze medal—Martin J. Harding, Shrewsbury.

Class V.—For best landscape by an amateur member of the Association. Silver medal—James Brown, Newcastle-on-Tyne. Bronze medal—Geo. Proud, Newcastle-on-Tyne.

The judges were Messrs. Paul Lange, William Lang, Jnr., and John W. Wade.

PHOTOGRAPHY IN FICTION.

In a holograph letter preserved among the Cotton MSS. in the British Museum, written by Henry VIII. to his "owne good Cardinall Wolsey," the king, after thanking him for his many services, beseeches him to "take some pastime and comfort, to the intent you may the longer endure to serve us, for always pain cannot be endured." This somewhat selfish application of the old proverb, "All work and no play makes Jack a dull boy," might also be used by the general public to the pains-taking photographer, toiling continually in optical and chemical research. This good, general public—"the many-headed beast," as it has been called by poets without sufficient respect—may be conceived as addressing the photographer thus: "Do you also take some pastime and comfort in your scientific labours, to the intent you may the longer endure to take our portraits!" And such photographers as will not be moved far away from their camera and their chemicals may, it is hoped, find a pastime and comfort of kin to their photographic pains in the present paper.

A certain Octavius Winslow, D.D., the author of many pious homilies, printed, many years ago, a sermon on "The Coming of our Lord, the Hope and Consolation of the Bereaved." In this sermon, in the course of what he calls a cursory reply to the interesting but obscure question whether mutual recognition will form part of the rapture of the glorified saints in heaven, he tells us that no being and no transaction will be forgotten, and that a remarkable discovery, said to have been made recently in the anatomy of the eye, supplies a striking illustration of this thought. "It has been discovered," says Dr. Octavius Winslow, "that the last image formed upon the retina of the eye of a dying person remains impressed upon it as on a Daguerrean plate." Thus, if the last object seen by a murdered person was his murderer, the portrait drawn upon the eye will remain a fearful witness in death to detect the guilty and lead to his conviction. "If," says the Reverend Octavius, "such be the ineffaceable, indestructible impressions of last objects upon the eye, how much more ineffaceable, unalterable, and indestructible must be the impressions of the mind." The fervour of the ecclesiastic may excuse in the above extraordinary sentence the faults of the logician.

More than one fiction has been founded on this "remarkable discovery" in the anatomy of the eye. Some thirty years ago an extraordinary tale, depending for its chief interest on a photographic experiment, appeared in a periodical of the period. It is a tale of two lovers, with whom all proceeds smoothly for a time. The parents are favourable to the marriage, and no obstacle arises to oppose their wishes, until unfortunately the expectant bride is one day found strangled in a wood. The lover for a year or more before the murder has taken a great interest in photography, and while contemplating the corpse of his mistress an idea—for perfect love, we are told, excludes every other feeling—occurs to him that a photograph of the retina of the eye might be magnified so as to present a distinct image of the last object depicted upon it. Upon this idea he engages a surgeon to remove one of the eyes of his late beloved from its socket—for perfect love excludes every other feeling. Having taken a number of negatives this eye on glass, it is restored to its proper place. By a judicious combination of lenses, and by very slow degrees, he finally obtains an enlarged representation of the

features of the murderer. The rest of the tale, which is a long one, is made up with a recital of his adventures in a single-handed search for the assassin—under the guiding light of his photographic polar star—through Paris, Baden, Berlin, Vienna, and other places till he arrives at Venice, where he at last discovers the object of his inquiries by a chance encounter at a ball. The murderer turns out to be the brother of his late betrothed, who has assassinated her with a Venetian dagger for the sake of her money, and is at the time of his detection married to the amateur photographer's sister. This introduces a complication. The sister, on hearing of her husband's delinquencies, becomes insane, the criminal is suffered to escape, and the author thus concludes his story: "I have no hesitation whatever in saying that in all cases where death occurs in broad daylight, and especially when it is caused by similar means, the last object on which the eye rests will be found depicted on the retina after death, and from darkness may be brought into light."

In all fictions of this class, and they are many, the delusion is what Bacon would call an idol of the market. People not accustomed to inquire with the ancient Bereans whether these things are so, not uncommonly suppose that impressions on the retina of the human eye are permanent, or that final impressions are so, or, at least, that final impressions endure some considerable time. And so, as in the tale, we read of reports of the capture of murderers through their likenesses being left in the eye of their victims, and afterwards transferred to paper by an ordinary photographic process, which gives a sort of carte-de-visite, showing not only the threatening aspect of the assassin, but also his form and clothes, together with pistol, knife, dagger, or other lethal weapon which he has employed. Now, a little consideration would soon expose the fallacy of this conception. A person entering a room having a plane mirror opposite the door of entrance is, of course, reflected therein, but with that person's disappearance the reflection also immediately disappears. If it were possible to photograph from the looking glass the reflection of that person after he has left the room, then, indeed, it might be a rational undertaking to attempt to photograph the impression supposed to be left on the retina of the dead. It may be true that the image on the retina does not subside and vanish for the fraction of a second, but that fact does not altogether justify the doctrine of the country magistrate who, when consulted as to the advisability of calling in the aid of the camera for the detection of a culprit, sagely observed that such a proceeding would be useless, as the man was already four days murdered, and the picture on the *cornea* of the eye vanished, as scientific men were well aware, after a period of forty-eight hours. The author of the tale already quoted asserts that the duration of the image is affected by the condition of the humours contained in the eye, and that when death is caused by strangulation, the eye becomes charged with a viscous secretion, which is not withdrawn, but coagulates and hardens, so to speak, as vitality is expelled, and so the last image impressed on it is retained precisely as the picture is retained on the photograph which the light has printed on it with the most delicate gradations of tone.

(To be continued.)

Photographic Society of Great Britain.—A technical meeting will be held on April 29th, at 8 p.m., at 5A, Pall Mall East, when the subject of "Celluloid Films" will be brought forward.

DETECTIVE PHOTOGRAPHY.

BY J. C. HANNYNGTON, MADRAS.

To detect or identify the lad who purloins your fruit whilst you are absent at morning service, is simple work.

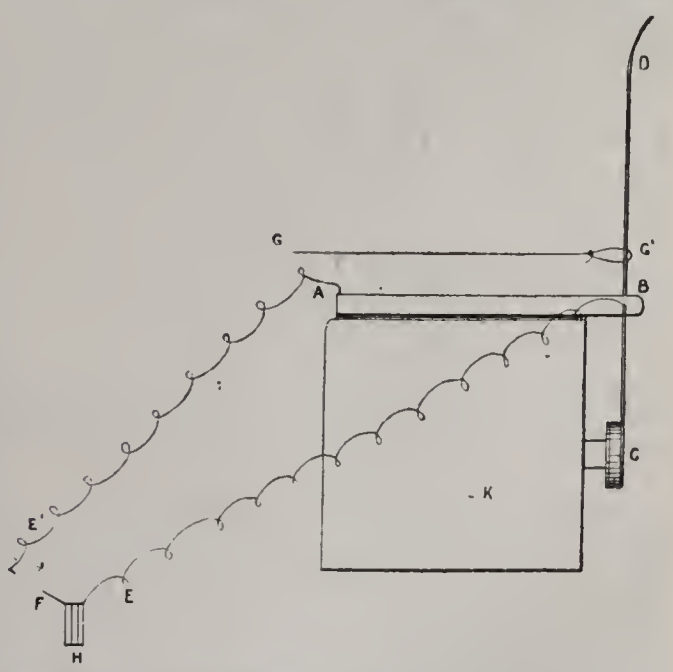
The camera, in some unobtrusive form, is concealed in a position which commands the approach to the forbidden fruit; the shutter (a simple drop) is kept fixed for action by a wedge, which wedge is attached to a hair line (a single thread of woman's hair will suffice) which is stretched across the path along which the approach to the tree must be made.

As the thief walks along the path he touches the line, the shutter is released, and the exposure made. When it is desired, however, to secure a photograph of any person or animal which may pass along a given path by night in the dark, the procedure is more complicated.

The camera commanding the approach must be placed as above described. If it is certain from which direction the approach will take place, one camera will suffice; but if the direction of approach is uncertain, two cameras may be necessary to secure a front view of the subject.

It will be necessary to secure the picture by a flash-light, and the conditions required are that the lens shall be uncapped at the moment the flash takes place, and at the moment the subject reaches a given point within the range and focus of the lens. It will not do to leave the lens open all night, lest it should be frosted by dew or exposed to the morning light.

It is easy to arrange a line and trigger on any path,



so that any creature passing along the path will pull or release the trigger, and the trigger may be made to fire a gun, explode a mine, or fire a flash light of any kind.

The following method is simple and effective, and may be varied according to the ingenuity of the operator. On the top of a camera, K, or preferably detached from it, is fixed a rod of wood, A B, with a pivot at B, upon which a lever DC carrying the lens cap at C, swings easily. The lever CD is of metal, and is placed in electric communication with one pole of a battery, H, by the wire E. The wooden rod, A B, carries at the end, A, a metal point or bar which is in electric communication with the other pole of the battery through the wire AE'. When the lever, CD, is depressed so that the metal thereof at D

touches the point or bar A, the circuit of the battery is completed, and a fine platinum wire at any interval, F, in the wires EE', will be made red hot.

There may be any number of intervals, F, each being constructed of fine platinum wire, and, if the battery be of sufficient intensity, the wires at all the intervals will be simultaneously and instantly heated. The lever, CD, is so arranged that when in its normal position the weight of the cap C will keep the cap C' entirely over the lens of the camera, and so completely exclude all light or damp from the lens. GG' represents a line of hair, cord, or wire, having at the end G' a loop which passes over the lever, CD.

If the line, GG', is pulled back, it depresses the end D of the lever CD, and raises the cap, C, until the lens is wholly uncovered, and finally the end of the lever DC will come in contact with the point A, the electric circuit will be completed, and the wires at the intervals, F, will be heated. The line, GG', is extended round trees, or in any convenient manner, until it crosses the route by which the subject to be photographed will pass, and is then made just taut, and fastened securely.

It is clear that any person or animal passing along the route and coming in contact with the line, must stretch the line so that the loop G' must go back, carrying with it the lever, CD, until the electric contact is made.

Immediately subsequent to this, the loop, G', is carried over the end, D, of the lever, and the cap, C, swings back by gravity, and re-covers the lens securely. At the intervals, F, are placed, on the platinum wires, charges of gun-cotton and magnesium powder, or any other form of flash-light which may be preferred, and, as these charges are fired whilst the lens is fully uncapped, a photograph can be taken. The height of the line should be adapted to the subject, the height of a man's knee being most generally useful. The charges and intervals should be so arranged that the light of the flashes, whilst fully illuminating the subject, do not strike on to the lens of the camera. The system of laying the detector line is merely a modification of the method of setting alarm guns, in every-day use for poachers.

In practice, it will be found necessary to pass the line, G G', through a loop somewhat below the level of the wooden bar, AB, as otherwise the lever CD will not be sufficiently depressed.

Oldham Photographic Society. — The hon. secretary forwards us a list of outdoor meetings for the coming season. One page of the programme contains the photographs of the officers of the Society by the Vice-President, Mr. W. Thompson, which are very good.

The Photophane Printing and Publishing Company send us a prospectus from which it appears that the company has been formed to take over and further develop the business now carried on by Mr. Andrew D. Edward and others, together with the photographic business and plant of Mr. F. W. Edwards, of Peckham Rye, the president of the East Dulwich Photographic Society, and the recipient of twelve medals at photographic exhibitions, the last being a gold one awarded him at the present Newcastle Exhibition. Photophane is described in the prospectus as a "process for mechanically printing photographic negatives," and is briefly thus described :—"A negative being taken in the ordinary way, instead of being printed by the action of light on sensitized paper—every copy taking hours to print, and eventually fading by the influence of the same power which printed it—is printed on a sensitized, *i.e.*, a photophane, plate. The plate is then placed on a machine, and copies printed off at the average speed of about one thousand per day."

LIMITATIONS IN THE TREATMENT OF SUBJECTS BY FOCUS.*

BY T. R. DALLMEYER.

There are only five treatments of the subject by focus possible :—First, the pinhole ; second, sharp photographs throughout ; third, contrasted definition between different planes with an aplanatic lens ; fourth, the introduction of positive spherical aberration ; and fifth, the introduction of negative spherical aberration. The last I do not intend to speak of, as it is of course the converse of the fourth, but is a treatment that is hardly ever required in practice.

First, the pinhole. I have spoken of the imaginary pinhole for mathematical accuracy, and the practical pinhole is an instrument that coarsely imitates it, every mathematical point in the object being represented by a cone of rays limited by the aperture of the pinhole itself, and the distance of the sensitive film from the pinhole, the pencils being represented by a series of small circles, becoming greater in diameter the greater the obliquity, or the more the angle of subject included. Theoretically, the foreground is exaggerated in size in true drawing, and the distance dwarfed and better defined ; but the pencils are so small that one would not appreciate it. The general effect is one of *uniform softness through all planes ;* it is seldom art, for the unaided eye cannot receive the same impression.

Second, sharp photographs throughout. It is well known that if the nearest object in a picture to be taken is sufficiently distant that the rays coming from it to the lens may be considered practically parallel, all planes more distant will be sharp ; or there is for every lens a plane at some distance distant, beyond which everything may be considered as topographically sharp. The nearer this plane is desired to be for a given lens, the more it must be stopped down, or the less does its intensity become ; if this is so arranged that at the normal distance of vision the out-of-focus circles of indistinctness throughout the picture do not exceed one-hundredth or less part of an inch, or the circles subtend an angle of less than two minutes of a degree at whatever distance the picture be viewed, such a picture, to all intents and purposes, is a truthful record in drawing, granting that the angle included be no more than the eye is capable of taking in ; or, on the other hand, that it be viewed at a distance of the focus of the lens itself.

This rigid exactitude, and the brilliant results obtained, are pleasing and popular mementoes, but can hardly be termed art. It is the simplest form of all photography, for the instrument gives an exact copy of what is placed in front of it, and no personal judgment is wanted to produce any truthful effect, such as the scene in reality conveyed to the brain by the eye itself. I will dwell on this later, and prove the contention.

Under the same heading as universal sharpness naturally comes the uniform out of best focus treatment with the aplanatic lens. This effect is easily produced by the instrument under conditions precisely the same as those just mentioned, and then to slightly wheel *out* the camera back. The evil in such a case to be guarded against is that this process should not include a foreground nearer than the first plane to be depicted, or it will have a better focus, and probably attract undue attention. The distance at which the picture is eventually to be viewed will, of

* Continued from page 305.

necessity, have a great influence on the amount of out-of-focus effect allowable. It is a parallel with the pinhole and (in one way) the uniform sharp treatment, and I therefore place it under the same category, *pro tem.* The process tends from original definiteness to pass *uniformly* to indefiniteness and weakness, from structure to destruction of structure. The points in the object, instead of being concentrated to points in the image, have passed their best focus, and are diffused into uniformly illuminated circles of a weaker character. It may be said to give a uniformly broader treatment of a subject, but as it rests somewhere between perfect concentration and brilliancy, and destruction of structure and consequent weakness, it must tend, as a process, to uniformly weaken. It is defined and determined by the size of the out-of-focus circle of uniform indistinctness chosen, or ascribed to the pencil, after having passed the plane of best definition.

Third, contrasted definition with an aplanatic lens. That this may occur in any photograph, the lens employed must be of such a focus and intensity (or ratio of aperture to focus) that the plane in the object that is most favoured by definition is so situated that planes nearer to or further from it have conjugate planes distinctly and appreciably different from that on which the chosen plane is received by the plane of the plate.

As the plate is a fixture, points in these out-of-focus planes will be represented by circles of indistinctness, varying in size according to their distances from the chosen plane of finest definition.

It follows then that, strictly speaking, for mathematical measurement on the one plane of the plate, the drawing is untrue as regards the out-of-focus planes, and increases in this inexactitude, and, in weakness, the more they are removed from the plane of chief interest. I refer you to the first seven plates as showing the tendencies, but it must be borne in mind that equal movements of the camera back inside the focus lose definition more rapidly for the foreground than the same distances outward would affect the background.

Under this heading I also include contrast in definition when the chief feature of interest is not at the best focus given by the lens, or when this feature is once focussed for as best, the camera back is slightly wheeled *out*, as in the second part of the previous head. This treatment requires very careful adjustment and choice of subject, for if any portion of the picture intervene between the subject of chief interest and the camera, it must be better defined than that intended to be of chief interest, and detract from its value as a work of art by diverting the attention to objects practically out of the *picture*.

The difficulties of adjustment between the limits of out-of-focus effect, so as to subdue certain unimportant planes without carrying the tendency to destruction of structure too far, has made this process capable of engaging the skill and judgment of the artist to a much greater extent than the more limited methods previously described. This treatment is undoubtedly far *truer* in its rendering of what the eye actually sees, if the treatment of the limiting out-of-focus planes is not carried to a too extravagant degree. For *truth, as the eye sees*, the palm rests with this treatment, or with—

Fourth, the introduction of spherical aberration. Here the individuality of the treatment by the instrument is again different. As stated before, slightly beyond the least circle of aberration a focus, still more or less definite but softened, is formed by the inward concentration of the image-forming rays more pronounced and powerful than the weaker marginal rays. The latter, not coming to the same focus, produces a faint halo that tends to soften the image, but still *structure* is maintained here. This halo becomes more and more pronounced the greater the amount of spherical aberration introduced; but, at the same time, the greater become the limits between the planes (or the measure of longitudinal aberration) through which the plate can be moved still consistent with partial definition maintaining the structure of the image. But as there is an inward tendency on the further side of the least circle of aberration when positive spherical aberration is present, there is also an outward concentration of rays on the nearer side, tending toward a more rapid destruction of the image than is the case with an aplanatic lens. However, this detriment is not an important factor: first, because the best focus with a lens in which spherical aberration is outstanding is beyond the least circle of aberration, the definition at the least circle of aberration itself comparing very favourably with an out-of-focus circle of the same transversal measurement by an aplanatic lens; and secondly, this outward concentration corresponds in the image to foreground, or to objects nearer than that of chief interest, and this, as a rule, is a negligible quantity compared with the better maintenance of structure in the background or receding planes. By spherical aberration, then, there certainly is *depth* of definition, and in portraiture no artist denies the advantages of the resulting softness, and blending into background as compared to the contrasted definition by an aplanatic lens through such small limiting planes; the eye certainly never saw such contrasts in a single figure as the aplanatic lens of great intensity and long focus gives in a parallel case.

We have now discussed the various treatments possible, and it now remains to select that or those that most nearly represent what the eye sees.

I have several times come across the expression that to produce an artistic photograph we have not to consider only what the eye *can* see so much as what we wish it to see. This is undoubtedly true, but I am not content that the question of the scientific bearing of *vision* on this subject should be waived. I have not read up all the focus controversies, but propose to discuss and analyse a few vital points in the most recent contribution on the subject to the Camera Club by Mr. Burton. 1. One of the tenets of the naturalistic school is that no part of a photographic picture should be as sharp as modern photographic lenses (aplanatic) are capable of making it. Mr. Burton contends that the eye can define equally as well as such a photographic lens when focussed as sharply as possible, and says were this not the case the eye would be equally incapable of defining the reproduction. This is an undoubted error. The use of small stops in aplanatic lenses, even for one plane alone, certainly gives a definition far finer than the eye ever can reach, eg., the reproduction of print in a photograph beyond the distance of distinct vision (explanation on blackboard). "Mr. Burton says the oft-repeated statement that the eye, having certain optical defects, does not define as well as a photographic lens, is a thing simply not true, and recently disproved." He does not quote his authority, but Helmholtz distinctly contradicts this in facetious and no measured terms. To make the comparison above referred to fair, both object and the photographic image must be viewed under the same angle. The conclusion I have come to in cases of normal good vision is, that the image can be seen much

sharper than the object would appear to the most perfect eye. 2. Mr. Burton says that another tenet of the naturalistic school is that only the principal object, or the object of greatest interest, should be nearly as sharp as the lens can make it, and contends that "if an attempt be made to support it on scientific grounds, that attempt must of necessity fail, for there is no optical defence for it."

This is another error. It can be proved by trying *artificial means* to *make* the eye see what the lens can see. The same process must be applied to both eye and lens to place them on an equality in this respect:—Stop them down! The eye unaided has a continually varying focus that adjusts itself to plane after plane as occasion may require. By giving it a so-called fixed focus, the same effect of sharpness through all planes is arrived at as with the stopped-down photographic lens. To prove this to oneself, look through a pinhole close to the eye—a pretty large pinhole will do—and hold some object quite near the eye, with a distant distinct background, and look at the near object. The background and intermediate planes will be equally well defined. Now remove the artificial iris, and the near object alone is distinctly visible. The reverse of the effect is, of course, the case if the eye be focussed for the distant plane, the near one then being out of focus. An artificial diaphragm to the eye of course enables one to see very much nearer than would otherwise be possible, and also enables a short-sighted person to see to a distance. The eyelids, with a short-sighted person, often almost unconsciously serve the purpose of the artificial diaphragm when their glasses are not in use. Binocular vision in sight, too, of course has an important bearing on this head, particularly in the representation of near planes. The axes of the eyes are directed convergently towards one particular point in binocular vision, every other point in the scene producing different images on each eye, causing indistinct double images. The more the eyes are directed to distant objects the less noticeable does this become, the angle subtended by their separation becoming less and less. The treatment of planes parallel to the axis, or marginal definition, is more difficult to attempt on scientific grounds; but as the eye sees distinctly only through a small angle, it seems feasible (and it certainly is noticeable in nature) that there should be a slight marginal falling off of definition in the lens. If the lens of the eye gave a flat field throughout the one plane focussed upon, sharpness through this would undoubtedly be the desideratum. Mr. Burton is the only writer I have found who speaks as an authority against the scientific aspect of the tenets of the school of naturalists, and I regret that he is not here to argue on his side for, or concede the points in, the question.

The single eye then, in a fixed position, and more remarkably in binocular vision, undoubtedly sees nature under conditions of contrasted definition, and hence any method that rigidly gives uniform definition throughout all planes must fail to be artistic.

As to how the method of contrasted definition is carried out by the lens employed must be a matter of individual impression, and the focus and aperture of the lens so adjusted that the image is in effect the nearest possible to that the artist feels and wishes to convey. In this connection the broader treatments, by slightly out-of-focus effect, or introduction of spherical aberration, produce results that artists alone can decide whether or no they compare favourably or not with the broader treatments by the pencil or brush. The answer to this question must decide how far photography may progress as a fine art.

The naturalistic school have shown results that cannot be denied to be eminently artistic, and there is without doubt the qualification of greater scope in their rendering. Dr. Emerson has produced work ranging from the beautiful in bright results to the sublime in the dreamy impressions of twilight and the impressionists' school. As the subject has appealed to the students of this school, so have they rendered it, within the limits of the definite powers of their instruments. There is no hard-and-fast line of one particular treatment, and my object has been to indicate the ground entered upon by leaving the limited and narrow treatment of universal sharpness, a treatment that is a triumph as an instrumental record, but, if taken alone into consideration, is detrimental to that art progress which all of us, anxious for the higher development of photography, have so earnestly and sincerely at heart.

Books Received.—*Photographie Aerienne*, *Photogravure sur Verre*, *Traité Encyclopédique de Photographie*, *Sun Artists* for April, and some new numbers of the *Amateur Photographer's Library*, all of which we hope to notice next week.

The *American Druggist* says that a paste made of rice flour and water, slowly heated to the boiling point until the proper consisteney is obtained, will not discolour articles pasted together, and will stick tighter than a poor relation.

The Birmingham Photographic Society.—The presentation of the Crystal Palace Challenge Cup to the Birmingham Photographic Society took place on Monday last at a dinner held at the Colonnade Hotel, New Street. The cup was officially presented by Mr. Henshaw Russell, who was accompanied by Messrs. S. G. Wollaston, J. F. Peasgood, and W. Brooks. Mr. J. B. Stone presided.

Messrs. Thomas's Prize Competition.—The prize competition inaugurated by Messrs. R. W. Thomas and Co. for the best photographs taken on their plates was held at Gloucester Mansions, Cambridge Circus, London, on April 15th, 16th, 17th, and 18th. The judges were Messrs. Valentine Blanchard, F. de P. Cembrano, J. Gale, Philip H. Newman, and Andrew Pringle. The following prizes were awarded:—Class I.—(10) "The Brent, Kingsbury," silver medal, F. D'Arcis; (40) "Newlyn, Cornwall," bronze medal, J. B. B. Wellington. Class II.—(51) "The Pedlar," special genre class gold medal, Ralph W. Robinson; (55) "An Idle Moment," bronze medal, R. H. Lord; (60) "The Latest News," silver medal, J. B. B. Wellington. Class III.—(80) "St. Anne's Gate, Salisbury," silver medal, J. B. B. Wellington. Sub-Class.—(66) "Reredos, Salisbury Cathedral," bronze medal, J. B. B. Wellington; (71) Frame, three prints, "Norwich Cathedral," silver medal, H. Dudley Arnott; (72) "The Great Pillar, Clapham Cave," (73) "Eldon Hall," do., (74) "Beehive," do., (75) "Pillar Hall," do., (76) "Reflections," do., (77) "Inverted Forest," do., special silver medal, G. Towler. Class IV.—89) "Try again," special genre class silver medal, R. H. Lord; (91) "Granny and her Spinning Wheel," special genre class bronze medal, W. H. Geddes and Son. Class V.—100) "Ready to Start," (101) "Leap Frog," silver medal, W. Jerome Harrison; (107) Hand-camera shots, "North Wales Coast," bronze medal, M. J. Harding. Class VI.—(113) "Large Marine Engine," bronze medal, W. H. Geddes and Son. Class VII.—(118) "Smack at Sea, Towing out a Screw Steamer," bronze medal, H. Dudley Arnott; (120) "The Land's End," silver medal, J. B. B. Wellington. Class VIII.—125) Set of twelve slides, certificate of merit, Lieut.-General Dawson, C.B.; (136) Set of twelve slides, gold medal, Edgar G. Lee; (139) Set of twelve slides, bronze medal, G. E. Thompson; (141) Set of nine slides, silver medal, J. B. B. Wellington. Sub-Class I.—151) Set of six slides, silver medal, A. A. Carnell. Sub-Class II.—None. Class IX.—(152) Eight transparencies, silver medal, Auty and Ruddock; (153) Eight stereoscopic slides, bronze medal, H. G. Brierley.

EMPLOYERS AND EMPLOYED.

BY C. BRANGWIN BARNES.

An attempt has recently been made to start a trades union amongst photographers, and I cannot but think the proceeding an ill-advised one, because since the early days of the art-science, there has up till now been a thorough *entente cordiale* between photographers and their assistants, and until the issue of the trades union manifesto I had heard of but little, if any, dissatisfaction amongst photographic employées. Truly, here and there might be found a stray grumbler, and, for the matter of that, so there might amongst the ranks of the employers. I have heard a photographer express an opinion that there is not a thoroughly good and efficient printer to be found in the United Kingdom, and I have also heard a printer state that there are no employers capable of appreciating a good man when they have found him. Some employers have an idea that all their assistants think about is to leave off work at a certain hour, and to draw their salaries as pay-day comes round: but I opine that most photographic assistants have far higher notions of business and honour than that. One of the most vexed questions between the employer and his assistants has for some time been that relating to specimens, and I should personally like to see the matter thoroughly threshed out in the light of day—*i.e.*, in the columns of the Photographic News—to hear what both sides have to say. When a photographer advertises for an assistant, he usually requires to see specimens of his work, and therefrom arises the question, Whence are those specimens to come?

In nine cases out of ten, all the specimens an operator, a printer, or a retoucher can obtain are spoiled prints, which are hardly the sort of thing required. There has never been an understanding as to whether an assistant is entitled to specimens, or if so, to what extent. There are employers who strictly prohibit their hands from taking prints, whether spoiled or not, for use as specimens: there are also a few who, when an assistant is leaving, offer to provide him with any he may require. Is not the whole question of specimens a farce? If an operator is seeking a situation, what is easier than to send specimens taken by someone else, and purchased by him purely for that purpose? That this is done every day of the week I quite believe, and must at the same time admit that, though the action is reprehensible in the extreme, yet the employer who advertises for specimens is himself to blame. Where is the need of specimens at all, if the reference from the last employer be satisfactory, and that employer be known to turn out good work? Surely those are sufficient grounds for giving a man a trial, without expecting him to send specimens of work, which may be his own or not. One photographer of standing told me that he never looked upon specimens he received from applicants for a berth as samples of what they could do, but merely as samples of their taste; if they sent him good and artistic pictures, he judged that they were artistic themselves, or they would not have selected them.

If an assistant has no right to specimens of his work, I hold that an employer has no right to ask for them: added to which, they are perfectly unnecessary, and cause considerable trouble. Suppose an operator out of a situation answers some four advertisements, where are the specimens to come from to enclose with all his four applications? At the most he would have only one set, and they would probably be sent to the advertiser he would be least likely to suit, and retained by him three or four days, by which time the other situations would be filled up, and very likely a berth lost simply because the operator was an honest man, and did not pilfer from his former employer a sufficient number of prints to send to several persons at one time. The foregoing is merely my opinion. I am in hopes that others may speak out on the matter, and that some arrangement may be definitely arrived at between employers and employed.

Another point which I wish to advocate is the payment of operators by results, in such a way that the best worker may obtain the best income. An operator may receive a stated salary every week of the year, whether business be good or bad, and it is contended that he has a right so to do, as it is not in his power to influence business. My idea is that it is vastly in his power so to do, and it will be found that the operator who is paid by results—that is, a salary and commission—will not only increase his own weekly earnings, but will make business to do so. A word in season, spoken by the operator, will often induce a sitter who has visited the studio with the intention of taking, say, half-a-dozen cartes, to increase the order to a dozen, or to have cabinets in preference to the smaller size, and now and then an order for an enlargement may be obtained in the studio. I would also respectfully incline to the opinion that the operator who pushes his employer's business in this manner deserves a percentage on that business, and that the employer will find it materially to his interest to allow him one. There are times when the operator may fail to obtain an increased order in the studio, but his trial will only serve to clear the way for the reception-room attendant, who may now succeed where he has failed. This same reception-room attendant, if a man or woman of business, has many opportunities of pushing trade, and suggestions as to enamelling, tinting, and so on, often have the effect of adding to the amount of cash taken from each sitter. Then there is nothing to prevent him, or her, from introducing novelties in the way of frames or albums, and here, as in the case of the operator, a small commission on sales would be found to have a stimulating effect. The mention of the fact that old or faded photographs may be copied, often reminds a sitter that he has an old portrait of some deceased relative or friend, of which copies have been asked for, and, perchance, an enlargement may follow. It should always be borne in mind that one enlargement pays better than two or three ordinary sitters for small work.

In conclusion, I would express my opinion that a general introduction of the system of payment by salary and commission would effectively and surely cut the ground from under the feet of would-be trades unionists, and by so doing further strengthen the bond of good will which, I maintain, has always existed between photographic employers and employed.

On Thursday evening, May 1st, Capt. Abney will read a paper at the Camera Club.

Number 644 of the *Photographisches Archiv* is accompanied by an illustration—a woman's portrait—issuing from the studio of Herr J. Schmidt, of Frankfurt-on-M. The extremely careful and exact reproduction of the negative has been furnished by the Phototype Office of Johannes Beyer, in Zittau. Herr Beyer, who some years ago purchased the interest of the firm of Alphons Adolph & Co., has enlarged this concern, and fitted it with all necessary new appliances. Of the phototypic ability of the firm a proof is given in the illustration.

Notes.

The full text of the resolutions passed by the Committee appointed by the International Congress in connection with the Paris Exhibition appears in the *Bulletin de la Societé Francaise* for March, so may be now more readily accessible in this country than the Government report itself, published some weeks ago. A summary of the conclusions arrived at with regard to the various questions submitted has already appeared in these pages, and we need not go over the ground again. It is worth while noting, however, that the philological studies of the Committee appear to have caused them some anxiety. As will be remembered, one of the questions to be discussed and settled was a system of photographic nomenclature, and if it is an absolute necessity that the rough and ready and familiar—though, possibly, inaccurate—terms in daily use should be discarded, then no doubt the Committee have devised the very best scientific substitutes possible. But even science is sometimes baffled, and the word "photo-collographic" has been too hard a nut to crack.

This word has the drawback of being intractable to all efforts to shorten it. The consequence is that its obstinacy has forced a series of kindred subjects to be termed "photo-plastographic," "photo-glyptographic," "photo-typographic," and "photo-chromographic," whereas could an abbreviated equivalent have been found, we should have got *photo-plastie, photo-glyphie, photo-typie*, and *photo-chromie*. One would have thought that "photo-collie" would have got over the difficulty, but this does not seem to have occurred to the Committee, and so the polysyllabic burden has been borne.

The report of the lecture given at the Anthropological Institute last Tuesday, by M. Jacques Bertillon, on the method now practised in France of identifying criminals by comparing their measures with those of convicted persons in the prison registers, will be looked forward to with much curiosity by those interested in the subject. The registers contain the measures of tens of thousands of persons together with their photographs, yet M. Bertillon's method enables the reference to be rapidly effected. It is now pretty well acknowledged that a photograph alone is not to be depended upon as a means of identification, but we are not quite sure whether a measurement is a safer guide. What guarantee is there that the measurer will not make a mistake? Professional measurers who make clothes frequently fall into an error, and there is no reason for believing that a police measurer will be any more accurate than a tailor. Everybody is familiar with the curious fact that while the memory sometimes plays tricks in regard to recollection of faces, it rarely does so in the case of sounds. The face alters with age, but the voice remains pretty much the same. This seems to indicate that a system of identification will not be complete until the phonograph is made use of. Let the sound of every prisoner's voice, and his pronunciation of certain words, be preserved, and additional testimony of identification will be always at hand.

We have on more than one occasion drawn attention to the difficulties under which artists labour when a retouched photograph is sent to them to copy. The grievance is not confined to this country, and we find the *Inland Printer*, an American journal, and one especially noteworthy for the excellence of its photo-mechanical reproductions, following on the same lines. It is quite true that the retouched photograph is an abomination to the artist who has to copy it for newspaper purposes. When all the salient lines of the face are so softened as to be almost obliterated, when an artificial sparkle is given to the eye, and a line of light introduced on the nose, so as to effectually put that feature out of drawing so far as correctness is concerned; then the artist's task of translation is difficult indeed. It is, in fact, impossible to convey much of whatever resemblance the photograph may have to the original, because everything is so hazy, so nebulous. The best likenesses are those which seize the characteristic expression of a face, often conveyed by some little lines near the mouth or eyes, which the retoucher does his best to destroy, because he thinks they are not flattering.

And, unfortunately, this is not the worst. During the last two or three years a craze has sprung up for photographs in so-called "natural colours," ranging from the crystoleum process to Mr. Mayall's latest "discovery." These coloured portraits are terribly misleading, for not only is the expression altered, but often a totally false idea conveyed. In fact, to use the words of the *Inland Printer*, "they are to the artists like so many portraits of the figures in Madame Tussaud's."

The utilisation of one's features as an advertisement is quite a sign of the times. Nothing, in fact, is sacred to the enterprising advertiser. We have seen in England portraits of well-known professional ladies figuring in connection with certain advertisements, but in these cases, so far as we know, the ladies in question have derived no benefit from the exhibition of their features, though it is quite possible that in return for their testimonials the advertiser may have shown his gratitude in a substantial form. They manage these things better in America, as the face has now a distinct advertising value. As a case in point, we may cite the fact that the features of Miss Nellie Bly, who achieved notoriety by her race round the world, will soon be known to every smoker of cigarettes in the States, since a firm of cigarette makers has arranged to pay her a very large sum for permission to use her photograph as the trade mark of a new brand of cigarettes.

THE MATHEMATICAL CALCULATION OF EXPOSURES.*

BY ALFRED WATKINS.

In spite of the imperfections and the jokes levelled at exposure tables, they have proved an aid to many who feel the want of certainty, and the weakness of the older methods. Five axioms may be laid down as the "Grammar of Photographic Exposure":—

Axiom I.—Five primary factors, each quite independent of the others, govern a photographic exposure. They are:—(A) The actinic force of the light falling upon the worst-lighted part of the subject. (P) The sensitiveness of the plate used. (S) The capacity of the subject, or its most non-actinic part, for reflecting sufficient actinic light to the lens to form a photographic image of suitable intensity. (D) The size of diaphragm in relation to the focal length of the lens. (5) The distance of the subject from the lens.

Axiom II.—The value of each of the factors, as affecting the exposure, may be expressed in numerical terms.

Axiom III.—The proper exposure for any given conditions being ascertained, the correct exposure for every other possible combination of conditions or factors may be calculated by mathematical means.

Axiom IV.—The quantity of actinic light reaching the plate, reflected from all parts of the subject, or even one part of the subject, is no guide to the duration of the exposure.

Axiom V.—Two ultimate factors determine the duration of a photographic exposure on any plate, viz.:—(A) The quantity of actinic light reaching the plate, reflected from that part of the subject which reflects least actinic light, and in which detail is required to be rendered. (S) The duration of this light necessary to impress upon the plate an image, approximating as nearly as possible, in inverse intensity, to the visual image of the object in question, is the correct exposure.

For factor A a chemical actinometer is best, a photometer in which the eye is used for the estimation, the light being unsatisfactory for this purpose. The bromide of silver actinometer, as advised by Captain Abney, is simple and effective, the number of seconds taken to discolour it to tint giving the A value.

The only proper way to test the light is just where it falls upon the subject. An actinometer will soon become as indispensable to a photographer as a thermometer is to a chemist, and the usual advice to test the light in the open, and if you are about to take an interior, to calculate what proportion of the light reaches the subject, is just as absurd as for a chemist wishing to ascertain the temperature of a mixture he is heating to put a pyrometer in the heating flame, and then estimate how much of the heat is absorbed, instead of trying the actual heat of the mixture.

Factor S deals with the error into which all compilers of exposure tables have fallen into in mixing up the quite independent factors of lighting and subject.

In practice, it is necessary to give a shorter exposure for white objects in which detail is required than for objects of average colour, and a longer exposure for dark-coloured objects; hence the need for a table of subject values.

The factor of distance affects the exposure; over distant objects the atmosphere adds reflected light to the image and shortens the exposure. In the case of very near objects the camera has to be racked out, and the exposure is increased. It is found convenient to draw up a scale of subject numbers for all coloured objects and varying distances, thus combining the last two factors.

A set of six prints from negatives of widely varying subjects, the exposures calculated by the new exposure-meter, and all developed together in one dish, were handed round by me. They varied in character from a cloud picture to a copy of a dark terra-cotta bust in a room.

My new exposure meter is a small, circular, brass box, having at one end the actinometer, at the other a chain pendulum for timing both actinometer and camera exposures, while round the circumference are four movable rings, each bearing a pointer for the factors A, P, S, and D; when these are moved opposite their correct values, a fifth pointer, E, gives the correct exposure.

The average time taken to test the light, and to find out the correct exposure, does not exceed thirty seconds. The approximate plate numbers for different makers of plates will be given in the instructions, but photographers are advised to make a test to ascertain for themselves what plate number gives a negative of the kind they require with the developer they are in the habit of using.

A rather subtle point is touched upon in axioms IV and V. More than one photometer is made based upon the idea that the quantity of light reflected from the object and reaching the plate is an exact guide to the exposure. This is quite a mistake, and three different pictures were thrown by me on the screen, one with a large quantity of white in it, another with a large quantity of black, and a third with an average amount; the part of the picture in each case which determined the proper exposure was a patch of dark detail, and the exposure for all three would be the same. Any photometer, however, estimating the light reflected from these subjects, would give different and misleading results. Again, if three different shades of grey paper be copied on three plates, with three exposures varying in inverse proportion to the quantity of light reflected from the papers, the three resulting negatives would be all of exactly the same intensity, which would not be the result required.

* Summary of a paper read before the Hereford Photographic Society.

Mr. W. I. Chadwick, who has been Hon. Sec. of the Manchester Photographic Society for fifteen years, is, we are informed, resigning his office.

Exeter Photographic Society. — President, Dr. Cheese; Vice-President, Major Dowdall; Hon. Sec., Rev. J. Sparshatt, of Fairfield College, Alphington Road, Exeter; Treasurer, Mr. Lake, High Street. Meetings, first Tuesday in each month. Next excursion, May 10th, to Silverton. Headquarters, the College Hall, South Street. Notices posted at Mr. Lake's. Visitors to Exeter requiring use of dark room are requested to write to secretary or treasurer.

Number 16 of the *Deutsche Photographen Zeitung* for the present year contains a notice of a memorial tablet of the late Herr J. B. Obernetter. The memorial has been executed at the cost of the German Photographic Union. Herr Obernetter died on the 13th April, 1887. The memorial is somewhat late, indeed, but yet better late than never. The principal movers in this affair are Herr Fr. Müller, Herr Werner, and Herr Zschokke. The memorial was presented by these gentlemen to the deceased's widow with a suitable verbal accompaniment in his praise. A laurel crown was also given on the same occasion by Herr Werner. The tablet bears the following inscription suitably displayed:—"To Herr J. B. Obernetter, Photographic Chemist, in grateful memory of his services in the furtherance of Photography, this memorial tablet is dedicated by the German Photographic Union, 1890."

THE LATENT PHOTOGRAPHIC IMAGE.*

BY C. H. BOTHAMLEY, I.I.C., F.C.S.

VERY contradictory statements have been made respecting the action of alkaline bromides. Many writers have stated that they destroy the latent image, whilst others assert that they merely retard development. I immersed exposed plates of various kinds in a 10 per cent. solution of potassium bromide for periods varying from five to twenty minutes. They were then thoroughly washed and developed. Potassium bromide does *not* destroy the latent image. Of course if the soluble bromide were not thoroughly washed out of the film, development might be retarded to such an extent that no image would appear until after a long time, and possibly this is the explanation of the erroneous statements referred to.

It follows, therefore, that the latent image is destroyed by halogenising agents, and also by potassium dichromate, even in complete absence of soluble haloid salts or of free acids. It is not destroyed by alkaline bromides, and apparently not by nitric acid, hydrobromic acid, or hydrochloric acid, but the effect of these substances, as well as of potassium iodide—which seems to prevent the production of a developed image without actually destroying the latent image—requires further investigation.† Ozone and hydrogen peroxide are also stated to destroy the latent image; but the published experiments are very meagre in details, and there is no evidence that any special precautions were taken to avoid secondary actions, or to eliminate the possible influence of minute traces of impurities. It is worthy of note that, according to Hodgkinson, silver chloride darkens readily when exposed to light in presence of hydrogen peroxide.‡ I am of opinion, therefore, that the action of these re-agents also requires further investigation; but until the chemistry of hydrogen peroxide and ozone is better understood, no very conclusive results are likely to be obtained from their effects on photographic plates.

In all previous experiments in this connection it is very doubtful whether sufficient attention has been paid to the possible influence of minute quantities of impurities. Probably in some cases all the re-agents or materials were pure in the usual sense of the term, but latterly chemists have been learning that substances which they commonly regard as pure still contain sufficient foreign matter to exert a most powerful influence on their behaviour, and in the particular investigations under discussion the very highest attainable degree of purity must be aimed at. The quantity of matter composing the latent image is very minute; hence the relative effect of minute quantites of foreign substances may be very considerable.

All the decisive evidence at present in our possession points to the fact that the formation of the latent photo-image is a process of photo-chemical reduction, the effect of which can be undone by treatment with halogenising agents, or with certain substances generally believed to exert an oxidising action.

About three years§ ago Carey Lea showed that latent images, capable of development and reversal in the same manner as the latent photo-image, can be obtained by treating sensitive films of silver salts with a solution of a hypophosphite, or an alkaline solution of grape sugar or milk sugar. Nitric acid and solutions of the haloid salts of the alkalies had the same effect as on latent photo-images. Carey Lea's experiments were made with the silver salts on paper. I have repeated them with ordinary gelatine plates with precisely similar results. The reducing agent (sodium hypophosphite or a solution of milk sugar made alkaline by caustic potash) when brushed on the plate, produces no visible effect; but a dense deposit can be developed. These latent images thus formed are destroyed by potassium dichromate, but not by dilute nitric acid or by alkaline bromides. Potassium iodide affects them in the same way as the latent photo-image. (Examples shown).

Latent images, capable of development, are also formed as a result of a shearing stress applied to the sensitive film. This was observed by Carey Lea* in the case of wet plates, but was first carefully investigated by Abney.† The effect is easily observed by writing on the surface of an ordinary plate with a clean glass rod, using moderate pressure, and then placing it in a developer. Abney found that the material of the rod used for writing has no influence on the result; the effect, if sufficient pressure is used, is transmitted through paper. Sensitive and less sensitive forms of silver bromide behave similarly; the latent image formed is destroyed by potassium dichromate; the effect is not so much on the surface on the film as lower down or near to the glass, for if the film is moistened, superficially melted, allowed to set and then developed, the sharpness of the image is scarcely affected; but if the film is completely melted the developed markings are blurred. He also was unable to observe anything of the nature of phosphorescence when the writing was done.

Several points in connection with these phenomena seemed worthy of further investigation. Details of the experiments I shall describe in another place. I found that with one and the same plate the effect gradually increases with the pressure, but that there is no connection, as might have been supposed, between the sensitiveness of the plates to light, and the minimum pressure required to produce a developable image upon them. (Examples shown.) At present, I have not been able to trace any connection between the minimum effective pressure and the hardness of the film. I confirmed Abney's statements that the material with which the writing or "shearing" is done is without influence on the result, provided that it is a sufficiently hard substance: that no phosphorescence can be observed when the film is scratched; and that the latent image is destroyed by potassium dichromate. I also examined the action of various other re-agents, such as bromine and potassium bromide and iodide, and found the results to be identical with those given by the photo-image. Independent confirmation of Abney's statement that the effect is greatest in the lower part of the film, was obtained by a method quite different from that which he used. After some plates had been subjected to various degrees of shearing stress, they were exposed to light for a very short time. One half of each plate was then dipped in a very dilute solution of potassium dichromate for a short time, washed, and developed. It was found that the superficial latent image produced by light

* Continued from page 304.

† I may add that I am engaged with experiments in this direction.

‡ *Photogrdphic News*. xxxi. 370.

§ *American Journal of Science*, 1887, and English photographic journals of the same year.

* *American Journal of Science* [2] xlii. 198.

† *Photographic Journal*, 1883 and 1881; *British Journal of Photography*, xxx. 418; xxxi. 167.

had been completely destroyed, whilst the deeper-seated effect of stress was only slightly affected.

Latent images, which behave in a precisely similar manner with various re-agents, and are therefore presumably of very similar, if not identical composition, can be produced in at least three ways:—(1) by the action of light; (2) by the action of chemical reducing agents in the dark; and (3) by shearing stress. The second mode of production is easily intelligible; the production of chemical change by shearing stress at first sight seems difficult to understand. The researches of Spring have shown, however, that many chemical changes in solid substances can be produced by the application of great pressure. As a rule, pressure promotes combination, but there are certain cases where a compound is decomposed when strongly compressed. According to Spring, if the volume of the compound is less than the sum of the volumes of its uncombined constituents, pressure tends to produce combination: if, on the other hand, the sum of the volumes of the uncombined constituents is less than the volume of the compound which they form, pressure will tend to decompose it. The effect of pressure on chemical changes is, in fact, strictly analogous to its effect on the melting point of solids. At present we do not know the relation between the space occupied by the materials of the latent image, and that occupied by the original gelatino-bromide. If the former is less than the latter, the formation of a latent image by stress is only a special example of Spring's second law, and the apparent difficulty disappears.*

(To be continued.)

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Comparison of Developers—Toning and Fixing Bath.

Comparison of Various Developers.—Much has been written of late in German periodicals about developers and developing, the question as to the best method of bringing out the latent picture, and to the most efficient reducing agent, seeming to interest at present more than ever. There is a German proverb, that a good thing cannot be told too often, and so I shall complete my previous communications by giving an abstract from a very interesting paper read before a small circle of Berlin professional photographers by Mr. F. Gaedicke, whose name is sufficiently well-known in the photographic world.

The four developers now most commonly in use—ferrous oxalate, pyro, hydroquinone, and eikonogen—were compared with each other, and the plates to be treated with the solutions were divided, for experiment, into three series; the first of them having received only one-fifth of the normal exposure, the second the normal exposure, and the third four times the normal exposure. Each series and each developer was treated under its most favourable conditions, so to the ferrous oxalate developer two drops of an accelerator consisting of hypo and potassium bromide were added; to the hydroquinone developer, four drops of a 40 per cent. potassium-lye; and the eikonogen developer was used as is recommended for instantaneous exposures, together with the preliminary bath consisting of hypo and bichloride of mercury. The plates were developed until a slight greyish appearance indicated the first signs of the approaching fog. The sensitometer consisted of one to sixteen layers of tissue-paper, and, as source of light, a flat gas-burner was used, which was turned down until there was no more roaring of the flame. The results of the experiments are shown by the following table:—

A. Under-exposed plates.—Exposure 1 second at a distance of 28 inches from the plate, *i.e.*, one-fifth of the normal exposure.

No.	Development.	The image appears within	Time of development	Sensitometer No.	Character of the image, and notes.
1	Ferrous-oxalate, with addition	9 seconds	5 minutes	14	Yellow fog; 1 and 2 are but slightly different.
2	Pyro-potash	12 ,,	3 ,,	14	Red fog.
3	Hydroquinone with potash	20 ,,	3 ,,	15	Clear.
4	Eikonogen with potash and preliminary bath	6 ,,	3 ,,	14	Yellow fog.

B. Normal-exposed plates.—Exposure 1 second at a distance of 12½ inches from the flame.

5	Ferrous-oxalate, plain	12 seconds	3 minutes	16	The negatives were all good and harmonious. By transparent light, the pyro-negative was brownish-black, the others bluish-black, therefore of better printing quality. The iron negative was the least clear one.
6	Pyro-potash	8 ,,	2¾ ,,	16	
7	Hydroquinone	25 ,,	3½ ,,	16	
8	Eikonogen-soda	12 ,,	3 ,,	16	

C. Over-exposed plates.—Exposure 4 seconds at a distance of 12½ inches from the flame, *i.e.*, four times the normal exposure.

9	Ferrous-oxalate, with 4 drops potass. brom., 1 : 10	18 seconds	3½ minutes	16	1 to 8 but little graduated; flat and useless.
10	Pyro-potash, with 8 drops pot. brom.	20 ,,	2½ ,,	16	Better graduated than No. 9; a little too hard, but usable.
11	Hydroquinone, only old solution, with 8 drops potass. brom.	60 ,,	5 ,,	16	Normal negative, the best of this series.
12	Eikonogen-soda, with 8 drops potass. brom.	30 ,,	3½ ,,	16	Flat and useless.

All the developing solutions, of which, in all cases, 40 c.c. were taken, had been allowed to stand for 24 hours after the preparation, because pyro acts much more energetically if freshly prepared, but always older solutions are to be taken into consideration. To the *ferrous-oxalate developer*, in the case of the under-exposed plates, 2 drops of a

* I gave this explanation of the effect of shearing stress in a lecture before the Leeds Photographic Society early in 1888, but did not publish it. Professor Meldola refers to Spring's researches in the same connection, but less specifically, in his "Chemistry of Photography," p. 192.

solution of 1 gramme of hypo and 6 grammes of potassium bromide in 60 c.c. of water were added; in the case of the over-exposed plates, 4 drops of potassium bromide, 1 : 10; in the case of normal exposures no addition was made. In the case of *hydroquinone development*, 20 c.c. of an old solution, 20 c.c. of a fresh one, and 4 drops of a 40 per cent. potassium-lye were used for the under-exposed plates; for the normal exposures, two-thirds of an old solution, one-third of a fresh one, and 4 drops of the potassium lye; for the over-exposed plates only old developer, with 8 drops of potassium bromide, 1 : 10. In the case of *eikonogen development*, the preparation with potash and with the preliminary bath (hypo and bichloride of mercury) was used for the under-exposed plates, the preparation with soda in two solutions for the normal exposed plates, and the same preparation, with 8 drops of potassium bromide, 1 : 10, for the over-exposed plates.

As the table shows, all the developers gave good results in the case of normal exposure; but as normal exposures in practice do not form the rule, but, on the contrary, the exception, the results of over and under exposure are more important. For over-exposure the eikonogen developer was the worst, hydroquinone the best. In the case of under-exposure only the hydroquinone developer gave a clear negative; all the others were yellow or red fogged, and inferior for one sensitometer number. It follows therefrom that the hydroquinone developer is decidedly the best one, as it is also the cheapest one, because in most cases an old solution may be used. Pyro solution does not keep well, and it is necessary to work with separate solutions. Also eikonogen solutions do not keep as well as hydroquinone solutions, and are liable to fog the plates after a few days. In all, the results are the following:—1. Ferrous oxalate. Good, bluish-black negatives, which, however, if no preliminary bath is used, are harder than those obtained with the alkaline developers. The developer is very poisonous. For the case of heavy over-exposures it is little suitable. 2. *Pyro-potash developer.* The most energetic developer; gives a good, soft, brownish-black negative. Two separate solutions. In the case of over-exposures it may be used with potassium bromide. The negatives dry more readily than all others. 3. *Hydroquinone.* The image appears later than with the other developers, but it is developed out in the same time. The negative is mostly denser than with pyro and eikonogen. It is bluish-black, and prints well. If the solution is cold, it develops very slowly; it should therefore have an average temperature. 4. *Eikonogen.* In the beginning it develops quickest, but in order to obtain vigour, it requires as much time as iron and hydroquinone. The keeping qualites of the mixed solutions are very doubtful, and even with the separated solutions fog sets in after a short time. The developer is about five times as dear as the others. In the case of over-exposure it is less useful than pyro and hydroquinone. It is a great disadvantage that the eikonogen is highly sensitive to the influence of ammonia. The final result of these experiments is therefore: *that at present the hydroquinone developer is to be preferred to all others as decidedly the best one.*

The Best Combined Toning and Fixing Bath for Gelatino-Chloride Paper.—Mr. R. E. Liesegang, a young, but very serious investigator, has made careful experiments in order to find out the most efficient combined toning and fixing bath for prints on gelatino-chloride paper. He recommends the following one:—

Solution No. 1.

Hyposulphite of soda	200	grammes
Alum	80	,,
Nitrate of lead (pulverised)... ...	2	,,
Boiling water	400	c.c.

The solution is allowed to stand for two days; then once more 400 c.c. of boiling water are added, and the solution is filtered. Meantime, the following solution is prepared in a bottle:—

Solution No. 2.

Sulphocyanide of ammonia	160	grammes
Water	1,200	c.c.

Solution No. 1 is mixed with solution No. 2, and then added:—

Solution of gold chloride (1 per cent.) 10 to 20 c.c.

With this bath the prints take any desired tone within three to five minutes.

BOTANICAL PHOTOGRAPHY.

BY JULIUS F. SACHSE.

The first three months of the year are in this latitude generally supposed to be the least favourable for the amateur photographer, and the exercise of his hobby. The fields and pastures are black; hillsides and ravines, so inviting in summer, are now bleak and desolate; and the trees, under whose grateful shade we rested during our summer outings, are now leafless and bare. Christmas-tide, with its joys, is past and gone; the various Christmas trees, with their gaudy dressings, our presents, groups, and visitors, have been "taken" by Blitz or Sun, and most amateurs count their winter's work completed. Some enthusiastic votaries have kept their practice alive by copying pictures, old documents, maps, seals, or objects of vertu or antiquity, and other subjects, not forgetting sundry interiors. Still, as such work partakes more of the dull routine of labour than pleasure, the interest in photography has naturally more or less flagged, while the amateur sets aside his outfit until spring shall come, when he can again strike out in pastures new, and find food for his camera.

To the "photographic studiosis," as a German contemporary designates the enthusiastic amateur, there is no need of waiting until the country is again clothed in pristine verdure. Our suggestions will apply to the whole guild of camera carriers.

There are but few persons, if we except the arborist, who have any idea of the difference existing in tree structure, or the diversity in shape and growth of the limbs of the various species.

Nothing will surprise the intelligent observer more than the marked difference between our common trees, which we have known since childhood, without taking special notice of their peculiarities, as can be seen by a comparison of eight or ten photographs of as many different varieties, the negatives being made at the present season, while the subject is bare and leafless.

The wide divergence in characteristics of growth, such as shape and bark, as shown by such comparison, will prove a revelation to many a well-informed person, and opens a wide and interesting field to the amateur photographer and student.

In our suggestion of this study we would advise a selection of marked, well-grown specimens, that can be taken on the plate so as to preserve all the features of the

tree without being secondary to any surroundings. It makes no matter whether the subject be a monarch of our primitive forest, or some favorite specimen of ornamental growth, introduced from foreign climes; each individual variety has its peculiar characteristics. Photograph the tree in a strong light, so as to bring out the detail of the surface. It would be well to carefully note the distance from the butt of the tree, or the point of the compass, if there is no other way of locating the spot where the tripod was set; this note is for reference in the future, so that after the spring has opened, and the trees are once more clad in their verdure, another trip can be made to the same spot, and a plate made of the same tree in its glory. This study can be further supplemented by photographing the tree while the buds are bursting, when the leaves are out, and then again in the fall, when the leaves are either in their autumn glory or after they are brown and falling, using orthochromatic plates; further, if the above suggestion be carried out, after the leaves have again fallen, a fifth plate can be taken of the same subject, and then compared with the first plate; it will show the marked changes and growth which have taken place within the year, and which are not perceptible to the eye.

It will be seen that for these comparative plates to be of value great care should be taken to set the camera at the same point for the different exposures.

To any amateur having a taste for such research and experiment, we would point out the interesting groups of flowering trees, where not alone the tree structure, but the flowers, the leaves, and the fruit all tend to form an interesting group of subjects for the camera.

Take, for instance, the common Horse Chestnut (*Æsculus Hippocastanum*), a large symmetrical tree. In a photograph taken at the present time, we would have the structure or framework of the tree; the next plate we would suggest when the tree is in blossom, covered with a wealth of erect spikes or panicles of flowers, which stand out in bold contrast with the bright green foliage; then for a third plate, the same subject after the fruit is well formed, and the foliage has reached its fullest development.

Any one who takes up the study of this subject will also find the bursting leaf-bud, the young leaf, the flowers separate and in panicle, the developed leaf, the green fruit burr, as well as the burr when opened by the frost, exposing the ripened fruit, all picturesque subjects for the camera.* A series of photographic studies of this kind, carefully executed, would form an album far more interesting and instructive than the ordinary view or portrit album, so common and so listlessly gone over by the visitor to whom it is shown, and who, for politeness' sake, goes over page after page without noticing what the pictures represent.

In the same group of trees with the example mentioned, we would call attention to the Catalpa (*C. Syringæfolia*), with its large, heart-shaped leaves, and large pyramidal clusters, a foot long, of white and purple flowers; the Paulownia (*P. Imperialis*), a magnificent tropical looking tree, with leaves twelve to fifteen inches in diameter, and large clusters of lilac flowers; the magnificent native "Tulip Poplar," so called (*Liriodendron Tulipifera*), with its erect growth, broad, glossy, fiddle-shaped leaves, and beautiful tulip-shaped flowers and curious seed-pods; not forgetting the Magnolias, Conspicua, Acuminata, but especially the "Macrophylla," or large-leaved, with leaves two feet in length, and a profusion of dull white flowers, of the size of a man's hat. These specimens will suffice for one group.

Then we have the various native forest trees, such as the Oak (*Quercus*), the Maples (*Acer*), Ash (*Fraxinus*), Locust (*Robinia*), Elm (*Ulmus*), Linden (*Tilia*), Poplar (*Populus*), Gum (*Liquidamber Styraciflua*), and many others, all having characteristics which may be plainly shown with the camera.

The various fruit trees, Cherry, Peach, Plum, and Apple, all form beautiful subjects. In connection with this group of subjects, we will state that on one occasion when we asked a gentleman, who has one of the largest collections of lantern slides in the country, the question, which he considered the finest slide in his collection, he unhesitatingly answered, "An apple tree in full blossom." He further volunteered the information that he had eight slides of this subject made from as many different negatives.

Our field of study can be extended to the large family of flowering shrubs, or minor trees, as the Dogwood (*Cornus*); the weeping trees, as the Ash, Beech, Birch (*Pendula*), &c., the Rose of Sharon (*Hibiscus Syriacus*), Hydrangea (*H. Paniculata Grandiflora*), Lilac (*Syringia*), Purple Fringe (*Rhus Cotinus*), and many others.

It will be seen by reference to above list (although not a hundredth part of what we might have made it) how great this field is for study and development, and well worthy of the attention of all intelligent amateurs, especially the lady votaries of our art; and this independent from the fact that it would be the means of leading many persons to a closer study of the secrets and beauty of nature.

At the same time we cannot refrain from cautioning the neophyte, if he wishes to take up this study as above suggested, from attempting too much at the start; it is better to complete two or three sets thoroughly and correct, than undertake a dozen or more subjects, and complete none.

The plan pursued by the writer is first to select the specimen tree; then after a satisfactory position for the camera has been obtained, plumb the camera with a plumb-line, the same as a surveyor's level, then drive a large peg directly under the centre,—this securely marks the location for any subsequent exposures—then level the camera, pointing as near the centre of the tree as possible; the centre can also be marked by tacking a small piece of white fabric on the tree on a level with the lens.

A matter of value, in connection with the subject of photographing leafless trees, is the preservation of the outlines of historic trees—once landmarks in the history of our country or of its progress—guide posts, which are getting less and less every year, as they succumb to the ravages of time, or fall prey to the rapacity of man. As yet there is still a number of such trees throughout this country, and the searching out and tracing the traditions clinging to these silent monitors by the road-side, or as they stand alone in the field like a grim sentinel, will be found an enjoyable divertisement.

I should be pleased to receive and note any results from our readers who may take up this special line of photographic study, as outlined in above suggestions.—*American Journal of Photography.*

* The leaves, buds, flowers, and other detail are pinned against a white or neutral tint background, and focussed on the plate as large as possible without crowding the plate.

PHOTO-MECHANICAL PRINTING.

It has long been a hobby of ours to speculate on and wish for the coming of the "good time" when the making of the negative and the production of prints therefrom shall be divorced from each other, as much as at the present time are the work of the engraver and the plate printer. We say advisedly "the good time," as we fully believe it will be equally good for the photographer, the public, and true art itself.

Silver printing has served its purpose, and done more than anything else in connection with the art to bring about the great popularity which it has enjoyed during the last thirty years. It came at a time when art culture was at a low ebb, at least amongst the great mass of the people; and by its beauty and delicacy of detail fascinated, where breadth and true artistic effect would have fallen flat and remained unheeded.

Now, however, there is a gradually increasing evidence of a higher degree of art culture, and a daily increasing appreciation of the more truly artistic qualities of several at least of the numerous processes of mechanical printing, some of which have been already brought to a high degree of perfection.

The "good time coming," and which we hope will come soon, will be one in which the photographer will be relieved from all the drudgery and cost of printing, and the constant worry incident to blisters, tears, mealiness, and the thousand-and-one cares and troubles of the printing and finishing departments; and, free to give his whole heart to the production of the negative, with the handing over thereof to the sitter, and the receiving of a handsome fee therefore, his responsibility will end.

The sitter, in possession of a negative, will, on examining the results of the various mechanical processes, select that which pleases him best, or is most suitable for some special purpose, and hand it to the printer with an order for such a number of copies as he may require. It is true that the processes suitable for this kind of work are, as yet, too expensive; but those who have watched the development of mechanical printing, from Talbot's earliest efforts through all its various stages to, say, the "tree study" by Ives' process in the March number of the *American Journal of Photography*, or the prints in the Gutekunst souvenir noticed in our last issue, cannot doubt but that something equally good and suitably cheap is but a matter of time, and in the near future.

Of course, we are quite prepared to hear the "craft in danger" cry. No new development or great improvement in mechanical process has escaped that. When it was proposed to supersede stage coaches by railroads, it was declared that horses and men would both find their occupation gone, but the railroads employ hundreds of both, where tens only were required. In the town in which our early years were spent, we remember, when it was proposed to substitute power for handloom weaving, that five hundred weavers saw nothing but starvation or the poor-house before them; and yet, within a very short time after their introduction, they gave constant and better paid employment to fully five thousand hands; and so it has always been; wherever a suitable division of labour has been made and suitable machinery introduced, the result has been a large increase in the numbers employed, and better payment for the work.

We have said that the change would benefit the photographer, the photographed, and art itself. It would benefit the photographer by enabling him to give his undivided attention to the production of the negative, and by saving the expense of a staff of assistants and the heavy outlay for stock, &c. Like his brother artists of the brush and modelling tool, his work would be done by his own hands, and imbued with his own individuality, and would be paid for in at least something like a relation to its artistic value. The picture-loving public—not the mere photograph-loving, but the *picture*-loving public—of the near future will be able to appreciate the difference between negatives that are the outcome of genius, either inborn or acquired, and the work of those who do not possess the one and are too lazy to study till they obtain the other, and the latter will deservedly go to the wall.

If the photographer, with no wages to pay and no stock to buy, who makes even half-a-dozen negatives a day and gets a minimum price of five dollars for each, does not think he will be better off then than now, he need not read any farther, as this is not written for him, but for his more reasonable brethren.

Then, as for the general public, the patrons of the photographer, the "good time coming" will benefit it by enabling it to secure pictures impressed by the style and individuality of those whom it most admires, and printed in style and colour according to its fancy, and with the assurance that such prints shall be as permanent as the paper on which they are made. Nor need they be confined to one particular style. From the one negative they may have made, at so much an inch, photogravure plates, tye-printing blocks, &c., to be kept on hand for such purposes as may from time to time be required.

Nor will true art itself be less a gainer by the change. An educated and cultured public will cease to regard a photograph as an article of manufacture, like a pair of boots or a spring overcoat, and worth only a tradesman's profit over the cost of material and labour; but will look upon the negative as a valuable family possession, the outcome of a combination of artistic ability and technical skill of their favourite artist photographers.

Under such circumstances it must be that certain men will make their mark as head and shoulders above their fellows, and although we may not live to see it, we believe the time will come when their productions will increase in value like the works of the old masters, or the fiddles of the Cremona makers, and, like the "Strades" and "Amaties," be worth much more than their weight in gold.

Photographic Club.—Subject for discussion on April 30th, "The Development of Unknown Exposures"; May 7th, "Lenses for Instantaneous Work." Saturday outing, April 26th, Buckhurst Hill; train from Liverpool Street at 2.8.

Anhydrous Sulphite of Potassium.—The crystalline sulphite of potassium ($K_2SO_3.7H_2O$) contains seven molecules of water, and is rapidly altered on exposure to air, losing water, and becoming gradually oxidized to sulphate of potassium. The well-known firm of Kahlbaum (Berlin) now puts the salt on the market in an anhydrous condition. In this form it is perfectly stable. It would be of advantage to have sulphite of sodium in the same anhydrous form.—*American Druggist.*

Clearing Collodion.—A correspondent of the *Druggists' Bulletin* says that a transparent collodion is in use in Paris which is not only perfectly clear, but remains limpid for an indefinite time. It is prepared by shaking an officinal collodion with quartz sand which has previously been washed and carefully calcined. The action is purely mechanical, the suspended particles adhering to the grains of sand, and settling to the bottom of the container in a gelatinous mass.

Correspondence.

THE PROPOSED ILFORD SCHOLARSHIP.

Sir,—I am sure you will join with me in deploring the conclusion reached in this matter, as shown in subjoined letters, and will allow me to say, through your next issue, that I can only look forward with hope to the good time to come when we shall have more cohesion between the various societies, more unanimity of purpose in the endeavour to add to the dignity of photography, and less airing of presumed personal grievances and idiosynerasies. Then the amateur and professional, as such, will exist no longer, but all will be photographers without any invidious distinction, other than merit, and all will form a race, by training and education, infinitely superior to their fellows of to-day. The Britannia Works Company hoped that their offer of a scholarship would have been the foundation stone of such a Utopia; but it seems we are ahead of our times; no one seems equal to the task of laying that foundation stone aright.

When any society or committee of leading men see their way to fitly use the gift, it will be ready for them.

John Howson.

Britannia Works Company, Ilford, E., April 21st.

Dear Sir,—With reference to your letter of the 29th ult., I am directed by the Council of this Society to send you a copy of the following resolution which, was passed yesterday evening:—"That the Council of the Photographic Society of Great Britain, while thanking the Britannia Works Company for their offer, regret that, after the due consideration, they are unable to accept it."

Photographic Society of Great Britain. A. M. Mantell, *Sec.*

To J. Howson, Esq., Ilford.

Dear Sir,—I thank you for your letter of yesterday, and share the regret of the Committee at the non-acceptance of the proposed scholarship. If I may be permitted to express an opinion on the matter, I feel that there is a great want of due regard to the interests of photography when a free and absolutely unfettered gift of £100 per annum to benefit the art science cannot find a recipient. John Howson.

To Captain Mantell, Secretary P.S.G.B.

DEVELOPMENT IN TWO SOLUTIONS.

Sir,—At page 152 of the last Year-Book of Photography is an interesting article, by B. J. Edwards, on "Development." This article, however, contains one small paragraph which might be expressed more clearly, and I venture to hope that he will publish his exact meaning for the benefit of amateurs anxious to learn. I refer to the last paragraph but one, on page 154, beginning, "It will be obvious," &c.

Would Mr. Edwards kindly explain what he means by a "similar solution," and how in particular would he recommend "Beach's Developer" to be used so as to carry out the same principle?

Beach's Two-Solution Developer.

	No. 1.	
Water	2 ounces	1 ounce = 437½ grs.
Sulphurous acid ...	2 ,,	
Sodium sulphite ...	2 ,,	
Pyro	218 grains	
	No. 2.	
Carbonate of potash	3 ounces	
Sodium sulphite ...	2 ,,	
Water	7 ,,	

The above solutions are recommended to be used for normal exposures, thus:—Soak the plate for one minute in a mixture of 30 minims of No. 1 with 2 ounces of water. Pour off the mixture, add 40 minims of No. 2, and continue development.

How should the "second developer or intensifier" be made? Does the "full dose of pyro" mean that mentioned at top of page 154, viz., 16 grains to the ounce? How much ammonium bromide or potassium bromide to the ounce, and what increase (if any) of carbonate of potash to the ounce? X.

THE CRYSTAL PALACE CHALLENGE CUP COMPETITION.

Sir,—We should think that your readers will be with us in feeling very much surprised at the trifling evasions of the Crystal Palace Executive. It is usually considered that in disputes there are two sides to a question, but here we have apparently an exception to this rule. Spite of the amount of reputation which the management must know they have at stake in this matter, they have never from the beginning of the correspondence replied *with proof* to any one of our charges.

They say in their last communication that they "deny unequivocally the allegations," and "that the Company is in a position to prove that such allegations have absolutely no foundation in fact." Then their course is clear: *let them bring forward this proof*, and we shall feel satisfied. This is what we have all along fruitlessly asked for.

At the same time we are anxious to know what they will prove. Our last letter is *not* an allegation, but a string of plain facts, laid before your readers with no unnecessary comment.

Perhaps they will prove that we sent no pictures at all. Will they deny that we wrote asking them to lay aside the four pictures which they—but not their rules—objected to? Will they deny the letter from one of their own judges, stating that only part of our pictures were judged? Will they deny their own letters accepting our pictures as in form? These are our "*allegations*," and unless Messrs. Wollaston and Peasgood are prepared to bring forward some of this *proof* which they profess to have, it is useless to reply further to their present valueless statements.

Auty & Ruddock,	W. Parry,
T. Galloway,	J. Pike,
J. P. Gibson,	H. R. Proctor,
J. E. Goold,	H. G. Ridgway,
Edgar G. Lee,	Lyd. Sawyer.

Mosley Street Café, Newcastle-on-Tyne, April 21st, 1890.

Patent Intelligence.

Applications for Letters Patent.

5,613. C. Guttmann, 21, Cornhill, London, "Developing-Room Lamp."—April 14th.

5,681. C. R. Shill, 67, Oakhurst Grove, East Dulwich Green, "Portable Frames and Suspenders for Mounting and Suspending Pictures."—April 15th.

5,742. E. Fairweather, 218, Devonshire Road, Forest Hill, London, "Developing Photographs."—April 16th.

5,815. S. Raudnitz, 82, Chancery Lane, London, "Substitute for Glass."—April 17th.

5,860. Harry Ransom, 4, South Street, Finsbury, London, "Cameras."—April 17th.

5,863. A. S. L. Abraham, 34, Southampton Buildings, London, "Photographic Shutters."—April 17th.

Specifications Published.

7,071.—*April 27th*, 1889. "Spreading Gum, Paste, and like Liquids, and Stoppering the Bottles containing such Liquids." Adolph Buhler, Reichenhall, Bavaria, late Captain in the Bavarian Army.

My invention relates to an improved device for enabling gum, paste, and similar liquids to be evenly spread, the said device serving also the purpose of an efficient stopper for the bottles containing such liquids.

It is well known that when spreading gum or similar liquids by the use of a brush in the ordinary manner, the brush at first usually contains too much of the liquid, and therefore lays it on too thickly and uneveuly, and if the brush be wiped against the bottle neck to free it from a superfluity of liquid, the cork of the bottle is liable to stick fast in the neck thereof. To avoid the latter difficulty, loose covers, such as metallic capsules, are used, which have the objection that the liquid in the bottle, through exposure to the air, thickens in a very short time. Even the recently proposed elastic gum bottles which terminate in a slit conical tube, and which are used directly for spreading the gum by giving the bottles a slight pressure, do

not well answer the purpose, as the gum soon hardens at the outlet and clogs it up.

By my invention the hereinbefore described objections are overcome.

My improved device comprises a tube which is so fitted in the corks of the bottle that it can be easily removed therefrom and replaced.

The tube is advantageously of cylindrical form, pointed at its lower end, where it is provided with several small perforations. The tube is preferably fitted with a collar at the upper end, in order to prevent the point from coming into contact with the bottom of the bottle.

The upper end of the tube, which is open, has an india-rubber cap which serves, firstly, to suck a quantity of the liquid into the tube; and secondly, when softly pressed, to cause the liquid to issue through the perforations in the tube and become evenly and slowly spread.

Instead of employing an india-rubber cap the tube may be constructed with a piston similarly to a syringe, or the tube itself may be made in the shape of a plunging-syphon. As the hole in the cork is made to just fit the tube, all the gum which may be on the outside of the tube is removed by the cork when drawing the tube out for use. The tube can, however, be fastened to the cork, and as it is not necessary to scrape or wipe the tube against the bottle neck, the cork will not be liable to stick.

After the tube has been used for spreading the liquid, it is pushed down again through the cork into the bottle, until the collar rests tightly on the cork, thus forming a secure stopper and preventing the drying up and thickening of the liquid. If the india-rubber cap of the tube, when pushing the latter back into the bottle, be compressed by the fingers, the liquid will enter the tube as soon as the pressure of the fingers is removed, and the tube will thus be always ready for use.

Instead of using the conical point of the tube for spreading the liquid, this may be more evenly affected by adapting special spreading devices to the latter, such as a brush, a piece of elastic attached to a spring wire, a piece of sponge or a rubber roller, it being necessary for this purpose to somewhat modify the shape of the end of the tube.

7,759. *May 9th*, 1889.—"A Combined Umbrella Walking-Stick." Gwendoline Peyman, South Bank, Milverton, Leamington, Warwickshire.

We print this patent because umbrella walking-stick camera stands have been found useful in photography. The inventor says:—

This invention consists in combining an umbrella with a walking-stick in such a manner that the combined article can be used for an umbrella or for a walking-stick.

In carrying out my invention, in some cases I form the umbrella on a tube, such umbrella-tube sliding over a tubular or solid core.

I form the walking-stick hollow, and place the umbrella and core inside the walking-stick in such a manner that the walking-stick can be used for ordinary purposes.

When I wish to use the umbrella, I push the sliding tube and umbrella out at the end of the walking-stick until the umbrella shade is entirely outside the walking-stick; I then draw back the umbrella tube over its core, and push the walking-stick concentrically up or inside the shade, and expand the said shade over the extreme end of the walking-stick, and then use the walking-stick as a handle for the expanded shade or umbrella.

The hollow walking-stick must be of a suitable transverse section to receive a collapsed umbrella; the umbrella would, of course, be made of the thinnest material so as to collapse into the smallest possible dimensions.

8,603. *23rd May*, 1889.—"The Production of Phototypes." Johannes Adalbert Fischer, Merchant, Leipzig, Saxony.

In the art of printing, the usual method of producing images in imitation of photographs has been to print the images on specially prepared sheets—chalk or chromo-paper sheets—the said sheets being prepared with a suitable mass on their entire surface, which could only be done at considerable cost. On the other hand, in attempting to transfer the images on ordinary printing paper, there arose the difficulty that, owing to the absence of the so-called chalk base, the sheets could not be sufficiently polished or glossed to obtain the desired effect.

In order to simplify and cheapen the said printing process, I proceed as follows:—Any ordinary printing paper is coated with a suitable ground glass—or the latter is pressed on—but only within the outline of the images, after which the images are printed, and then the surface is polished or glossed.

The images or phototypes thus produced are similar to photographs or heliotypes, but can be produced more cheaply than those which were made by preparing the entire surface of the paper.

The inventor claims:—

An improvement in the production of phototypes, which consists in providing the paper with a base of a suitably prepared mass within the outlines of the images only, then printing the image, and subsequently polishing or glossing the surface by a polishing or glossing machine.

2,776. *February 20th*, 1890.—"Photographic Lens Shutters." Frank Bishop, of the firm of Marion and Co., 22 and 23, Soho Square, London, Dealers in Photographic Materials. A communication to him from abroad by the firm of Voigtländer and Son, of Brunswick, Germany.

The inventor claims:—

1. In a photographic lens shutter composed of segments or plates pivoted to an annular frame, and simultaneously moved about their pivots, the construction of the said plates of such form as to open or separate from each other at the centre, and at practically the same instant or immediately afterwards, in the direction of the circumference in the form of curvilinear, ray-like extensions of the central aperture.

2. The combination, with the herein-described shutter, and its spring-actuated crank motion provided with a shouldered discs, of the spring-actuated detent adapted to engage with either shoulder of the said disc, and arrest the shutter in either of two positions for the purpose specified.

3. The combination, with the herein-described shutter, and its spring-actuated crank motion, of the spring-actuated detent adapted to engage with the spring motor, and arrest the shutter in either of two positions, and of the trigger lever provided with an adjustable escapement piece adapted to act on the detent, and disengage it from the spring motor with whichever shoulder it may be in engagement, and capable of being so set as to keep the detent out of engagement with the spring motor during the whole motion of the shutter, or allow the detent to immediately fall back into engagement with the spring motor, so as to arrest the shutter when it reaches the fully-open position.

4. In the herein-described shutter-actuating and releasing mechanism, the combination, with the trigger and escapement piece, of the cam or eccentric for adjusting said escapement piece in either of its two positions.

2,781. *February 21st*, 1890.—"Cramp for Glueing Picture Frames." George Ott, of Ulm, on the Danube, Germany, Manufacturer.

This invention is a device intended to facilitate the glueing of frames for pictures and such like, and the compression of mitred quoins.

The inventor claims a mitre cramp for picture frames or the like consisting of a frame with an open space furnished with rabbets, a slide provided with two movable cheeks having dents arranged at an angle of forty-five degrees, a spring, screw, cheeks, for the purpose of joining quoins of bands or frame bars to be glued or otherwise secured together, the whole combined and operating substantially as set forth in the specification.

Camera Club Notices.—Saturday, April 26th, first excursion of the season, Nutfield—leader, Rev. C. F. Fison; Thursday, May 1st, 8 p.m., Captain Abney will read a paper—subject to be announced later; Monday, May 5th, 8 p.m., opening of exhibition of Mrs. Cameron's photographs; Monday, May 5th, 8.30 p.m., smoking concert—last of the season.

Proceedings of Societies.

Camera Club.

Thursday April 17th; Mr. A. Stroh in the chair.

A *lue noir* on "Amateur and Professional Photographers," by Mr. W. Adcock, was read by the Secretary in consequence of the absence of the author through illness. In the paper Mr. Adcock stated that he was dealing with a delicate subject. He was an amateur himself, and he had never received a penny for anything he had done in photography. Amateur photography was said to reduce the trade of the professional worker; also to exercise an influence adverse to him by conveying an idea to the public of the low cost to him of the articles he produces; it was likewise said that amateurs injured him by giving photographs for sale for charitable purposes. It was said that these influences, in addition to the rent, rates, taxes, and wages which the professional photographer had to pay, had rendered it difficult for him at the present time to keep a special staff for special work. His (Mr. Adcock's) sympathies in this matter were with the trader, whose difficulties he believed to be increasing year by year. As to the charge of injuring private trade by giving prints for sale at bazaars in aid of charities, the end seemed to justify the means. In such cases he employed a trader to produce from his negatives all the prints he required for the purpose. He thought that amateur photographers should buy as many photographs from traders as if they had never taken up the subject. He also thought that when the friends of an amateur wanted prints from negatives he had taken of them, the amateur should give the negatives out to a trader and let him supply, on reasonable fixed terms, whatever prints might be required. Amateurs should try to give professionals all the support they could, and obey the golden rule of doing unto others as they wished others to do unto them.

Mr. Pringle and Mr. Webber expressed approval of much that had been said by the author of the paper, after which the discussion drifted into the minor question of the separation of amateurs and professionals at competitive exhibitions; a vote was taken on the point, and the meeting was unanimous in the opinion that no such separation should be made.

The Chairman held that if any injury were done by the amateur to the professional, it was very slight, and in portraiture, the most profitable branch of photography, the professional has every advantage, for he has a studio and means of lighting such as an amateur never dreams of possessing. He himself had been started in amateur photography by a professional. He was at the seaside at the time, and went to get his portrait taken. In time the prints were sent to his hotel, and when he looked at them he could not recognise himself in the least; it looked like a portrait of the Prince of Wales, and he had been given somewhat of a Roman nose; all his friends laughed at the picture. He went to the photographer and asked him what he meant. This time he saw the proprietor, who said, "Oh! I suppose you want a likeness. If so, you must give me another sitting." He then sat again, and the result was worse than before; consequently, when he returned to town he thought that he would try what he could do himself, so he bought a little apparatus and started as an amateur. He did not think that he had ever done any harm to a professional photographer, and he did not believe that amateurs as a class did any harm to professionals. He thought that were it not for amateurs, photography would not be at its present state of perfection. If they slightly injured those of the professionals who turned out inferior work, where would be the manufacturers of apparatus and photographic goods were there no amateurs? Altogether, he thought that they did the photographic industry more good than harm.

London and Provincial Photographic Association.

At the meeting on the 17th inst., Mr. C. H. Cooke occupied the chair.

A question was asked in reference to the price of aluminium.

Mr. A. Haddon said that at a previous meeting he stated that he believed it could be bought at about 6s. per lb.; this price, he had since ascertained, was below its present market value. In ingot it could be bought for 15s.

Mr. T. E. Freshwater, referring to the permanency of silver prints, said he had recently opened a tin case received from Naples in which some silver prints had been packed since 1880; the image had quite faded.

Mr. W. E. Debenham said he had a batch of silver prints that had been lying by since 1882; they had been kept flat, but up to the present time they showed no trace whatever of fading except that the paper had turned a little yellow.

Mr. J. S. Teape showed a changing bag which could be easily made. It consisted of two thicknesses of black satteen cloth folded and sewn; the ends were left open, through which the hands were inserted, the changing being done entirely by feeling. He had used it frequently in the field for changing plates, and had found it perfectly safe.

Mr. W. E. Debenham had used a similar bag for changing plates out of doors. To insure the plates being put into the dark slides film side down, he attached a small strip of gummed paper to the back and over-lapping one of the sides of each plate; when putting the plate into the slide this strip of paper was torn off.

Mr. Everett suggested backing the plate. The rough side would be a guide in changing entirely by the feel, and would also act as a protection.

Mr. T. E. Freshwater showed several bromide prints of sunset pictures. The negatives were taken on Easter Monday at six o'clock in the evening. In exposing, the cap was taken quickly off and on the lens, using *f*/22 stop. He also showed some prints from negatives of the landslip at Walton-on-the-Naze. Referring to the newspaper reports of this matter, Mr. Freshwater drew attention to Burnt House Farm shown in one of the pictures as still standing, whereas the reports stated that this place had been destroyed by the catastrophe.

The Chairman asked whether paper packed between plates would be likely to cause abrasion of film.

Mr. Debenham thought not, unless a great weight was put upon them.

Mr. A. Cowan said that this method of packing had advantages over the paper clips at the edges of plates; packed in the latter way plates were more easily broken.

Mr. J. S. Teape said that in grooved boxes it was sometimes very difficult to get the side plates out of the box; to obviate this he simply cut the corners off the box.

Mr. Drage said that when in New York he bought some plates which were packed with a strip of cardboard at the edges; when developed the film that had been in contact with the cardboard was found to be full of holes.

Mr. A. Haddon remarked that at the last meeting a lantern-slide cover-glass, showing a deposit, was exhibited by Mr. York, but as the crystals were rubbed off before passing round, the members had no opportunity of examining it. He showed two glass globes blown by him some time ago; on the inside of each an arborescent growth had commenced. Mr. Haddon said that he had found this growth sometimes commence within twenty-four hours, but only with soda-glass. He remarked on the absence of any crystalline formation in incandescent lamps. From this he inferred that a certain amount of moisture must be present to form the deposit. In the case of the globes passed round, this would be supplied by the breath in blowing them.

Derby Photographic Society.

The monthly meeting was held in its Rooms, Derwent Street, on Thursday, the 17th inst.; Mr. Thomas Scotton presided.

Mr. R. Keene read a paper, in the course of which he said that he had no new theories to propound, no new cranks in development, as we were so well provided with photographic literature that everything new was published as soon as it left the hands of the inventor; but he would give a short sketch of the troubles and trials of a photographer who practised the art some thirty or forty years ago. He dwelt upon the trouble and time of cleaning and coating glass, and keeping in order the silver bath, as compared with the dry plate process. He exhibited a 15 by 15 camera of some twenty years or so

back, and compared it with the beautifully made instruments now in use, stating that a kit of that period would weigh about three cwt., and now we can get the same result with only a weight of ten pounds. The paper was interspersed with lively anecdotes, and was both interesting and instructive. He advocated a system in the exposure of plates, and not to take everything indiscriminately, but to study the locality well before taking the camera out.

A discussion followed. A number of prints by the Graphotone Company was exhibited.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

AT the meeting of the above Society on the 14th April, Mr. H. M. SMITH, of the Eastman Company, attended to show some Kodak cameras, which have already been described in these pages.

Mr. WALKER spoke of the difficulty in obtaining a supply of the rollable celluloid film with promptitude.

Mr. SMITH said that in future the Company hoped to be able to meet the demand, as they were entitled to one-third of all that manufactured in America, and were completing the enlargement of their English works.

In answer to questions, Mr. Smith said that the shutter of the Kodaks worked at about one-fortieth of a second, and that its speed may be altered by releasing the spring: this the Eastman Company are always willing to do free of charge.

The SECRETARY said that there had been complaints of markings said to arise from electrical causes.

Mr. SMITH responded that there has only been one batch yielding such markings, and it was from this, unfortunately, that Mr. Walker took those negatives which he exhibited at the Camera Club. The defect was due to coating the celluloid under as high tension as if it had been paper. Recently the machinery has been altered, so that there is little probability of any films being defective from that cause.

On April 28th Mr. F. L. Pither will lecture on "Art in Photography."

PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the above-mentioned society was held in the Public Hall, Yokohama, on the evening of Saturday, 22nd inst., Mr. J. JOHNSTONE in the chair.

After the minutes of the previous meeting had been read, the following candidates were unanimously elected members of the Society:—H. E. Watanabe, Hiromoto (President of the Imperial University), Professors B. Koto, J. Milne, and Aug. Revilliod, Mountjoy Squire (Commander, R.N.), and Messrs. J. Fraser, G. Scott, A. Futami, T. Tanaka, T. Enami, S. Nihara, A. R. Lamb, and W. Willett.

A lantern exhibition was then given. Prof. MILNE opened the proceedings by a lecture on earthquakes, illustrated with maps showing the distribution of volcanoes and of districts subject to seismic phenomena throughout the world, and more particularly through Japan, and by a set of slides from photographs of the destructive effects of earthquakes in all parts of the world. Some of these showed the danger of arched structures where earthquakes prevail, others how fractures follow vertical lines of apertures in buildings, and one how the end house of a row may be, so to speak, heaved away by the momentum of the others, which themselves remain intact.

After this there was an exhibition of a popular nature. There was a large attendance of members and visitors who seemed to thoroughly appreciate the pictures, but, unfortunately, the proceedings were considerably curtailed by a mistake of the exhibitor, who threw the words "good night" on the screen while there were still many slides to be shown. The audience rose and were out of the hall before there was time to explain the matter. The lantern was (with the trifling exception mentioned above) ably handled by Mr Takashima Matsuchi.

MESSRS. NEGRETTI AND ZAMBRA request us to publish that they pay a large sum for the exclusive right of taking photographs in the Crystal Palace and grounds, as certain enquiries have recently been made about this matter.

Answers to Correspondents.

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

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

E. C. (Burslem).—*Elastic Collodion.* Probably the best way of tempering collodion, and conferring upon it a superior degree of elasticity, is to add a very small proportion of castor oil, which is freely soluble in alcohol. This does not wash out when subsequently immersed in water, but remains permanently in the film. Only by trial—using, of course, a minimum—can you find out what quantity to add to the normal collodion to modify the film in accordance with your requirements. We should not be inclined to recommend camphor for this purpose, because of its volatility leading to alteration by atmospheric exposure.

PHOTOPHANE.—We really cannot undertake to advise about investments. You have the Prospectus, and this gives you ample means of pushing your own enquiries.

LEDBURY.—*Grains and Grammes.* Our Correspondent points out the disadvantage of adopting the contracted mode of spelling the word "grain," for with many writers who do not take the trouble of dotting the "i," there will often be a doubt about the manuscript as to whether grain or gram is intended. For this reason we have always advocated the retention of the French method of spelling the word "gramme," so as to avoid error from this cause, and give the printer specific guidance.

M. P. G.—*Oxalate of Silver*, when exposed to light, undoubtedly gives off carbonic acid, and leaves residual silver in the blackened product. From this decomposition you cannot very well argue against the oxychloride theory, there being so little analogy between the two cases; the oxalate carrying its own reducing agent, whilst none is present when the white chloride of silver is exposed to light, unless water takes part in the reaction, as has been asserted.

F. C. S.—*Impure Sulphites.* You are, doubtless, alluding to Mr. Bothamley's statement on this head. If so, you have only to test for *sulphates*, which may creep in from atmospheric oxidation, by adding to the aqueous solution of the sulphite a considerable excess of hydrochloric acid, and then testing with chloride of barium. Be careful to use pure water and HCl, and do not leave the sulphurous acid liquor exposed to the air, for it is certain to absorb oxygen, and so pass on to sulphate.

OLD HAND.—Change of name. You are never likely to hear again of Mr. Russell Manners Gordon under his old name, for the distinguished amateur bears now the Portuguese title of the Marquis de Torrebello, and resides in Madeira.

T. A. B.—*Citro-Chloride Paper.* The following proportions for a plain paper are given by Herr A. Ost, of Vienna, in Ernst Lietze's Manual of 1888. Salting solution, one part of common salt in thirty parts of water. Sensitizing bath—

Nitrate of silver...	1 part
Water	12 parts
Citric acid	1 part
Alcohol	1 ,,

Mr. Bedford described his mode of working albumenised paper with separate baths at the March technical meeting of the Photographic Society. See also page 274 of the NEWS for April 11th.

W. H. B. (Cambridge).—*Reduction of Over-Intensified Negatives.* 1. Those which have been made too dense by treatment with bichloride of mercury and ammonia may be reduced again with weak hypo, or even with very dilute hydrochloric acid. 2. Negatives originally under-developed, and therefore hard, may be improved by Mr. Farmer's process, which consists in soaking them in hyposulphite to which a small quantity of a lemon-yellow solution of potassium ferricyanide has been added. Furthermore, in printing from hard negatives, try Mr. Cowan's method of sunning from the back as a mode of toning down the violent contrasts,

J. D. and AMATEUR received.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1652.—*May* 2, 1890.

CONTENTS.

IMPROVEMENTS IN THE MOUNTS OF LENSES.

A MEETING, the results of which are likely to be of considerable benefit to photographers in this and in some other countries, was held last week in London under the auspices of a committee of the Photographic Convention, and a long report thereof is given in these pages to-day. A fair number of representative opticians accepted the invitation of the committee to be present at the meeting, the object of which was to consider the subject of standards for photographic lenses. From the general drift of the conference, it seemed that there was little chance of the opticians being likely to agree to issue diaphragms with apertures made in accordance with one particular standard, but when it came to the question of establishing a system of uniform standard flanges, there seemed to be a fair chance of agreement, and some practical steps are about to be taken to achieve the desired result. To the photographer this means that hereafter he may be relieved from the necessity of carrying an unnecessary weight of wood and brass, in the form of adapters or extra camera fronts, and that one of his objections to adding to his stock of lenses will be removed. Another blessing which may result from the meeting of last Friday will be the general introduction of camera screws of uniform dimensions.

The consideration of the subject of standard bayonet joints for lens mounts, in place of the ordinary screws, was considered by some of those present to be too large a question to take up now, but it is evident that the time lost by a photographer in screwing and unscrewing lenses, especially when they have fine threads, is a grievance, and sometimes causes the loss of a picture. Mr. G. L. Addenbrooke once exhibited at the Photographic Society some lenses specially mounted, so as not to be open to the objection just mentioned, and he has stated that he never knew what comfort in landscape photography was before he had those lenses made. If they were to be examined at the adjourned meeting of the opticians next week, their criticisms of them would be of public interest. Mr. Dallmeyer expressed the opinion last Friday that screw bayonet joints were better than pin bayonet joints for lenses.

Various opticians are feeling their way in the direction of adopting aluminium mounts for lenses, and some lenses so mounted are in the market, as already published in these pages. Some opticians are hesitating in the matter because they think aluminium to have an uncertain character, for opera-glasses are often returned for repairs because their aluminium mounts get out of order. Cases are known in private life of such mounts oxidizing somewhat suddenly into white clay, when accidentally subjected to unfavourable conditions. Defects of this kind are more likely to become evident when the mounts are made of bad aluminium, and as good aluminium is twice the price of bad, it is evident that the latter may often find its way into cheap opera-glass mounts, which are largely made in France. In fairly trying aluminium for lenses, the best only should be used. Pure aluminium has much the same physical characteristics as pure copper, but differs from copper strongly in its chemical characteristics. This is especially noticeable in its electro-chemical relations. To favour the use of aluminium in lens mounts, only the best metal should be employed, and the user of the lens should take reasonable care not to store it in a damp place.

Perhaps an alloy of aluminium may be found which will be better for lens mounts than the pure metal; but it must consist almost entirely of aluminium, or the saving in weight as compared with the weight of brass will be insufficient. A firm in the North once made harness of an alloy of aluminium and bismuth, which alloy was subject to slow oxidation, so that the harness could be polished simply by rubbing off with leather the thin coating of white clay formed.

MR. EIFFEL A PHOTOGRAPHER.

An exhibition of competitive designs for the "Great Tower" in London has been opened at the Hall of the Drapers' Company in Throgmorton Street, the place in which the coming City Photographic Exhibition is to be held. The promoters, "The Tower Company, Limited," of whom Sir Edward Watkin is said to be the leading spirit, have offered prizes of five hundred guineas for the best, and of two hundred and fifty guineas for the second best design and estimate for a tower of not less than 1,200 feet in height. The curious show of designs is well worth seeing, and will be open from Monday until Friday next week, between midday and five o'clock in the evening, admission free. On Wednesday next the doors will not be closed until ten o'clock at night.

Mr. Eiffel has thus found his imitators. It may not be generally known to the followers of the art-science that Mr. Eiffel is an amateur photographer, and that a photo-mechanical print from one of his negatives was issued some months ago in the *Revue Suisse de la Photographie*. The scene represented was a "Festival of the Grape Growers," in which the peasantry were represented enjoying high jinks at what may be called a harvest home in the wine districts.

The most remarkable specimen of retouching—if so it may be called—which we have ever seen, came from Mr. Eiffel, and was the work of a professional photographer in Paris. When the Eiffel Tower was three parts finished, we spent some weeks in studying the details of its construction, and after returning to England, received a large photograph of the tower from Mr. Eiffel. The photograph was not quite up to date, having been taken a fortnight previously. On representing this to Mr. Eiffel, he asked for its return, and it was sent to him.

A few days later the same photograph came back to us in a case by express passenger train, with the tower represented as it stood the night before the photograph last left Paris. By the skill of the hand-artist, so much of the tower had been added to the original photograph, that the picture extended off the albumenized paper, and some one or two inches of the picture were thus upon the mount itself. The work had been beautifully done; the top of the tower matched the lower part in colour and photographic appearance with surprising fidelity. Those photographers who do not like to call this an instance of retouching are at liberty to call it an example of the lateral extension of the photographic image.

Photographic Club.—Subject for discussion on May 7th, "Lenses for Instantaneous Work;" May 14th, "Photographic Definition."

Mr. Stanley.—In a graphic description of the explorer's arrival at Dover, a daily contemporary says:—"Just before the company on deck made a movement for the shore, an enterprising photographer succeeded in taking a picture of the group. He was in the nick of time. He seemed to be quite satisfied. But if the photographer got all he wanted from Mr. Stanley, it was more than anybody else got. The interviewers got nothing from him, except that he felt well enough, but that he wanted rest. They bored him."

THE GERMAN PHOTOGRAPHIC UNION.

The following notice has been sent to us of a meeting of German photographers and an exhibition at Eisenach, under the presidency of K. Schwier, a photographer of world-wide celebrity. The nineteenth travelling meeting of the German Photographic Union will take place from the 27th to the 29th of August, 1890, in Eisenach.

An exhibition is again, as formerly, connected with this meeting, in which both members and non-members are allowed to take part. To this the members of the German Photographic Union are hereby kindly invited. Non-members will be gladly welcomed as guests, but they must present themselves personally to the directorate. Notices should be sent to the Court photographer, C. Remde, Eisenach, or to the president, K. Schwier, Weimar.

The Ordering of the Entertainment.

Tuesday, August 26th.—In the afternoon at 1 o'clock, a reception of the guests at the railway station: members of the local committee will attend to meet the train; their mark of distinction will be a dark green and yellow ribbon. In the evening at 8 o'clock, issue of entertainment tickets in Gröblers Restaurant (Zimmermann). For members and those belonging to them, the price of these tickets will be ten marks, for non-members thirteen marks.

Wednesday, August 27th.—In the forenoon at 8.30, opening of the nineteenth Travelling Meeting in the hall of the Clemda.

Commencement of the Order of the Day.

At one o'clock, the opening and official inspection of the exhibition in the manufactory; at 2 o'clock, a general departure for the Wartburg; official inspection of the Wartburg. Taking of groups. Evening concert in the Wartburg.

Thursday, August 28th.—In the forenoon at 8.30, continuation and conclusion of the Order of the Day. At 12 o'clock, a breakfast at the Tivoli. At 1 o'clock, a promenade in the environs of Eisenach. In the afternoon at 6 o'clock, a general entertainment at dinner, and a sociable meeting in the hall of the Clemda.

Friday, August 29th.—In the forenoon, at 10 o'clock, meeting and breakfast at Gröbler's Restaurant (Zimmermann). At 11 o'clock, a general excursion by carriages to Wilhelmsthal. At 2 o'clock, a general lunch at the same place at 1.50 marks a head. At 3 o'clock, a farther expedition to Ruhla, and thence back again to Eisenach. At 8 o'clock in the evening, a meeting in the Clemda, and announcement of the decisions of the committee appointed for the distribution of the prizes. Conclusion of the nineteenth Travelling Meeting.

The Order of the Day.

August 27th, at 8.30 in the forenoon:—*(a)* Transaction of necessary business. *(b)* The inquiry box; every member of the directorate is willing to receive inquiries. *(c)* Opening and inspection of the Exhibition. At 1 o'clock the Exhibition will be opened for those who take part in it.

Wednesday, Aug. 27th, from 1 o'clock to 2.30.

Thursday, Aug. 28th, from 1 o'clock to 6 o'clock.

Friday, Aug. 29th, from 1 o'clock.

On Friday, Aug. 29th, from 1 o'clock at noon; on Saturday, Aug. 30th, from the same hour; and on Sunday, Aug. 31st, the Exhibition will be also open to the public.

The Exhibition will be divided into three principal groups, containing fourteen divisions, having relation to the following prizes of honour, medals, and diplomas:—

The First Group.—Particular announcements and institutions:—(*a*) Constant.—(1) A gold, a silver, and a bronze medal, given by the Festge Institution, for the three best collections of picture groups of two persons in cabinet form; open to members and non-members of the German Photographic Union*; (2) The gold medal of the Kindermann Institution, for the best collection of single portraits of the size above mentioned, open to members and non-members of the German Photographic Union*. (*b*) Occasional.—(3) A prize of honour given by Herr F. Brandseph, Sen., and Herr H. Brandseph, Jun., of Stuttgart, consisting of a silver cup (of the value of 200 marks), for the best collection of landscapes in cabinet form, open to members and non-members of the German Photographic Union*; (4) The Eisenach Institution of Herr C. Kindermann Hamburg, consisting of a complete travelling apparatus, 13 by 18 c.m., of the value of 200 marks, for the best collection of a day's work (24 cabinet portraits), from smaller studios, open only to members of the German Photographic Union*; (5) A prize of honour given by Herr Fr. Ritter v. Voigtländer, of Brunswick, consisting of 300 marks, and another of 200 marks, for the best taking of a group; open to members and non-members of the German Photographic Union.*

The Second Group.—General Union Announcements:—These are intended for members and non-members of the German Photographic Union; professionals, amateurs, and manufacturers may take part in them. (*a*) Constant; (6) A silver medal for a new rapid copying process. The successful inventor will not be bound to communicate any of the mysteries of his invention:* (*b*) Occasional. Here are announced as first prizes, silver and gold medals with diplomas attached; as second prizes, bronze medals; as third prizes, diplomas. The number of these distinctions will be left to the sole direction of the awarders of the prizes. These prizes will be conferred:—In Section A (for pure photographic work); (7) For the best photographs in the portrait department, either enlargements or direct pictures. The enlargements must, however, be executed in the studio of the exhibitor; (8) For the best specimens in the landscape department, among which are to be included studies of architecture and instantaneous takings of movable objects; (9) For distinguished performances by amateurs; (10) For distinguished scientific work, whether of a photographic or literary character. In Section B (for photographic work and reproduction); (11) For the best photograph in the department of reproduction; (12) For the best specimens in the field of new mechanical printing processes. In Section C (13) for special works, improvements, meritorious manufacture of photographic utensils (backgrounds, decorations, furniture, cameras, &c.), praiseworthy exhibitions of raw materials (chemicals, papers, cartoons, &c.) With these last a judgment of the Examining Committee of the German Photographic Union must be sent in, upon which the awarders of the prizes can rely in their decision.

To the Exhibition under the first and second groups every kind of photograph is admitted, also all appliances necessary or useful to the photographic art—such as chemicals, apparatus, backgrounds, &c.

According to No. 6 of the regulations, to the prize competition in group A7—10, as also to the institutions 1—5 (so far as the contrary is not expressed), only such photographs are admitted as have never been before shown in any exhibition, and have been prepared since the last travelling meeting of the German Photographic Union at Weimar. It is requisite for competitors to declare that these regulations have been complied with. There can be no exception to them under any pretext whatsoever.

All photographic pictures must be sent in a condition suitable for exhibition, that is to say, in frames or as collections in a portfolio. It is preferable for pictures to be framed without glass, that they may be more conveniently judged.

Pictures will, in the Exhibition, be divided into groups, &c. For this reason, landscapes, portraits, &c., should not be mounted in a single frame, but they should be framed separately, every kind by itself.

The Third Group.—Exhibition for foreigners:—(14) To satisfy numerous requests, and to maintain the friendly relation of the German Photographic Union with foreign photographers, the committee has decided upon making a special department of the Exhibition for their interests. To this all foreigners (non-members of the German Photographic Union), especially our American and English colleagues, are hereby invited. In the conditions of competition in this group, No. 6 of the above-mentioned regulations must be carefully attended to. Photographs exhibited in this group may have been exhibited elsewhere, but it is desirable that in this group also no older work than that of last year should be represented. Contributors to the third group are not bound to pay anything for space, but it is earnestly desired that the objects sent in should be left to the travelling care of the German Photographic Union, in order that they may be seen by those members of the Society who have not been able to visit the Exhibition.

In this group also gold, silver, and bronze medals, as well as diplomas, will be offered for prizes (as above).

For works, &c., in all the groups which are not successful enough to win a prize, honourable mention may be obtained.

In addition to this, especially deserving performances in any part of photography which are not included under any of the above-mentioned numbers may be especially rewarded by the consent of the directorate.

The prizes offered by the Union will only be given in cases where the exhibits reach the highest (and not the relatively highest) degree of excellence in their respective divisions.

The awarders of the prizes will consider in the first place the knowledge of technique, and artistically good execution. These features will be of the first importance in all the prize distributions.

Preliminary applications with respect to the exhibition are to be addressed to the President of the German Photographic Union, Herr K. Schwier, Weimar. Applicants included in the provisions of the second group (7 to 13) will receive thereupon application tickets, which are to be sent, after being filled up, to Herr C. Remde, Eisenach, up to the 15th of August. Exhibitors included in the third group may apply without any form.

The delivery of the exhibits must be made between the 20th and 25th of August, at the exhibitors' own cost and risk, to Herr Otto Volpel, in Eisenach. Works intended for the Sections 1 to 5 of the first group, as well as of Number 6 of the second group, are to be sent to Herr C. Remde, Eisenach, without any previous application. Upon each package is to be marked clearly, "For the German Photographic Union." Every exhibit and every

* All particulars may be obtained on application to the President.

frame—with the exception of pictures belonging to the Institutions 1 to 5—must bear upon their backs the address of the exhibitor. Every box and every cover must bear the same address on its inside. The exhibitions will, according to their estimated worth, be insured on the part of the German Photographic Union against danger of fire and water. No further accountability will be admitted. It is better, when possible, to send amount for the space required with the application. The charge for space to members of the Union is three marks for every square metre: to non-members five marks for every square metre of table, wall, or ground superficies. Every commencement of a square metre will be reckoned as a full square metre. Applications for space over ten square metres will be entitled to ten per cent. discount.

For members of the German Photographic Union included under the second group, Division A, Nos. 7 and 10, as also Division B, Nos. 11 and 12, the two first square metres will not be reckoned. From foreign exhibitors, so far as they come under the third group, no space hire will be exacted. Candidates coming under the six institutions (Nos. 1-6), will pay no space hire. The reckoning of the space hire is regulated (except in the case of unusual claims) after the actual space occupied by the pictures or frames. Applications or deliveries arriving too late can only be furnished with spaces remaining unoccupied.

The return of the goods will be at the cost of the exhibitor, after reimbursement of charges at the conclusion of the exhibition, by Herr Otto Volpel, in Eisenach.

Remittances of money must be directed to Herr L. Frank, in Eisenach.

From the afternoon of the 29th August, till Sunday the 31st August inclusive, the exhibition will be open to the public. The exhibitors are therefore required to allow their exhibits to remain on view until the exhibition has closed.

The awarders of prizes, who are chosen according to the statutes regulating the Exhibition, consist of nine persons; of these, three are chosen by the directorate. The Travelling Association then announces a list of eighteen persons chosen by acclamation, and of these the remaining six persons are chosen by the exhibitors present. These nine officials are the awarders of all the prizes. They must, according to Nos. 2 and 3 of the business regulations, form three groups, each group consisting of three persons.

The first of these groups has to judge about the Sections—I.; the second about the objects exhibited in II. A and B; and the third group has to judge about the objects exhibited in II. C. and III. The resulting judgments of these three groups will be afterwards proved and confirmed by the Collective Jury. The Collective Jury may substitute a gold for a silver medal, as an award of the highest distinction.

The critical meetings of the Exhibition will relate to—

(*a*) Lectures and Discussions.

An Entertainment Lecture will be delivered by ———. There will also be introduced to the assembly ———.

(*b*) Communications respecting the adjudicated awards and prizes for all objects exhibited will be announced on Friday, the 28th August, at eight o'clock in the evening.

The Directory of the German Photographic Union—K. Schwier, Weimar, President. The Local Committee—C. Remde, Eisenach, Court Photographer.

THE FOUNDING OF THE LANTERN SOCIETY.

The inaugural meeting of the new Society bearing this title, and having for its chief objects the development and popularisation of the optical lantern, took place in the Theatre of the Society of Arts on Friday last, when some 200 visitors attended.

The chairman of the council, the Hon. Slingsby Bethell, prefaced the demonstration by an apology for the impromptu nature of the programme, which, he said, was due less to a lack of resources than to an earnest desire to make an early beginning, with the view to placing the claims of the new body well in the foreground. Having explained that the session proper would commence on the 1st of October next, and that all applications for membership received in the interval would be treated as belonging to the year then to be entered upon, he appealed to all present who were interested in the optical lantern to bring the claims of the Society before their friends at the first fitting opportunity, and continuing, said it had been agreed that the programme of the Society might best be carried out:

1. By the engaging of premises in some central position in London, at which the meetings of the council and of the Society might be held.

2. By acquiring suitable apparatus for the purpose of giving exhibitions of general and scientific interest to both members and their friends.

3. By obtaining the services of specialists in every branch of art or science suited to optical demonstration.

4. By offering—as far as the funds of the Society will permit—remuneration or awards for the development of the optical lantern, and of all apparatus pertaining thereto.

5. By imparting instruction to those who are desirous of learning how to effectively manipulate the optical lantern, to produce slides and apparatus, and to efficiently employ the same both in private and in public.

6. By assuring for the members of the Society special and advantageous terms from manufacturers and others for the purchase or loan of apparatus and slides.

7. By forming a large and comprehensive loan collection of lantern transparencies pertaining to art, science, and kindred subjects; such loan collection to be placed at the disposal of every member, upon conditions to be laid down by the council.

8. By providing a means of inter-communication between the members of the Society, whereby each member may be made acquainted with the private collections of his fellow-members, and may be able to negotiate a mutual loan if so desired.

9. By arranging an interchange of demonstration between photographic, microscopical, and other societies interested in optical lantern work.

The Chairman further remarked:—

"The marvellous powers of photography to illustrate and bring home to the mind in the most striking and faithful manner, especially by means of the optical lantern, the glories and beauties of nature, the treasures of art, and the wonders of science, induced us to hope that, by drawing together persons thus interested, a powerful society may be formed on an intellectual, educational, and scientific basis, with a recreative and social side, and of which our present meeting is but a crude and incomplete example.

"Although not a club in the usual sense of the word, still we hope soon to have a suitable habitation, where meetings of members will be held, papers read, discussions encouraged, and some photographic work carried on.

"Composed, as I believe we shall be, of scientific and practical men, of professional as well as of amateur photographers, of those learned in chemical, microscopical, and optical science generally, constructers and designers of every description of apparatus, we shall endeavour at least to benefit and instruct each other, if not those unconnected with us, and bring to greater perfection in all its phases and aspects—technical as well as artistic—this particular branch of the art and science which we have adopted for study.

"Another aim that the Society has in view is the formation

of a large loan collection of lantern slides, complete in its classification, arrangement, and method of illustration.

"As we advance, scientific and photographic societies, educational bodies, schools, and institutions will have facilities of affiliating themselves to us, and thus obtaining much assistance from our extensive photographic library, so to speak. Members will, of course, receive this privilege to a larger extent, and many more, for eventually we hope to offer them additional advantages, viz., the use of dark rooms and laboratories for all photographic operations, the production of lantern slides in particular.

"America has already made great strides with the optical lantern, so we shall endeavour to put ourselves *en rapport* with our cousins across the Atlantic, and to interchange with them for photographic illustrations of *their* grandest wonders of nature representations of some of *our* homely but lovely scenery.

"Welcoming, as members of the Lantern Society, all thus interested, we shall develop, I trust, into a large and influential body, competent and willing to place any fresh knowledge and experience that we may acquire within the reach of others of like tastes.

"Finally, growing in strength, we may number amongst our body members, practically and scientifically, more learned in particular branches of science, who will come forward and initiate us into the meaning, mysteries, and beauties of many of our unappreciated photographic illustrations."

Following the address of the Chairman, which was cordially received, there were projected upon the screen about 130 fine slides divided into three different lots, and comprising—Views by Ferrier and Soulier, of Italian and Swiss scenery, ice scenes in Swiss mountains and at Niagara; astronomical photographs of the moon and of the eclipse of the sun, taken with the Lick telescope; views of the Forth Bridge and of the engine room of the *City of Paris* after the accident to her machinery; representations of old lace from the South Kensington Museum; a large collection of Woodbury slides of Indian and Syrian Temples; types of heads; views of English Cathedrals, both interior and exterior; insects mounted direct on glass; views of the Paris Exhibition; and a large collection of landscapes from all parts.

In the interval that elapses before the programme of the Society is entered upon in earnest, the Council will be busily engaged in drafting bye-laws, selecting suitable accommodation for the future home of the Society, and the Honorary Secretary, Lieutenant C. E. Gladstone, R.N., will be pleased to forward full particulars and applications for membership, upon receipt of a post-card at 6, Bolton Street, Piccadilly, London, W.

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

THIS Photographic Convention for 1890, under the presidency of Mr. C. H. Bothamley, will be held at the Town Hall, Chester, on June 23rd to 28th, 1890, inclusive.

The Council consists of Messrs. Conrad Beck, W. Bedford, C. H. Bothamley, F. A. Bridge, J. J. Briginshaw (Hon. Secretary and Treasurer), F. P. Cembrano, E. Clifton, E. W. Cowan, A. Cowan, T. R. Dallmeyer, G. Davison, A. R. Dresser, F. Evans (Local Hon. Secretary, Eastgate Buildings, Chester), W. P. J. Faweus, S. H. Fry, Friese Greene, A. Haddon, F. Haes, H. M. Hastings, Adolph Levy, A. Mackie, E. W. Parnell, A. Pringle (Chairman), T. Samuels, J. Traill Taylor, G. Watmough Webster, and J. B. B. Wellington.

SUPPRESSION OF HALOS IN PHOTOGRAPHIC PROOFS.—*Paul Henry and Prosper Henry.*—The authors succeed in avoiding these halos by covering the back of the plate with a layer of normal collodion holding in solution a small quantity of chrysoidine. This varnish having an index of refraction little different from that of glass, completely suppresses the halos.—*Chemical News.*

LANTERN SLIDE WORK.*

BY GODFREY BINGLEY.

WHAT I have to say this evening will, in a great measure, be based on my own short experience, and though what I may bring forward may be "stale, flat, and unprofitable" to many of the older members of this Society, I trust that it may be of some little assistance to any who have not yet attempted to make lantern slides. For some reason or other, only a small proportion of the members of this Society sends in lantern slides to our annual lantern exhibition. Certainly there is no better or more pleasing way of showing photographs than by exhibiting them on a screen with the aid of the optical lantern; the fact that so many people go to our lantern exhibitions is in itself a proof that this branch of photographic work is appreciated, and to the photographer the artistic qualities and *failings* of his work become more manifest when seen enlarged on the screen, than when viewed on a small print. Before proceeding farther, it may be well to allude to the best size of camera to work with, as some amateurs do not care to make anything but lantern slides. Small cameras are made to take a plate $3\frac{1}{4}$ square, and although this small-sized camera may do for ordinary landscape work, it is practically useless for instantaneous photography, such as marine and seaside studies, cattle pieces, and other moving objects. Many of you, no doubt, who work quarter-plate cameras, have found them too small for this class of work, and have been considerably disappointed, when the plate has been developed, to find nothing but a barren waste of water, or a field with the surrounding fence the only subject on the plate. I would therefore advise nothing less than quarter-plate, or 5 by 4.

Lantern slides are made either by "direct contact," or by "reduction" from the negative by re-photographing from the negative by means of the camera and a reducing frame.

Slide making by "direct contact" is the plan most generally adopted by amateurs, because of the ease with which it can be done by artificial light; but I very much prefer, however, making slides by "reduction," especially if working from a half-plate, or larger negative. No doubt very good slides are made from quarter-plate negatives by "contact," but how few pleasing ones are made from the larger sized negatives in this way, for when taking a view with the camera, you study the proportions and composition of the picture in relation to the size of the plate you are working, and not simply with the idea of printing out a picture $3\frac{1}{4}$ square; it is only by "reduction" you can get the full value of your negative on the lantern plate. Another advantage obtained by "reducing" is that a soft slide may be made from a hard negative, and also good slides from poor and faulty negatives, negatives from which it would be impossible to make a slide by "contact," or even to get a passable silver print from. In "contact" printing, the length of exposure required of course varies according to the make of plate used and the density of the negative. I think it is best to have one fixed distance from the light for exposing the slide, and to vary the *time* of exposure according to the density of the negative, rather than vary the distance. If the *distance* the frame is held from the light be varied, always remember that the length of exposure will increase as the squares of the distances the frame is held from the illuminant, and not in a numerical ratio; for example, if an exposure of

* A paper read before the Leeds Photographic Society.

10 seconds at one foot distance is sufficient, and the distance is increased to 3 feet, an exposure of 90 seconds will be needful.

For making slides by "reduction" some sort of reducing frame is required to hold the camera and negative: the apparatus is, however, very simple. It consists of a baseboard on which there is a sliding block to carry the camera at one end, and at the opposite end a deep box about ten or twelve inches square, open at the end next the camera, the other end holding a sliding carrier in which to place the negative.

"Reductions" are best made by daylight. The plan I adopt is as follows: Having placed my reducing frame, on which I have fixed a quarter-plate camera, in front of an upper window (in the lower square of which I have inserted a sheet of ground glass for the purpose of diffusing the light), I place the negative in the sliding carrier and carefully focus it, then stop down the lenses to U.S. 16, and expose the plate in the usual way. The exposure, of course, varies according to the light and density of the negative as in "contact" printing; at this time of the year the exposure will vary from 30 seconds to a minute with a fair average negative. A long exposure and retarded development will give warm tones; a short exposure and active development will give black tones, and I find the tones are always warmer if the exposures are made on a bright, sunny day, than even with a long exposure on a dull day. I advise, however, that workers should adhere to one *standard strength* of developer; and for "contact" printing one *fixed distance* from the light for exposure, and produce the tone desired solely by the time of exposure. If this plan is adopted I am sure much more satisfactory results will be obtained than by continually altering the strength of the developer, and varying the distance the plate is held from the light.

Most of the slides prepared by professionals are made by the collodion or wet plate process; very fine slides are also made by collodio-albumen.

It is generally considered that there are no lantern slides at all equal to those made by one or other of the collodion processes. No doubt for brightness and "sparkle" collodion slides are difficult to surpass, but there is often a want of half-tone about them, consequently little gradation between the high-lights and shadows. The gelatine plate is running the collodion process a very hard race; and I venture to think—though it may be considered somewhat heterodox to even throw out the mere suggestion—that for softness and half-tone the gelatine plate holds the field. I do not propose to enter into any details of the working of the collodion processes, neither do I intend to say anything about preparing gelatine plates, as I have had no experience in any of these branches of photographic work. I know there are several of our members present who prepare their own plates, and who have in the past given us the results of their experience. There are many good makes of plates on the market, and for those who do not care to make their own, I would say try several makes, and then stick to those you find give you the best results. I may say in passing that gelatino-chloride plates are of no use for reducing, as they are far too slow.

Lantern plates are usually developed either by ferrous oxalate, pyro and ammonia, pyro and washing soda, or hydroquinone. Formerly ferrous oxalate was the favourite developer for lantern plate work, but it is not so much used now. The tones produced by it are always of a cold grey, and considerable care is required when working with it, for the slightest contact of hypo will cause a fog to spread over the plate. Pyro and ammonia is a favourite developer with many workers; some add a little carbonate of ammonia to obtain red tones. A very good developer, and one easy to work with, is washing soda and pyro. It gives pleasing tones, but it has, however, the disadvantage of often leaving a yellow fog on the plate, which must be removed by a clearing solution, and, unless considerable care is used in clearing, many of the finer details may be entirely removed; and if allowed to remain in the solution too long, the plate loses its sharpness, and looks flat when shown on the screen.

Hydroquinone has now come into great favour as a developer for lantern plate work, and is the one I prefer to all others. It gives absolutely clear glass, and the slides require no clearing after development, unless they have been taken from thin or faulty negatives, when a little local clearing by means of a camel's hair brush may be required.

The formula that I like the best is one given by Thomas and Co. with their plates, viz.: —

No. 1.—Hydroquinone	...	...	160 grs.
Sulphite of soda	...	...	2 ounces
Brom. amm.	...	...	20 grs.
Citric acid	...	...	60 ,,
Water	...	...	to 20 ounces
No. 2.—Carbonate of potash	...	...	2 ounces
Carbonate of soda (crystallized)		...	2 ,,
Water	...	...	to 20 ,,

Use an equal quantity of each.

I generally develop four plates with 2¼ ounces of solution. I have developed as many as ten, but four are quite sufficient, for after that number the developer becomes very slow, and has a tendency to "block" the shadows.

Eikonogen is said to produce similar results to hydroquinone, but I have never tried it.

It is better to develop slides by artificial light rather than by daylight passing through some non-actinic medium; for daylight is so variable in its intensity that it renders it difficult to judge the proper density of the slide in consequence; whereas, by artificial light, you can have one fixed standard, and develop the slides to pretty nearly an equal density. It is desirable to develop a little denser than required, as the slide loses a little of its density in the fixing bath. Immediately after placing the plate in the developing solution, pass a camel's hair brush (kept in a cup of water near the developing dish) rapidly over the plate, to remove any small air-bubbles which may be on the surface of the film. After development, the plate requires a good wash under the tap, and should then be placed in the fixing bath:—

Hypo	...	...	...	...	1 ounces
Water	...	...	...	...	20 ,,

And allowed to remain there for a few minutes after all whiteness has disappeared, so as to ensure thorough fixation. Wash again after removal from the fixing solution, and place it for a short time in a saturated solution of alum to harden the film. If working with hydroquinone, on no account place the plate in the alum solution *before* fixing, or you may obtain a result not to be desired.

If from any error in exposure, or if the slide is taken from a thin negative, causing it to be opaque when there ought to be clear glass, this opacity may be removed with a

little care and patience by the aid of the following clearing solution :—

Sulphate of iron	3 ounces
Alum	1 ounce
Sulphuric acid	1 ,,
Water	20 ounces

Pour a little of this solution into a small dish, and place a basin containing clean water near; then, holding the plate in the left hand, with the sky or fogged part slanting downwards, so as to prevent the clearing solution running into the details of the picture, paint with a small brush the clearing solution over the fogged part of the plate until it becomes quite clear, frequently dipping the plate into the water during the process to prevent the clearing solution spreading over the plate. Any over-dense shadow may also be reduced in this way. Before doing this, take care that the slide has been in the alum bath. Lantern slides must be quite free from fog or veil; the above method will quite remove this defect, and, if care is used, the details of the picture will not be injured. After fixing and clearing as above-mentioned, the slide should be washed for a few hours in the same way as an ordinary negative. On taking the plates out of the washing trough, it is advisable to give each a good rinse under the tap, so as to remove any particles of grit that may have been deposited on the film from the washing water, and then place them on edge to dry—not in a rack—where they will be kept quite free from dust.

There are several methods of toning slides, but I have not tried any of them, for I much prefer the rich brown, or even the black tone of the ordinary photograph, to the red or other tints that may be obtained by toning, and I believe there is considerable risk of a toned slide fading away.

When the film is thoroughly dry, it is ready for mounting for the lantern. I am sorry to say there is often but little care exercised with this part of the work, and many an otherwise good slide is completely spoiled by the careless and slovenly way in which it is mounted. The photograph and cover glasses should be absolutely clean, and free from all dust and finger marks: and here I would say a word as to the thickness of the cover glasses. Very thick glass adds much to the weight of the slides, as you will find to your cost if you have them to carry far. The *extra thin* covers are the nicest, but, unfortunately, they soon break when using the slides: even the pressure of the fingers will do this; therefore, I would say, use a medium thickness of glass, and take care to have it free from scratches and air-bubbles. The paper mask to be placed between the photograph and the cover glass should be of suitable shape, and carefully adjusted to the size of the photograph; on no account use the circular masks, as this shape is most inartistic, and frequently quite spoils the picture. The masks having one white side and the other coloured are the best, as the white side is an indication to the lantern operator as to the side of the photograph to be placed next the light, and it also enables the name of the slide to be written upon it. The binding strips should be neatly put round the edges of the slide, and two white or coloured discs placed on the two top corners of the front of the slide, to show at a glance which is the top of the view; then carefully remove all finger and gum marks, and the slide is complete.

We have to thank Mr. Walter Colls for an excellent print of Dr. Emerson's "Breezy Marshland."

PHOTOGRAPHIC EXHIBITIONS IN INDIA.*

In photographic circles, both at home and in India, there exists much divided opinion on the subject of exhibitions and awards. One section is totally averse to both, another would hold the one and withhold the other, a third is strongly convinced that both exhibitions and medals are as the breath of our nostrils, whilst a large and growing section believes that the present system of awards must be purified and elevated. Without expressing a decided opinion on the question one way or the other, it will afford food for reflection if the system on which the Society has hitherto held its exhibitions is examined. Those diligent members who study the rules are doubtless aware that one of the objects of our Association, as laid down in the constitution, is to hold exhibitions of photographs and photographic apparatus. It is not stated how often; but they are to be held in Calcutta. As a matter of fact, these exhibitions have been held regularly every year since the resuscitation of the parent society in 1887, and since then no little money—let alone time and energy—has been spent in carrying out this object. For instance, at the late exhibition, no less than six gold and eighteen silver medals were awarded; and, as there were only sixty-four competitors in all, no one is likely to turn round and accuse the committee of dealing them out with a niggard hand. Of this number of competitors nineteen only were of the so-called professional class, whilst forty-five were amateurs. With this preponderance of the amateur over the professional, it might naturally be supposed that the amateurs would have carried off at least half the medals, but this was not the case. No less than five gold and nine silver medals went to the nineteen professionals, and only one gold and nine silver to the forty-five amateurs. But the members of the Society come out of the analysis even worse than this, for only six medals rewarded them for all they contributed, and not one of these was in gold. With such a result staring us in the face, it may well be asked if the proportion of medals offered to Anglo-Indian amateur photographers was generous enough to foster that emulation which, some say, only medals can impart.

On the other hand, there is a strong feeling amongst those who say they know that, if medals are not freely offered to outsiders of both classes of workers, our exhibition walls will be covered with silver prints of that respectable mediocrity which they suppose is the supremest effort of the Anglo-Indian amateur photographer. Now this contention is not unreasonable if the only way of alluring the best pictures to our walls is by a liberal offer of medals. But is this the case? If the best pictures are necessary for educational purposes—and this may be granted—every one of the pictures sent by the home professionals might have been purchased and sent out to us at probably less cost than we actually paid under the present system. And as regards the local professional photographers, who contributed not a little to the embellishment of our show, I have been told by one of the largest winners amongst them that they are not likely to feel aggrieved, should the Society decide to exclude them from medal-winning, so long as they are all placed on the same footing. It is sufficient inducement to them, I am assured, to be allowed to exhibit their works in an attractive form, with the name of the firm displayed over them. There should be no difficulty in arranging to have this done. And the

* From the *Journal of the Photographic Society of India*, April.

amateurs at home and in America whose works contributed so much to our pleasure and profit, how are they to be rewarded, if not with medals? This is the real difficulty; and, if it is wished that the best works shall grace the walls of our exhibition, the Society must be careful how they treat their brethren who have become masters of photography. In this matter it may be submitted that there is a discreet middle course in which to steer. We should welcome the works of every well-known amateur, no matter what his particular school is, because there is good to be got from the study of all good pictures, and be prepared to offer inducements to amateurs to exhibit such as are acceptable and fitting in the circumstances of each case. So competition should be optional. To all who care to compete, let medals be given; and to those who do not, let the Society engage to pay all expenses of the exhibits to and from Calcutta. If this is done, promising every care and attention to prevent damage or loss, and engaging that these honourable exhibits shall be well mounted and hung, there is every reason to believe that the applications for space will be as great, if not greater, than they have ever been before.

In arranging an exhibition on these lines, precautions would have to be taken to divide off the exhibits so that no invidious comparisons could be made between the medalled pictures—presumably second-rate—of, let us say, the writer, and a greatly superior one of the same class of, say, Dr. Emerson sent *hors concours*.

This is a matter in which the members themselves are directly interested—one, if I may say so, of almost vital importance to the Society—so that its discussion in the columns of the Journal is earnestly invited, seeing it is likely to be of the greatest value to the Committee when they next meet to settle the prospectus of the next annual exhibition.

CROSSING NATIONAL FRONTIERS WITH DRY PLATES.

Photographic Scraps for May contains some useful information for Continental tourists, and states that in Sweden and Norway the photographer will have no difficulty at the Custom House, provided the photographic baggage is not too large; but as good stocks are kept in the country, it is not necessary or advisable for a traveller to burden himself with large quantities. There is no restriction on the taking of photographs in the streets or country, but, naturally, for church or museum interiors, one requires to obtain permission, not difficult to obtain as a rule. In Russia, things do not go so smoothly with the tourist. Photographic apparatus for tourists' *own use* is charged with a duty equal to about 8d. per English pound, and plates with one of about 3½d. per pound. Photography on its amateur side is so little known to the Russian Custom House officials that they have not the faintest idea of the sensitiveness of plates or papers to the light; consequently the poor traveller has a rough time of it, unless forewarned. To take views almost anywhere, one requires the permission of the authorities, and, to obtain this permission, tourists should obtain before leaving home a certificate from the Russian Consulate in England, that the bearer desires to take photographs, is an amateur, and proposes to use such photographs only for his own pleasure. In Holland and Belgium, plates carried by tourists are liable to pay ten per cent. duty. As a rule, the Customs do not insist upon opening the boxes; but, as the revenue officers are apt to suspect smuggling in every form, they may at times examine the plate boxes; still, it will be done politely, and in a properly appointed dark room. In France, plates, on entry, whether for the traveller's own use or as merchandise, are dutiable to the extent of 18·50 francs per 100 kilos, equivalent to about 3s. per pound English. Apparatus, if well worn, and clearly for personal use, is passed free of duty; if new, ten per cent. is levied. Usually the Customs officials are most easy about the enforcement of these duties, and about the examination generally, when it is plain that one is not other than an amateur; but the tourist who goes loaded with heavy photographic impedimenta may find he has to pay these legal, but seldom imposed, duties. Most officials have by this time learnt the disaster which follows the opening of plate-boxes in an ordinary room, and are daily becoming more complaisant with amateur photographers, and seldom or ever does any trouble arise. As to the taking of photographs, but little restriction is imposed, as long as fortifications are avoided. In Italy, plates are dutiable to the extent of 1s. per kilo, or, if accompanied by a certificate of origin from the Italian Consulate in London, of 3d. per kilo. Apparatus for personal use is not charged for. If the camera is new, the Customs may insist on a duty being paid, but will, if requested, give a certificate, on the production of which the duty will be remitted on leaving the country. The officials are very tender with amateur photographers, and a few boxes of plates, and any apparatus, may be readily passed without either trouble or payment of duty. Photography may be freely practised in any and every town the informant thinks, with the restriction not to approach too near fortifications. He recommends the use of hand cameras, which the populace have not yet learnt to recognise as such, as a tripod and large camera always collect a crowd of ever-present idlers. In Germany, the actual imposition of duty leviable on all plates is more honoured in the breach than in the observance, whilst apparatus enters free. The Customs are well used to tourists carrying cameras, and no difficulty is met with. If the traveller should be asked, as a matter of form, to open a box of plates, he is taken courteously to the dark room; the examination is made promptly, and, with many apologies, he is speedily released. If fortifications are avoided, there is practically no limit to the opportunity for taking photographs, unless it is in some of the watering-places, where permission must be asked for, and is readily obtained. In Switzerland, the favourite hunting ground of tourists, photographic and otherwise, the greatest attention is given to the needs of photographers, and the Customs allow both apparatus and plates carried by tourists for their own use to pass free of duty. Photographing seems absolutely free from restriction throughout the country. Greece offers a wide and interesting field, and the Custom House people offer no difficulty in the way of free import of tourists' apparatus and plates. Visitors should not carry too many of the latter. There is no restriction on the taking of photographs, and it is needless almost to say that Athens and its neighbourhood offer sufficient scope for weeks of pleasant labour. The ruins of Olympia in Western Peloponessus, the Vale of Tempe, and the monasteries of Kalembak in Thessaly, the Islands of Corfu and Zante, with Eleusis and Dafne, are all easily reached. Travelling in Greece, even in districts remote from the beaten track, is quite safe. For farther information see *Photographic Scraps*.

PHOTOGRAPHY IN FICTION.*

ANOTHER interesting story of an equally speculative character, though of a totally different kind, is told in an American magazine. A photographer, who calls himself a photographic artist—explaining that this title costs nothing, and affects people with much the same sort of respect as those well known combinations of letters B.A., F.S.A., M.A., F.R.G.S., D.D., with many others—is invited down to a small country village to photograph a Church inside and out. The lady, the deceased incumbent's daughter, a certain Miss Jones, who has invited him, is taken suddenly ill on the day of his arrival, and is unable to see him. Not to waste his precious time, the photographer takes portraits of the present incumbent—to be sold after to his flock for money to be spent in repairing the church—of two children, and a pair of lovers. Every professional knows both these last to be among the worst of subjects. The lovers insist on arranging each other; the children cannot be arranged at all. The result is commonly disastrous. Even if a good picture be obtained, people paying for the work are mostly dissatisfied. The mother finds the true image of her spoilt brat different from her ideal. The face of the beloved is not, for the lover, sufficiently heavenly; but the eye of the camera is not like that of the mother or the lover—it is not blind. If, on the other hand, a bad picture is the reward of the photographer's toil, then is the wrath of Romeo a terrible and awful thing, while Juliet weeps silently as she gazes in disgust upon her distorted image. As for the spoilt child, after spoiling in its turn some half-dozen plates, seven devils enter into it, causing its last state to be worse than its first: and, in the end, with some twenty eyes—a very Argus—and about ten times that amount of fingers—a very Briareus—it reflects, collectively, the portrait of a catherine wheel in mid-effervescence. To return, however, to the story. The lady recovers. The photographer is placed outside the church in the very worst position. That ecclesiastical building is sacrificed to an elaborate stucco tomb, with a narrative of the many virtues of the lady's father, the Rev. Jeremiah Jones, M.A. In the inside of the church, the operator, placed once more in the worst position, is instructed to make a picture including the pulpit, the vicarage pew, and the communion table, adorned on either side with the commandments blazing in gold on an amethyst ground. In vain the unhappy photographer explains that the amethyst will turn to opal, and inky sable occupy the place of gold. The lady is not to be moved by what she doubtless considers baseless representations to defraud her of her stipulated right. Difficult, indeed, is it to persuade her that it is impossible to include in the same picture the font, which lies at the other end of the sacred edifice. But this being at last accomplished by the rhetoric of the photographer, he sets at once to work. The windows of this church are filled with wondrous creations in green and yellow glass, not altogether the best light for photography, but bravely the artist struggles on. During some twenty minutes' exposure, he beguiles the time by reading the names of the pew occupiers printed on their respective pews, the gorgeous decalogue, one or two commemorative tablets, and a neatly written placard attached to a pillar conveying the information that a man may not marry his grandmother. Marvelling much at this, he moves to put on the cap, when suddenly the "church-going" bell, as Cowper calls it, begins to toll. Though a lion be in the path between the artist and his instrument when the time is come to affix the cap, yet will he affix it. The inhabitants of the hamlet cluster together at the church door to learn the meaning of this unwonted bell-ringing. Among them appears Miss Jones herself, majestic but angry. "What irreverent action is this?" asks the lady. "How should I know, madam?" replies the astounded photographer; adding in an injured tone, "and, as for irreverence, have I not been standing here for half-an-hour with my hat off in a draught as bad as that of a blacksmith's bellows?" It is afterwards found that some of the village fry have rung the bell, but the photographer has gone in a pet to develop his picture. It grows, considering the difficulties he has had to meet, well. The carefully worked cover of the communion table—the long loving labour of some pious Dorcas—commences its second birth; the carved oak rails emerge one after the other in satisfactory sequence, the decalogue appears—alas! no longer aglow with its original glory—the vicarage pew, and the pulpit. Yes, the pulpit; but what is this spectral figure which rises out of it? An old gentleman with a black mole, in a black gown, with white hair and in white bands. The photographer marvels, but presents in due course, the photograph to Miss Jones. "Ah!" shrieks that lady, "it is—it is papa!" and faints forthwith. "I keep," says the photographic artist at the conclusion of this little American tale, "I keep that negative among my curiosities."

This paper might perhaps, in the reader's estimation, be called "Fiction in Photography" with a nearer approach to descriptive truth than is made by its present title, "Photography in Fiction." Several other tales may be found by any who care to search for them, which in no degree lessen or detract from the fitness of the former heading. One, for instance, tells of a young girl about to become a bride, who, chancing to take refuge under a poplar during a storm, received an image of that tree through her petticoats on her left leg, leading afterwards to a remarkable identification. Tales of the photographic effects of lightning are indeed frequent. Besides the well-known anecdote of the boy who climbed a beech on a Sunday for the sake of robbing a bird's nest, and was punished with a distinct view of a bough and a bird's nest on his right cheek—a gruesome spectacle, and a warning to all who chanced to meet him—we have the story of the sailor who went through life with the picture of a horse-shoe affixed to the mast-head on his back; of the respectable tradesman who bore the device of a couple of sovereigns on his side, supposed to be taken from these two pieces of metal in his purse; and—though this last story seems, as regards its genuineness, open to doubt—the story of the unhappy lover who died of love, and bore, as the doctor who anatomised him after death discovered, the portrait of his lady's face distinctly photographed on his heart.

* Continued from page 313.

NUMBER 6 of *The Photographer*, published at Cincinnati, Ohio, issues as its supplement a specimen of engraving by the Photo-Engraving Company, of New York, the subject being an unacknowledged reproduction of Mr. H. P. Robinson's picture, "He never told his Love," here entitled—perhaps more appropriately—"A Morning Chat."

DINGLER'S *Polytechnischer Journal* says that to persons unaccustomed to it, ammonia in the atmosphere becomes mischievous when present in the proportion of 0·05 per cent.; 0·06 per cent. will kill most animals in an hour and a half. Up to 0·03 to 0·05 per cent. the system can become accustomed to ammonia; but beyond that proportion the ill effects very rapidly come on.

Notes.

It would be interesting to have a little more information concerning a process of photographic reproduction invented by Mr. Henry Sutton, of Ballarat, Victoria. It has been stated that "The inventor follows a method essentially different from those hitherto used. He makes his prints on gelatine, but not by means of dots or lines, nor even by the process for printing with fatty inks. He utilizes the ordinary gelatino-bromide plates, and impressions them in front of the object to be reproduced. The surface of the image is simply covered with a piece of gauze, and afterwards developed and fixed in the ordinary manner. The plate is then placed for five minutes in a bath of water heated from 79° to 80° F. The excess of water is removed by a sojourn of ten seconds in alcohol. After drying, the plate is placed in a copper planchet, heated to 212° F. over a Bunsen burner. This degree of heat is maintained for about two minutes. The plate is then ready for the printing press."

Professor C. Michie Smith, at the last meeting of the Royal Society, described a curious application of photography to scientific research. The object desired was a method of determining surface tensions by measurement of ripples. Ripples are set up on the surface of the liquid by means of a tuning fork, and the surface is then photographed along with a suitable scale. The lengths of the ripples can thus be obtained by micrometic measurement of the negative. This, we fancy, represents the latest instance of the long list of instances in which photography has been utilised to solve some problem of science.

It is stated that the great and unprecedented rise in the price of platinum is causing much anxiety. The various platinum printing processes have been received with such favour by the photographic public that the demand for the metal has, during the past four months, much exceeded the possibilities of supply. As we mentioned some time ago, there was for a few days literally a famine in platinum, the manufacturing chemists being unable to make the photographic salts in sufficient quantities to meet the orders of their customers. They have now got over this difficulty, which of course was only a temporary one, but the inevitable has come about—a great rise in the price, the quotations now being about forty per cent. higher than they were a year ago.

The awkward point in the matter is that platinum, unlike a chemical product, cannot be cheapened by the increased demand. It must be sought for, and dug from the mines, and up to the present moment the uses have been so limited that it has not been worth while for anybody to "prospect" likely sources for its discovery. No doubt this will be done now that photography promises to be an outlet for its utilization, but meanwhile the supply, to use commercial phrase, is "short," and likely to be so. A financial paper suggests that some of the active minds engaged in mining matters might do worse than embark in the search for platinum. If so, perhaps platinum may be discovered in "paying quantities"—at least, this is what the prospectus of any platinum company is sure to say.

Artists are less fortunate in their actions at law when the point at issue turns upon the faithfulness of a portrait than photographers. It is a curious fact that in the disputes as to the fidelity of a photograph which have found their way into the English County Courts, not one case in twenty has been decided against the photographer. It may, of course, be that the photographer starts with the advantage of the generally received dictum that photography cannot lie, but too much stress must not be laid on this, as we may presume a judge is not to be biassed by outside opinion, but will decide every case on its merits. However this may be, the fact remains as stated.

Nor do we think that if English County Court judges imitate the example set them recently by a Berlin legal authority, the result would be any different. In this case the fidelity of a portrait in oils was in dispute, and the judge in question adopted the course of directing the lady to array herself in the dress in which she sat to the artist. The plaintiff obeyed, with the consequence that the judge gave a verdict in her favour. It is a common thing, as most photographers know, for a lady to find fault with her photograph, not because the face does not please her, but because the dress does not "come out" as she expected. Hence, if an order similar to that of the Berlin judge were enforced, the chances of a victory would be still more problematical than they are at present. On the whole, photographers need not fear the consequences of the Berlin episode.

A good deal of complaint is being heard as to the way the frames of the pictures sent in to the Royal Academy are treated. An artist friend the other day had his picture returned, which he did not mind so much, as it was within the right of the immaculate Forty to reject it; but what he did object to was that the frame—an expensive one—was irreparably damaged. It is well known that the pictures are stacked one against the other, and that, to get some particular picture, the carpenters will not hesitate to walk over the stacks, much as a cat walks the tiles, but scarcely so lightly. If they wore slippers not so much harm would be done, but, in the case of hob-nails, the frames suffer. When complaints were made two or three years ago to the Photographic Society that the frames were damaged, we believe the Council compensated the owners. The Royal Academy is above this consideration, and all the artist can do is to suffer in silence, or write to the newspapers.

THE PHOTOGRAPHIC CLUB.

THE annual report, list of members, rules, and proceedings of the Photographic Club, for the year 1889, has just been issued. This popular Club was established in 1879. On the title page its honorary officers are stated to be:—*Trustees*—William Bedford and Frank Haes; *Committee*—W. Benham, F. P. Cembrano, H. E. Davis, E. W. Foxlee, A. Mackie, E. A. Newell, J. B. B. Wellington, and J. W. Zaehnsdorf; *Curator*—H. M. Hastings, F.I.C.; *Recorder*—E. Clifton; *Librarian*—C. E. Hesse; *Secretary and Treasurer*—F. A. Bridge, East Lodge, Dalston Lane, E. The meetings of the Club are held every Wednesday evening at Anderton's Hotel, Fleet Street, London. The treasurer's report sets forth that the year ends with a balance in hand of £129 17s. 6d., and that it has other funds and property.

The longer papers read at the meetings of the Photographic Club have for the most part been published in these pages, but a variety of useful information will be found in the official reports of its meetings.

In the discussion on "Purifying Water for Photographic Purposes," Mr. A. M. Levy said that, roughly speaking, there were three kinds of impurities in water—insoluble substances, which might be removed by filtration; soluble substances, such as chlorides of sodium and magnesium; and gaseous matters. The latter might be ammonia or carbonic acid, and might be got rid of by boiling the water for about half-an-hour. The addition of a little carbonate of soda would precipitate the chlorides. The usual amount of solid matter in the water supplied by the London water companies was about two grains to a gallon. The impurities in water varied considerably according to the local conditions of supply; sometimes water contained as much as twenty-five to thirty grains per gallon of calcium or magnesium salt. A ready method of estimating the quantity of magnesium or lime salt was by means of Clark's test. A solution of definite strength was made of Castile soap in spirit; this was added, drop by drop, to a measured quantity of the water to be tested until the froth formed on shaking was permanent. The amount of the salts present was arrived at by the amount of soap solution used. He considered the most convenient method of purifying water for photographic purposes was boiling it for half-an-hour and then leaving it to cool. It was an advantage to boil the water in a kettle that was already encrusted with scale. In reply to questions, he said that the addition of a small quantity of alum would precipitate organic matters, as also would iron chloride; but such treatment was more suitable for ordinary purposes than for photographic ones. Permanganate of potash would also get rid of organic matter. The hon. secretary stated that solutions were sold to prevent the incrustation of boilers. He had seen some dark fluid which was reported to have been very effectual. Mr. Levy said that there were scores of such in the market. The acting ingredient in all was carbonate of soda; they were coloured to fancy.

In the discussion on "Copying Engravings and Woodcuts for Lantern Slides," Mr. A. Cowan said that if the originals were faulty, as many woodcuts were, it was impossible to get a good solid picture from them. The little ink on the dark parts allowed the white paper to show through. This, when magnified, became much more apparent. If the lines in the original were continuous the copy would be all right. Mr. T. C. White thought it probable that a negative made from a tracing in ink would be better than from the original. Mr. E. W. Foxlee stated that some years ago he had made some 10 by 8 transparencies from pictures in *Punch* for showing on the 30 foot screen at the Polytechnic Institution. As the lenses used in the lantern were not achromatic, it was possible one fault hid the other. He did not think there would be any difficulty in copying a well-printed engraving or woodcut. Mr. Woods said that there was no fault of this kind in copies of copper-plate engravings. He thought the texture of the boxwood on which the woodcuts were made might influence the result. Mr. A. Mackie thought that much depended on the paper on which a woodcut was printed. If a rough paper were used, the ink did not reach the hollows in the grain. The American illustrated periodicals were printed on very smooth, hot-pressed paper, and the impressions were very perfect. Mr. J. Nesbit found that Mawson's photo-mechanical plates were excellent for work of this kind. For making drawings for copying there was nothing better than Stevens' ebony stain; it left a splendid solid black, and dried very quickly. Mr. Foxlee thought wet collodion the best for this class of work. Mr. Richmond said that he obtained good results on ordinary Ilford plates developed with ferrous oxalate and intensified with mercury. He had also found that Mr. Wellington's method of intensifying answered well. He had somewhat modified and, at the same time, he thought, simplified the formula. His modified formula was—

A.—Silver nitrate	... ...	100 grs.
Water	... ...	7 ozs.
B.—Ammonium sulphocyanide	... ...	240 grs.
Water	... ...	7 ozs.
C.—Hypo.	... ...	240 grs.
Water	... ...	7 ozs.

For use, take one drachm of each of the three solutions in the order named, and apply to the plate. He preferred a fairly long exposure.

THE LATENT PHOTOGRAPHIC IMAGE.*

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

THE composition of the material composing the latent image is as yet an unsolved problem. It is generally regarded as being identical with the dark products obtained by the more prolonged action of light, and this view is supported by the fact that they are affected in the same way by many re-agents. Carey Lea's observations (*loc. cit.*) that a brief action of reducing agents on silver compounds produces invisible but developable images, whilst prolonged action produces visible images, and that in both cases the images are identical in behaviour respectively with the invisible and visible latent images produced by light, is also very strong evidence in favour of the same conclusion, but their identity is not yet proved. The resistance of the latent image and of the darkened products to the action of nitric acid render it highly improbable that they consist of metallic silver; and it was for a long time supposed that they were sub-salts of silver corresponding with a sub-oxide Ag_4O, described by the chemist Wöhler. According to this view, the latent image consisted of a minute quantity of silver sub-chloride Ag_2C, or sub-bromide Ag_2Br, or sub-iodide Ag_2I, containing half the quantity of halogen present in the ordinary salts. Attempts to obtain Wöhler's sub-oxide have been made

* Concluded from page 321.

without success by Newbury, Muthmann, von Pfordten, and Bailey and Fowler, and, of course, attempts to make the sub-chloride from it have failed also. The methods used for the purpose of obtaining the sub-oxide were, however, not such as, reasoning from analogy, were likely to be successful. They all depended on the possibility of stopping the reduction of an ordinary silver salt when half the radicle had been removed, without at the same time producing any metallic silver. Even in the case of well-known and stable compounds this is a matter of much difficulty, and when dealing with a substance such as ordinary silver oxide, itself extremely easily reduced to the metallic state, the difficulty of definite partial reduction becomes enormously greater. Moreover, chemists are acquainted with many cases in which the haloid salts of an element are much more stable than the corresponding oxide—the mercurous salts which are analogous to the silver salts afford an excellent example—and, therefore, the non-existence of a silver sub-oxide is no proof of the non-existence of silver sub-chloride, sub-bromide, or sub-iodide. This question remains for further investigation.

Carey Lea found (*loc. cit.*) that by the action of reducing agents, such as ferrous hydroxide, alkaline milk or grape sugar, &c., on silver salts, he obtained products very similar in properties and composition to the dark products produced by the action of light. They are very slowly attacked even by strong nitric acid, but more rapidly by potassium iodide, and are decomposed by ammonia, sodium thio-sulphate, &c., with separation of metallic silver. He regards the two sets of compounds as identical in character, and considers them to belong to the indefinite class of compounds known as "lakes," or, in other words, as compounds of silver sub-salts with varying proportions of the ordinary salts, the compounds having a much higher stability than the sub-salts themselves. In order to recall the mode of formation of the dark products, which vary in composition according to the conditions of their preparation, but always contain less halogen than the normal silver salts, Carey Lea proposes to call them photo-salts of silver; thus, photo-chloride, photo-bromide, photo-iodide, &c. We do not know, however, that these bodies are really "salts" in the usual acceptation of the term; and although the names are very good, it would be better to speak of them more generally as photo-compounds or photo-products.

Hunt stated* that when silver chloride darkens in presence of air and moisture, half the chlorine is replaced by oxygen, and researches by Hodgkinson,† the details of which are not yet published, led him to the conclusion that the darkened silver chloride is an oxychloride of the formula Ag_4Cl_2O, formed from four molecules of silver chloride AgCl. AgCl. AgCl. AgCl., by the substitution of an atom of oxygen for two atoms of chlorine, thus AgCl. Ag. O. Ag. AgCl. Experiments, the details of which have not been published, cannot of course be criticised or properly appreciated; but it is very difficult to believe that a silver oxychloride could form in presence of strong nitric or hydrochloric acid. It is also important to observe that the supposed oxychloride is not a reduction product of silver chloride, but a substitution product, the quantity of chlorine and oxygen in the formula given being sufficient to neutralise all the combining power of the silver. Silver oxide is known to be readily reduced to the metallic state by developers; and if we assume that this reducibility of the oxide is transferred to the oxychloride, which would be the case if the compound had the constitution represented by the formula given, the formation of the oxychloride would certainly explain the production of an image on development. On the other hand, it is equally well known that silver oxide is very readily attacked by acids, and it is not easy to see how an oxychloride could retain the instability of the oxide in presence of reducing agents, and yet offer so great a resistance to the action of acids. If further experiments prove that the darkened products are really an oxychloride and an oxybromide respectively, it is not at all probable that they will have the constitution which has been suggested.‡

It seems quite certain that the presence of oxygen is not essential to the formation of a dark photo-product from a haloid silver salt. Dry silver chloride darkens readily when exposed to light under benzene† or in hydrogen,‡ or apparently in presence of any substance which can take up chlorine, whether the particular substance contain oxygen or not. It is obvious, however, that we are not entitled to assume that the products formed are identical, and the behaviour of a substance out of contact with air and moisture gives no direct evidence as to its behaviour when oxygen and water are present.

It has not yet been definitely proved—indeed, from the nature of the case, absolute proof is almost, if not quite, impossible—that the material composing the latent image is identical in composition with the visible products found by the more prolonged action of light, although the various facts previously referred to furnish very strong evidence that this is the case.

The exact point which we seem to have reached is this, that the latent image is a photo-chemical reduction product containing a lower proportion of halogen than normal silver chloride, or bromide, or iodide, and much more easily reduced to the metallic state; but the problem of its composition and constitution still remains to be solved.

THE PHOTOGRAPHIC SOCIETY OF INDIA.—The steady progress of this Society, as recorded in its journal, is evidenced by the accession of thirty-six new members since January.

THE CAMERA CLUB.—The fifth of the series of photographic exhibitions at the Camera Club will be open on and after Tuesday, May 6th, to visitors on presentation of their cards. The exhibition will consist of photographs by the late Mrs. Julia Cameron, and by the kind co-operation of Mr. H. H. Cameron the Club is able to exhibit a fully representative collection. Amongst other pictures will be the portraits of Sir John Herschell, Lord Tennyson, and Robert Browning, produced by Mrs. Cameron more than twenty years ago. The pictures will be on view for about two months.

A NEW REAGENT FOR PYROGALLOL.—At a recent sugar meeting of the Mulhouse Industry Society, M. Matthieu-Plessy described a new reagent for cane sugar, grape sugar, and pyrogallic acid, consisting of a solution of lead paranitrate ($PbHNO_4$) in an excess of melted ammonium nitrate (*Mon. Scient.*, December, page 1,146). It is prepared by melting 51 parts of ammonium nitrate, and adding to it 34 parts of lead nitrate and 21 parts of lead hydrate. The reagent melts at about 115° C., and in contact with glucose it gives a cherry-red colour; with cane sugar the colour of *café-au-lait*; and with pyrogallic acid a chrome-green colour.—*Pharm. Journ.*

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* "Researches on Light," 2nd ed. p. 80.
† PHOTOGRAPHIC NEWS, xxxi, 371.

* Hodgkinson (*loc. cit.*) and Mellola's "Chemistry of Photography," p. 56.
† Guthrie, *British Journal of Photography*, xxxii, 393; Carey Lea, *American Journal of Science* [3] 38.
‡ Hitchcock, *Amer. Chem. Journal*, xi. 474; *British Journal of Photography*, 1890, p. 8.

A MEETING ABOUT LENS STANDARDS.

The Lens Standard Committee of the Photographic Convention having publicly asked all photographic opticians interested, to meet it at the Mona Hotel, London, to consider the subject of standard diaphragms and flanges, the meeting took place last Friday night. Mr. A. Haddon occupied the chair, and among the opticians present were Mr. T. R. Dallmeyer, Mr. Conrad Beck, Mr. J. Turnbull (Wray and Son), Mr. W. Taylor, Mr. H. W. Hobson, Mr. T. P. Watson, Mr. A. Rayment, and Mr. M. J. Swift.

The Chairman stated that the committee had been appointed at the Birmingham meeting of the Photographic Convention in 1888, to consider the lens standards of the Photographic Society, and what improvements might be made therein. It had previously done a certain amount of work. The results of their deliberations that evening would be brought before the Convention at its meeting this year in Chester. He hoped that the opticians present would be led by the voice of the majority. He could not see why photographers should have to carry about in their apparatus a greater weight than is necessary of wood and brass.

The Chairman then distributed some printed copies of the original report of the Lens Standard Committee of the Photographic Society, as follows :—

"We, the Members of the Committee appointed by the Council of the Photographic Society of Great Britain to consider and report upon the best means of attaining uniformity in the construction of apertures in the 'diaphragms of lenses,' 'flanges,' and 'camera screws,' have now the honour of communicating the result of our investigations. Our aim has been, as far as possible, to combine the nearest approach to scientific accuracy with practical utility. Had either consideration exclusively engrossed our attention, modified recommendations might have resulted. Dividing our Report into three divisions, the first section has reference to 'Lens Diaphragms,' the second to 'Flanges and Adapters,' and the third to 'Camera Screws.'

"*Lens Diaphragms.*—With regard to Diaphragms, we recommend—1st. That the aperture of the standard-unit diaphragm should have a diameter equal to one-fourth the equivalent focus of the lens, and be marked '1,' the approximate equivalent focal length of the lens itself being engraved on the mount. 2nd. That diaphragms with smaller openings should have apertures diminishing in area to the extent of one-half from the unit standard downwards, and be marked successively 2, 4, 8, 16, 32, 64, &c. These numbers would indicate to the practical photographer that if a given sensitive film requires with the unit stop an exposure of one second, the introduction of a smaller one would necessitate an exposure of as many seconds as the numbers marked on it ; in other words, each stop would require double the exposure of the preceding one. Should a lens not admit of a diaphragm with an aperture as large in diameter as one-fourth its focal length, nor exactly any one of the above-mentioned sizes, we still recommend that all the apertures be made in uniformity with the above scale, with the exception of the largest, which should be marked with the number its area requires in relation to the unit diaphragm. In the case of a lens having a working aperture exceeding in diameter one-fourth its focal length, the diaphragm should be marked in fractions (as ·5, ·25, &c.), in uniformity with the standard apertures, according to the sizes of their relative apertures. We further advise that diaphragms required to be made with apertures intermediate to the standard sizes should invariably be marked with numbers corresponding to the ratio of their area to the aperture of the unit diaphragm.

"*Flanges.*—We advise the construction of flanges with internal and external screw threads of a standard series, for attachment to cameras having screw threads adapted for screws, 1½ in., 2 in., 2½ in., 3 in., in external diameter, and made with twenty-four threads to the inch 3½ in. The 3½ inch to have twenty-four threads to the inch on the inside, and twelve threads to the inch on the outside. If larger ones are required, we recommend that they increase in size one inch in diameter, from four inches upwards, with twelve threads to the inch both internal and external. We also recommend the manufacture of a series of adapters, with inner screws made to carry any existing lens, and with outer ones corresponding to the next or other larger size of the standard flanges above described. Hereafter, whenever practicable, the screws cut on the mounts of all newly-manufactured lenses should be suited to one of the above-sized standard flanges.

"*Camera Screws.*—With regard to camera-screw connections, we recommend that henceforth all screws fitted to cameras either for attachment to the stand, for fixing rising fronts, or for other movable parts, should be either $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ of an inch in external diameter, and in pitch of thread and other details in accordance with the generally recognised Whitworth standards for the above-mentioned sizes.

"The Council of the Photographic Society of Great Britain having accepted this Report, have directed that a series of standard flanges and camera-screws be constructed and kept in the custody of the Society, and be called "The Photographic Society's Standards." Upon application to the Secretary, these standard flanges and screws will be shown, and printed copies of this Report be given to those manufacturers of lenses, flanges, and camera-screws who may be desirous of adopting the above standards.

"*The Gallery, 5a, Pall Mall, S. W., July,* 1883."

Mr. W. Taylor said that he thought the fixing of lens standards to rest entirely with the public. To make a change would involve each optician in much expense, so any change must come by the optician feeling that if he is not up to the times, the times will leave him behind. His firm used the standards of the Photographic Society, and did not see that there was any advantage in making a change, for to change a system of lens fittings meant a change of all patterns, the abandonment of old stock, and involved other losses, which few opticians would voluntarily agree to make. Interchangeable screws on gas-pipes are one thing, and lens screws are another ; the latter are far more difficult to make, and many of the standard microscope screws in the market are not so well made as would please a good mechanic. They exceed the proper limits of error. In some of them he had found an error of $\frac{1}{100}$ of an inch, and that was a serious thing. If any society wished to alter the present system relating to photographic lenses, steps would have to be taken to provide members with standard gauges, and the means of correctiug those gauges when they began to wear. He thought the Whitworth thread to be good and suitable for lenses. Some photographers wished bayonet fittings for their lenses ; such fittings were liable to become unsteady ; the turning of them out was not convenient to the lens maker, and they were far more difficult to make interchangeable. The lens screws adopted in the system of the Photographic Society are coarse, and this to some extent meets the requirements of the man who wants a bayonet joint to save time. His firm so made their lenses that any number of them would screw into the same flange upright, and this was a subject which should be considered when dealing with interchangeable fittings. The gauges for making the screws should be true to $\frac{1}{10000}$ of an inch.

Mr. Conrad Beck remarked that in the cutting of standard screw threads for the microscope, the point of the tool wears, so causes an inaccuracy at the bottom of the thread, which in other parts is of the right size ; therefore special means have been devised for afterwards cutting out the surplus metal at the bottom of the thread.

Mr. M. J. Swift did not think a little shake in the screw of a lens mount to be worth considering at all ; the mount is not particularly faulty if it holds tight.

Mr. T. R. Dallmeyer did not think that any optician individually would go to the unnecessary expense of altering the whole of his system. He thought that any standard adopted should be universal, and not confined to England alone. The French Photographic Conference had done well to invite persons from other countries to meet and discuss this question of lens standards, for diaphragm apertures are not wanted only for England, but for every country. He had first suggested the decimal system for lens apertures, and the decimal standard

seemed to have been taken up by the French; indeed, he thought that it would be taken up universally. The Conference did not take up exactly his standard, but Dr. C. Fabre, who was a great authority, considered his (Mr. Dallmeyer's) standard to be better than that adopted by the French. Had he been at the meeting, he should have suggested the ratio for apertures of one over the root of ten, instead of one over ten. The tendency of the times at home and abroad is towards the decimal system, and he thought that that system should be employed for lens stops. He thought that a bayonet guage would be convenient and valuable, but that they should have a screw bayonet catch, and not a pin bayonet catch. He also thought that they should follow up what had been done by Continental scientific men, and that a system based upon the English inch would not be likely to become universal.

Mr. W. E. Debenham hoped that the Committee had had the French report, from which it appeared that the English Society's standard had never been mentioned at the Paris Conference. That Conference had considered and rejected Mr. Dallmeyer's standard of *f* over ten, but had adopted the decimal standard. Lens mounts made according to the standard *f* over four of the Photographic Society are now largely made and sold, so the fact should have been brought under the notice of the Conference. He did not see why a good and exceedingly convenient standard, once made and adopted, should be thrown aside without very strong reasons. Very likely the decisions at the last International Conference might be thrown aside when the Conference meets at Brussels.

Mr. Dallmeyer said that one over the root of ten was "the" decimal standard, and that one over ten was "a" decimal standard.

Mr. Arthur Rayment was then invited to speak by the Chairman, and replied that he came to listen, and not to talk.

Mr. T. P. Watson said the same.

The Chairman then read the following letters :—

Dear Sir,—We, as manufacturers and dealers, find that the standard flanges $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, &c., with the Whitworth threads, are generally approved of, and almost the first question buyers put now is, "Are these standards?"

Charles Reynolds & Co.

72 and 73, Fore Street, London, E.C., April 25th.

Dear Sir,—I regret very much that a very important engagement, of which I was unaware when you honoured me with a call, will not allow me to attend the discussion this evening.

If I had been able to attend, the points I should have pressed would have been these:—

1. That all flanges should be made in progressive sizes of $\frac{1}{4}$ inches, as 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and so on.

2. That a universal pitch of thread be used for flanges having an aperture up to $2\frac{1}{2}$ inches, viz., a pitch of 18 threads per inch.

My reasons for the above propositions are :—

In regard to No. 1.—That as many makers have issued a large number of lenses having flanges of varying apertures, and threads of varying pitches, it would become quite easy for any maker to manufacture adapters that would screw on to all existing lens mounts, so as to make them fit a standard flange.

In regard to No. 2.—The screw pitch I have chosen is technically known as $\frac{5}{16}$ Whitworth, or $\frac{3}{8}$ gas. The screw chasers for working these threads can be obtained at almost any decent tool shop, and being a Whitworth pitch, is almost universally used. The depth of the thread being only $\frac{1}{32}$ of an inch, it also admits of fairly light flanges being used without the danger of the bottom of the threads being cut right through the body of the flange.

Again regretting my inability to attend, I am, yours truly,

David W. Noakes.

Billingsgate Street, Greenwich, London, S.E., April 24, 1890.

Mr. Conrad Beck thought the questions before the Committee to depend largely upon an arrangement between manufacturers. Could they, by meeting, arrange any system mutually satisfactory? In the matter of aperture dimensions he did not think that they should agree. As regarded lens-screws, he did not think that so much accuracy as in microscopic apparatus was necessary, especially with the majority of cameras at present in use. The great difficulty in the way of adopting standard flanges is, that at present there are a great number of flanges in the market which they would still have to make lenses to fit after new flanges had been adopted. In any new system the flanges now employed should be utilised as much as possible, rather than that fresh ones should be stamped; therefore it seemed desirable to ascertain what flanges are now mostly in use. After a time the tendency would be for the public to come gradually to the standard sizes.

Mr. William Bedford remarked that before the Photographic Society framed its system of standard apertures, the late Mr. Dallmeyer had a standard system of his own; but when the Committee of the Photographic Society met it obtained little assistance from professional opticians, who were not represented as they should have been. The Committee fixed on the standard of *f* over four. He thought that too much might be made of the decimal system, because when the sizes of stops are once fixed, the practical photographer does not want to know what their dimensions are; indeed, the change to *f* over the root of ten would be of no value whatever to the professional photographer. As regarded flanges, the Committee of the Photographic Society did not consist of first-rate mechanics, but it satisfied itself what the diameters should be. He agreed with Mr. Taylor, that this part of its report might be improved by additional definitions. If the Convention had standards made, opticians, perhaps, would have no difficulty in getting similar standards made by the same firm. He believed that Mr. Dallmeyer would find that this system has come too late, because the system recommended by the Photographic Society has spread, not alone in this country, but throughout America and largely in Continental Europe.

Mr. Dallmeyer thought that in selling lenses it would be well to state the intensity ratio every stop represents; such information ought to be conveyed.

Mr. F. A. Bridge remarked that stops were not always made accurately.

Mr. Taylor said that some opticians took into consideration the fact that the light is condensed by the front lens of a doublet. He had not suggested that lens screws should be accurate to $\frac{1}{10000}$ part of an inch, but that the standard gauges should be so made.

Mr. Beck said that if the committee would decide upon the sizes, the matter of making the lenses interchangeable might be left to opticians, because the Whitworth standards in ordinary use are available.

Mr. A. Cowan stated that when Whitworth made the standard gauges for the Photographic Society, it was understood that he was also ready to make them at any time for opticians.

Mr. Dallmeyer then moved the following resolution :—

"That this meeting recommends that a meeting be called of as influential a body as possible of manufacturing opticians, to decide upon the most convenient series of sizes for standard flanges and camera screws that shall be most suited to meet existing conditions of their manufacture. These standard flanges at present to be limited in number, and, when decided, to report to the Committee of the Photographic Convention of the United Kingdom. It is also suggested that the question of means for their adoption be decided upon. That this meeting be called for the 9th of May, at this hotel at seven o'clock."

Mr. Conrad Beck seconded the motion.

The Chairman remarked that the question of standard diaphragms was of much less interest to photographers than that of standard flanges. He should be glad if opticians would bring their lenses, and compare dimensions.

Mr. Conrad Beck thought that all the lens makers in this country might be invited to state on what system they graduated their stops.

Mr. Dallmeyer's motion was then carried unanimously.

The Chairman then successively took the votes of the meeting as to whether it preferred for lens apertures the ratio of *f*

over the root of ten, *f* over ten, or *f* over four, and those present voted almost unanimously in favour of *f* over four.

The meeting was then adjourned for a fortnight.

Last Tuesday, the Chairman of the Committee sent the following circular letter, on behalf of the Committee of the Convention, to a number of opticians :—

"Dear Sir,—I am directed to forward to you the enclosed resolution passed at a meeting held on the 25th inst., at the Mona Hotel, Henrietta Street, Covent Garden, and to solicit your co-operation. The next meeting will consist almost exclusively of opticians, and, in order to facilitate matters, it is desirable that you should bring details of internal diameters of flanges, number of threads to the inch, and any other details you can furnish in connection with the attachment of all classes of photographic lenses to cameras as now issued by your firm.

A. Haddon, *Chairman of the Lens Standard Committee.*
Royal Naval College, Greenwich, S.E., April 29th, 1890."

THE PERMANENCE OF PHOTOGRAPHIC PRINTS.

BY PROFESSOR H. FOL.

Prints on albumenised paper are so well known, and have been so often spoken of, that it is not necessary to revert to this subject. Those who buy, and those who sell such prints, know well enough how long they last; the preference given to this process, therefore—a preference especially remarked in the smaller towns, and among the lower classes—can only be attributed to the force of habit, or the absence of taste. It is different in the case of those photographs called permanent, which are now made by very different processes. This assertion of permanence is as admirable as it is in the case of the reproduction obtained by means of fatty ink in the press, as well as of those produced by photo-engraving, collotypy, and phototypy. There remain, therefore, but three principal methods to be investigated: the bichromatized gelatine (carbon) process, the platinum process, and the gelatino-bromide and gelatino-chloride of silver process.

An image may change in three ways :—

1. The dark portions may fade.
2. The background may become darker.
3. The print may leave the support.

It is well known that albumenised paper combines these three objectionable features.

The carbon process suffers from the third of these troubles. The image is simply stuck to the support, and although a separation is not of frequent occurrence, it is not possible, however, to guarantee that it will not occur. This same trouble is again found in Woodburytypy, or in the collodio-chloride of silver process. In platinotypy, neither separation of the film nor weakening of the image is to be feared, but rather a darkening of the background, as it is impossible to entirely prevent the penetration, into the body of the paper, of the solutions containing iron and platinum. In truth, the iron salts may, however, be entirely removed by careful washings with water containing a little chlorhydric acid; in this connection there can be no danger, except for want of care. It is not the same thing with the platinum salt. This last possesses the disagreeable property of entering into a combination so resistant with the gelatine or the resins with which most of the papers are sized, that no acid washings can remove this combination. Such papers containing platinum acquire in time a yellowish-green tone, which completely spoils the primitive image. It is not necessary, however, to wait several years to ascertain if platinum prints will yield to this danger. To make sure of this, place the image in water containing sulphuric acid, and allow it to remain twenty-four hours, as Pringle has recommended; if the paper contain chloride of platinum, it will then show a rather dark yellow tone. It is rather difficult to find, among dealers, papers free from this objection. It is unnecessary to insist on the fact that all platinum paper should be prepared with arrowroot, and *not with gelatine.*

Among the numerous photographers who use this process, there are but few who take this precaution, and who, consequently, can attach much importance to the permanence of the platinotypes found in the trade? How can it be otherwise, since the Platinotype Company, of England, founded by Willis, exclusively uses paper prepared with gelatine?* The public is ignorant of the technical side of the question, and judges the whole process from some specimens that have already become green. It would be very desirable if photographers and amateurs were able to prepare by their own hands the true platinum paper. The magnificent labours of Pizzighelli and of Hübl would enable them to do this without difficulty, if Pizzighelli would only complete his information on the preparation and the quantitative analysis of iron solution, so that a professor of chemistry were not the only one able to understand them.

As regards the gelatino-bromide and the gelatino-chloride of silver processes, they seem to fill, or to be able to fill, the three conditions of permanence—provided, however—

1. That the gelatine film is solidly attached to the paper.
2. That the iron contained in the developer has been completely eliminated by the acid washings.
3. That the image has been sufficiently fixed in the hyposulphite.
4. That the hyposulphite has been completely removed by a thorough washing.

These four conditions met, the developed silver salt prints may offer the best assurance of permanence. The thing presents itself rather differently with the gelatino-chloro-citrate of silver prints (aristotypes) that have not been developed. Most of the prints that have been made within a few years have, doubtless, kept well, even in their fine details, but some of them show, here and there, yellow spots. It would be necessary to make more extended investigations to determine if the trouble comes from an insufficient elimination of the hyposulphite, or if the prints, without defects in their preparation, would still be liable to the reproach of want of permanence.—*Revue Suisse de la Photographie.*

The Leeds Photographic Society.—The president of the Leeds Photographic Society is Mr. Thomas W. Thornton; vice-presidents, Messrs. Thomas Dawson and C. H. Bothamley; librarian, Mr. T. Butterworth; hon. treasurer, Mr. G. H. Rodwell; the hon. secretary, Mr. S. A. Warburton, 9, Banstead Terrace, Roundhay Road, Leeds; and the committee, Messrs. Godfrey Bingley, F. W. Branson, W. Denham, E. H. Jacob, and the officers of the Society. The following are its arrangements for the remainder of the year:—June 5, "Sources of Pleasure in Landscape," Mr. Thomas Dawson; July 3, technical exhibition; Aug. 7, outdoor excursion; Sep. 4, "Demonstration on Alpha Printing," The Ilford Company; Oct. 2, "Watchwords for Workers" (picture choosing and picture making), Mr. Atkinson Grimshaw; Nov. 6, open lantern exhibition in the Albert Hall: Dec, 4, "Some Photographic Art-Notes," Mr. Frank Kidson, and annual meeting.

* The Platinotype Co. carefully avoids the use of paper containing gelatine.—Ed.

PHOTOGRAPHIC LENSES.*

BY THOMAS R. DALLMEYER.

PHOTOGRAPHIC lenses in general are optical systems for the formation of real images. The perfection of the image, its exact resemblance to the object, and its distinctness, will depend on the exact conveyance of all the rays of pencils emanating from every point in the object into strict mathematical points in the image, or the nearest approximation to such points as may be. If aberration is present, due to improperly chosen curvatures, or improperly combined materials, the resulting image will lose in its distinctness, and may become useless. The object, then, in constructing lens systems is the best possible destruction of aberrations, both chromatic and spherical. With this in view, we have to consider: first, the proper selection and perfect homogeneity of the materials employed; secondly, the best selection of curves ascribed to the material; and thirdly, mechanically, a strict maintenance of the "figure" (as it is technically termed) of the curves when the material is properly polished. As it will not be possible in the time allotted to this paper to touch on the mechanical processes employed, I will mention here that this, of course, is a very important consideration.

Glass is a very perfectly elastic substance, and if in the processes of sticking the glass on to polishers the material becomes "biassed," however perfectly the curve may then be polished, the glass, on being released from the polisher, will spring back, and the true curve will no longer be maintained, and will give rise to an unexpected appearance in the image technically termed "unnatural" aberration. Similar effects occur from bad workmanship in polishing, the polish not being distributed equally. Such defects are quite inadmissible, for although not visible by ordinary reflection, the polish appearing very good, a critical examination of the image will show the deleterious effect.

In the application of photographic lenses for ordinary purposes, we ask the instrument to do practically what is theoretically an impossibility. An imaginary perfect lens can only truthfully depict one plane at a time, every other plane being out of focus; when, however, the lens is used under conditions that all rays coming from points in the object are so situated that they are practically parallel; or the circles of confusion in the plane of the image, when removed from the plane for parallel rays, are so small that they are undistinguishable from points visually, the general appearance is one of uniform sharpness. In ordinary lens construction the rays are usually considered as parallel; but in large portrait lenses the means should be given, if sharp images are the theoretical desideratum of correcting the spherical aberration introduced for nearer planes.

There are great advantages, you will be aware, from rapid lenses or brilliant images. Herschell points out that the brightness of an image is proportional to the quantity of light which is concentrated in each point of it; and, therefore, supposing no aberration, as the apparent magnitude of the lens which forms it, seen from the object $\times \frac{\text{area of object}}{\text{area of image}}$. Or, since the area of the object: that of the image :: (distance)^2 of object from lens: (distance)^2 of image; and since the apparent magnitude of the lens seen from the object is as its $\left(\frac{\text{diameter}}{\text{distance of object}}\right)^2$, the brightness or degree of illumination of the image is as the magnitude of the lens seen from the image alone, whatever be the distance of the object. Now the apparent magnitude of the lens seen from the image is always much less than a hemisphere. Therefore (leaving out the loss of light by reflection and refraction), the illumination of the image is always much less than that of the object.

I mention these facts at the outset for the reason that you may clearly understand that it is quite impossible for the lens with a large ratio of aperture to focus, or one that aims at attaining a maximum brightness of image (such as are used in portraiture), also to maintain, at the same time, the uniform qualities above referred to in a lens, the ultimate employment of which is to depict, with sufficient exactitude or definiteness, objects in different planes. With the decrease of brightness, or aperture, comes a reduction of the angle at which the extreme rays cross, increasing thereby the limits through which the plane of the plate may be moved for similar diameters of out-of-focus circles; but, as the depth increases by the proportion, the diameter of the lens is diminished or stopped down, the brightness decreases as the square of the intensity ratio, or the ratio or aperture to focus. As the ultimate applications of various optical systems are at the outset understood, a knowledge of geometry and analysis will enable the optician to construct different forms that shall be particularly suited to the end to be attained.

I take it for granted that you are all acquainted with first principles and first approximations in the refraction of light at plane and spherical surfaces, and are familiar with the fact that the different coloured rays of which white light is composed are unequally refracted in their passage through a refracting medium, giving rise to chromatic aberration.

As stated before, our effort is, as far as possible, to destroy in the final image of every system the aberrations arising from spherical forms of the lenses and chromatic aberration. The process necessary to destroy the latter being the easier defined, we will approach it first, and return to the headings.

1.—*The Proper Selection of Materials.*

It is well known and easily demonstrated that a single lens cannot be made free from either spherical or chromatic aberration for parallel rays. (A study of the different forms of single lenses and their adaptability to different photographic purposes is very interesting and instructive, and we will run through them briefly when on the subject of spherical aberration.) If, however, we combine two or more lenses of different media, we have the means of annihilating both aberrations simultaneously. The elimination of chromatic aberration is rendered possible by the property of refracting substances of dispersing colours in a very unequal degree, though the difference in the refractive power is comparatively slight.

Taking the D line of the spectrum as brightest visually, and the G or H line as that of the most chemically active rays, in order that a lens may be of value in photography—or be actinic—it is most essential that these lines be combined, whatever may become of the rest. Thus, two lines can be combined with two different kinds of glass, and n lines may be of course combined by employing n different kinds of glass.

For example, take Chance's ordinary hard crown glass, the refractive index for line D = 1·517116, and for the

* A paper read at the Society of Arts last Wednesday night.

line G, 1·528348; for dense flint, for line D, 1·622411, and for line G, 1·646071. The difference, then, between these lines is, for the crown glass, ·011232, and for the flint, ·023660. The dispersive power of the flint between these particular lines is more than twice as great as that of the crown.

Now, you know that if a number of lenses are placed in contact (supposed infinitely thin), the focus or convergence of system is equivalent to the algebraical sum of the components of the system. It can be shown for two kinds of glass, such as the above; the chromatic aberration can be destroyed, or actinism (the coincidence of chemical and visual foci) be maintained; the glasses must be unequally dispersive, one convergent or positive, and the other divergent or negative. The system can be made free from chromatic aberration, and convergent if the lens formed of the less dispersive power is positive, and is divergent if the lens formed of the less dispersive power is negative. In every case the ultimate rays from the lens converge to form a real image, so that (unless in the lens-system a negative element is introduced as a corrector) it will be found the positive element is always composed of the less dispersive medium.

Recent improvements in glass manufacture necessitate the expressions of "positive" and "negative" elements in lens systems, instead of the flint and crown, and to these I am about to refer. My late grandfather, in a paper contributed to this Society on "Practical Illustrations of the Achromatic Telescope," says of glass then known: "The flint is easily distinguished from the crown by its superior specific gravity, arising from the quantity of lead which enters into its composition. Thus, the glass which is called flint glass has, in fact, a smaller proportion of silica than crown. It obtained this title from the care employed in selecting the flint with a view to the purity of the glass, and the term has since become so extensively adopted as to be now almost European." Again, "discs of homogeneous flint glass, more than four or five inches in diameter, are exceedingly rare, and very costly." The advances in the art of glass-making have been very great since that time. By the skill and enterprise of Messrs. Chance, of Birmingham, Pfeil, of Paris, and most recently the elaborate work of Professor Abbe, assisted by Messrs. Schott and Gen. of Jena, the means at the optician's disposal is now placed in a much more satisfactory position.

(To be continued.)

Photographic Society of Philadelphia.—At the meeting of the Society on April 1st, the chairman announced the sudden death of their President, Mr. Frederick Graff, which occurred on Sunday morning, March 30th. For nearly thirty years his official connection with the Society had been continuous—as chairman of the meeting called to organize the same, then as vice-president, and serving two terms as president. He was indeed regarded as its father. To his untiring zeal for its welfare the Society is in a great measure indebted for the high position it holds in the photographic world. At the meeting on April 2nd, the following minute was adopted and ordered to be published, after which, out of respect to the memory of their deceased president, the Society adjourned:—"The members of the Photographic Society of Philadelphia desire to testify to their sense of the great loss they have sustained in the death of their President, Frederick Graff. They feel that by his death not only have they lost a most efficient presiding officer, but that each one has been bereft of a dear friend, a sage counsellor, and one who gave of his very best to promote the interests and well-being of the Association."

THE SOCIETY OF ARTS.

Last Wednesday night, at a meeting of the Society of Arts, under the presidency of Capt. W. de W. Abney, F.R.S., Mr. T. R. Dallmeyer read a paper on "Photographic Lenses" (see page 344). In the course of the lecture, he exhibited a cemented double-concave lens, which gave a positive focus, because of the optical properties of the three glass elements of which it was composed.

Mr. J. Traill Taylor, upon being invited to speak by the Chairman, said that he would rather see the discussion taken up by members of the Society of Arts who did not make optics a special point, as the meeting might then be of more interest to them.

Mr. W. E. Debenham was glad of the tribute which Mr. Dallmeyer had paid to Professor Petzval, whose optical achievements had enabled photography to make great advances in the days of slow processes, and he was sorry that Steinheil's name had not been mentioned, for the lens Steinheil invented had been more adopted by photographic opticians than any other. He did not think that any improvement had been made in the portrait lens by the late Mr. Dallmeyer's modification; the Dallmeyer lens had certain advantages, but, balancing one thing against the other, his admiration of the work of the late Professor Petzval was as great as ever.

Mr. J. T. Taylor asked, in connection with the nodal points of Gauss, and in the case of a rapid rectilinear lens, from what point in that lens should distant rays be measured? He asked the question because he thought that theory and practice did not quite agree in the matter. Carey Lea placed the point between the combinations, but nearer to the back lens than the central position. Could Mr. Dallmeyer tell them how to cure the sweating of glass? He had a lens which was in the constant habit of getting damp. Someone had recommended boiling it to remove the hygroscopic constituent from the surface.

Mr. Conrad Beck said that the focus of a doublet should be measured from a point slightly nearer to the back than the front lens. The focal length could be ascertained by the use of a very thin single lens placed so as to throw an image of a distant object so that it shall be of the same size as the image thrown by the double lens. Most of the Jena glasses useful to photographic opticians will not stand the action of air, but the new glasses open up an enormous field of optical research, and their properties require a vast amount of investigation before their utilitarian value can be known.

Mr. L. Scott said that paragraphs had been published in newspapers about Jena glass giving the power of making lenses with both surfaces flat or nearly so, yet with the power of converging or diverging rays of light. Was that true? He had found that he could make more rapid exposures, sometimes to the extent of twenty-five per cent. quicker, by cutting off the yellow rays from his lens by means of a glass trough containing a dilute solution of ammonio-sulphate of copper.

Mr. Dallmeyer remarked that he had not much to which to reply. Mr. Traill Taylor knew the answer to his own question about measuring the focus of doublets, and had published two methods in his own paper, whilst he (Mr. Dallmeyer) had published therein a third. Dr. Hopkinson had done something to get rid of the sweating of glass. The only effectual way was to sandwich such glass by cementing it between pieces of other glass which did not sweat. By using only blue light with lenses, the screen cut off the green and other rays in white light which otherwise would act upon the plate; he thought it best to use the whole of the light available, and not a part thereof. In reply to Mr. Debenham, he was proud of the advances his (Mr. Dallmeyer's) father had made in optics, whatever opinion others might have about them.

The Chairman, when measuring the focal length of a double lens, preferred to employ a pinhole rather than a thin single lens; the pinhole must be so placed as to give an image of the same size as that thrown by the doublet. The distance varies when the focussing has to be done over a near instead of a distant object. He had had some little experience with Jena glass, and had found that it would not bear the atmosphere at all. Some time ago he required for a special purpose a lens

in which rocksalt should form a part, and a friend made him such a lens sandwiched; that lens was made five years ago, yet is perfect at this day, notwithstanding the hygroscopic properties of rocksalt. Ammonio-sulphate of copper solution cut off many of the rays which are active photographically, so he was surprised to hear that it shortened the exposure. He could understand it if the operator were using iodide of silver, because the red and yellow rays have a reversing action, and the plate would be protected therefrom by the blue screen; without such protection they might undo some of the work done. An increase in exposure might, perhaps, with iodide of silver, be obtained to the extent of one or one-and-a-half per cent, but not twenty-five per cent. He should not like to recommend anyone to try the blue screen method, except for experimental purposes.

Patent Intelligence.

Applications for Letters Patent.

6,028. P. RUDOLPH, 47, Lincoln's Inn Fields, London, "Photographic Objectives."—April 21st.

6,029. E. ABBE and P. RUDOLPH, 47, Lincoln's Inn Fields, London, "Photographic Objectives."—April 21st.

6,066. B. JUMEAUX, 17, St. Ann's Square, Manchester, "Photographic Developers."—April 22nd.

6,081. W. WEIR, Miligaire, Stirlingshire, "Invention for Reflecting Objects in the Background," to be known as "The Detective."—April 22nd.

6,093. J. MERRITT and W. E. SPENCER, 77, Chancery Lane, London, "Cameras."—April 22nd.

6,101. G. CASTAGNINO, 76, Chancery Lane, London, "Apparatus for Distributing, Diffusing, or Reflecting Light."—April 22nd.

6,143. S. P. READ, Ivy Bank, Etherow Road, East Dulwich, London, "Postal Case for the Preservation of Drawings during Transmission."—April 22nd.

6,147. A. DRUMMOND, 70, Wellington Street, Glasgow, "Glazing Structures."—April 23rd.

6,173. W. P. THOMPSON, 6, Lord Street, Liverpool, "The Reproduction of Drawings or the like." (Raoul. Sanson, and Amédée Wilbaux, Belgium).—April 23rd.

6,221. J. W. LOVIBOND, 53, Chancery Lane, London, "Instruments for Estimating, Measuring, or Comparing the Colours of Transparent or Opaque Bodies, and for Testing Colour-Vision and Light-Perceptive Power."—April 23rd.

6,233. A. PUMPHREY, 128, Colmore Row, Birmingham, "Stereoscopes."—April 24th.

6,239. H. M. HASTINGS, 54, Edith Road, West Kensington, London, "Apparatus for Ascertaining the Distance of any Object for Photographic Purposes."—April 24th.

6,247. C. R. BONNE, 41, Eastcheap, London, "Apparatus to be used in the Development of Photographic Negatives." (Eduardo Casal, France).—April 24th.

6,259. J. MAKEPEACE, 37, Chancery Lane, London, "Glazing Roofs."—April 24th.

6,294. W. H. STACEY, 18, York Street, Sheffield, "Dark Slides for Cameras."—April 25th.

Specifications Published.

3,103. *March 4th*, 1890.—"Machines for Applying a Coating of Mucilaginous Substance." CHARLES HUDSON and JOSEPH SPOOR HUDSON, 3, Langdale Terrace, Stockton-on-Tees, Cardboard Box Makers.

This invention relates to a machine to be used for spreading a coating of gum, paste, glue, or other mucilaginous substance to the underneath side of paper, cardboard, and the like, and to the delivery and transit of the said coated article to some place where it is required for use or placement, and also for cutting the said paper when such cutting is necessary, as in the case of wall papers, or for narrow strips for cardboard box makers.

The inventors claim:—

1. The use of endless strings in grooves around the coating roller, for the purposes described.

2. The combination of a pasting roller for coating paper at the underneath side, with endless carrying bands.

3. The combination of a coating roller for coating paper at its underneath side, with means for turning the paper the coated side uppermost.

4. The combination of a mucilage roller for coating paper at its underneath side, with endless take off strings, and means for turning the paper the coated side uppermost.

5. The combination of a coating roller for coating paper at its underneath side, with means for turning the paper the coated side uppermost, with carrying apparatus.

6. The combination of cutting apparatus with coating roller.

7. An apparatus for cutting strips of paper, and roller for coating the same, with means for taking the paper off the finishing roller, and carrying it away; also for turning it the coated side uppermost, substantially as described and shown.

Correspondence.

THE CRYSTAL PALACE CHALLENGE CUP COMPETITION.

SIR,—The Newcastle exhibitors complained that some of their pictures were excluded from the Challenge Cup Competition, and I thereupon immediately checked off, by their list and the catalogue, every picture as hung in the three alcoves set apart for them. *Not one was missing*, but, in addition, two of those which had been previously shown at the Crystal Palace were included. As, however, no mention of the disqualification of those two, or of any others, was made to a single judge, it is not easy to see how the presence of two additional pictures was prejudicial to the interests of the Newcastle Society.

The entire number of the Newcastle pictures—Mr. Sawyer having substituted two new for two old ones—was submitted to the judges for their consideration, and the responsibility of the Executive was then and there brought to an end.

J. F. PEAGOOD.

Crystal Palace Company, Crystal Palace, S.E., April 26th.

THE PHOTOGRAPHIC CONVENTION.

SIR,—The fifth annual Photographic Convention will be held at the Town Hall, Chester, on June 23rd to 28th inclusive. The proceedings will be opened by a *conversazione*. During the week, papers by eminent authorities will be read, and an exhibition of novelties in photographic apparatus will be held. Sub-committees appointed to consider the questions of lens standards, and weights, measures, and formulæ will present reports.

Excursions to various places in the neighbourhood have been arranged. The scenery around Chester is universally acknowledged to be exceedingly picturesque and beautiful, and replete with historical interest, and it therefore presents unusual attractions to the photographer.

The annual subscription is 5s., and admits to all the privileges of membership. Members who desire to read papers or give demonstrations are requested to forward their names at an early date. A detailed programme will be forwarded as soon as final arrangements are complete.

The council trust that the good work already done by the Convention will commend it to your support, and they hope to have your assistance in increasing the number of its members.

J. J. BRIGINSHAW, *Hon. Sec. and Treas.*

ON Thursday, May 8th, there will be an exhibition of lantern slides at the Camera Club, from negatives recently taken by Mr. J. R. Rodgers and Major Nott in Egypt, and by Mr. H. M. Elder in Madeira.

PHOTO-MECHANICAL PRINTING.—An article published in this journal last week about photo-mechanical processes was quoted from *The Beacon*, of Chicago, the mention of which circumstance was omitted in error. Shortly, a series of articles on the same subject, by a writer experienced in photo-mechanical processes, will appear in these pages.

Proceedings of Societies.

Photographic Society of Great Britain.

The technical meeting of this Society was held on Tuesday evening last, the 29th ult., Mr. T. Sebastian Davis in the chair.

A kodak of larger size than those previously exhibited was shown by Mr. Jackson. The camera was made to take a roll-holder having forty-eight films of size 7 by 5, and when fitted for use weighed five pounds and a quarter. The diaphragm plate was in the form of a quadrant pivoted at the angle. Many film negatives that had been taken with the apparatus were handed round, and the chairman enquired what method of development had been employed.

Mr. Jackson said that he had used pyro and ammonia for some, but for the most part the negatives had been developed with pyro and a mixture of potash and soda.

The Chairman asked whether Mr. Jackson had used quinol.

Mr. Jackson replied that the action of quinol was too slow. Great density could be got with it if it was desired. In developing these films it was necessary to carry on the action until the image was almost gone, as it lost so much in the fixing bath.

Mr. Arnold Spiller enquired whether Mr. Jackson had found any method of varnishing satisfactory.

Mr. Jackson had not succeeded with varnish. For drying the films he used in the first place a bath of methylated spirit, glycerine, and water. After a short stay in this solution the films were pinued up by a corner to dry, and when dry were rolled with the films outwards and kept so for about a couple of hours.

Mr. Spiller thought the use of glycerine introduced the danger of taking up silver from the paper used to print on.

Mr. Jackson said that the glycerine could be removed from the surface of the films by wiping them when dry with cotton wool. The films were made in various speeds ; those used for the negatives now shown were of about twice the rapidity of the stripping films.

Mr. Friese Greene showed a film about 20ft. long, with a series of negatives on it. For developing such long strips he used a dish in which several glass rods were fixed horizontally at a little distance from the bottom of the dish. The film was wound in and out of these rods, and the dish waved during development.

Mr. Spiller had been able to get very dense negatives on celluloid films by using eikonogen in conjunction with caustic potash or soda. The films being very hard, would stand strong alkali better than most emulsions.

Mr. W. England showed some negatives taken on thick celluloid films.

Mr. T. Samuels thought films of this substance much better than the thin ones previously shown, which were very difficult to develop.

Mr. W. E. Debenham pointed out the advantage of thin films when collotype or other mechanical processes were to be employed.

Mr. Spiller had found no difficulty in developing thin films.

Mr. Jackson said that the method he used was to place about a dozen films, one on the top of the other, in the developing dish. They were kept face downwards, and moved, as in toning prints, by taking up the bottom one, and laying it on to the top.

Mr. W. England showed an arrangement for holding a celluloid film in a dark slide of larger size than the film itself. Three strips of thin card were glued on to a thick card in such a way as to go round three sides of the film to be used. On these strips were other strips, overhanging the film for a distance sufficient to ensure holding it in. He also showed a sheath made with a card back, and furnished with edges of ferrotype plate, under which the edge of the film was slipped.

Mr. A. Cowan showed some plates illustrating the effect of orthochromatising ordinary plates. He first showed a pair of plates, one of which had been orthochromatised and exposed for a minute under a negative at a window covered with four thicknesses of yellow material. There was found to be a fully printed transparency on development. The companion ordinary plate similarly exposed showed but a very faint image. The sensitiveness of the orthochromatised plate for ordinary daylight was, however, much diminished, as was shown by a pair of negatives and by plates exposed under a sensitometer screen. The action of the yellow had been much exalted, whilst the general sensitiveness was lowered. It had been said that there was great difference of orthochromatic effect as the daylight was bright, or inclined to be yellow. In exposures, however, that he had made at 12 o'clock in the day and at 7 in the evening, he had not been able to discover any relative difference in the sensitiveness of the orthochromatic and ordinary plates.

Mr. W. E. Debenham considered that Mr. Cowan's experiments showed conclusively the efficacy of the orthochromatising solution that he had employed. He noticed a strong pink colour still left in the plates, much stronger, he thought, than would be the case with any commercial plates.

It was mentioned that the subject of stereoscopic pictures and apparatus would be brought forward at the next technical meeting, to be held on the 27th of May.

Camera Club.

April 24th.—Capt. W. de W. Abney in the chair.

Mr. T. R. Dallmeyer, in continuation of his paper on "Limitations in the Treatment of Subjects by Focus," said that he did not pretend to any more knowledge of art than was included in any educated man's curriculum with a taste for the fine arts. He had been criticised for entering upon points outside the limits of the province of an optician. He had, however, endeavoured to show the tendencies of the focal treatment of subjects, starting with that of sharp focus, which of itself was a mathematical triumph, and had then indicated the instrumental possibilities outside this treatment to produce results more in accord with the artist's taste. "Sharp all over" photographs are truer *in drawing* than those of contrasted definition. Major Nott had taken up the opposite position to Mr. Davison, perhaps rather extremely. He (Mr. Dallmeyer) did not agree with the general statement of Captain Abney, that a photograph sharp all over is seen in parts with the same amount of "fuzziness" as in nature, when the eye is directed chiefly to the principal object, and when the photograph is of large size, say 20 by 15, with a focal length of lens of 30 inches. In fact, this must entirely depend upon the distance of the nearest plane included. Binocular vision will make this distance greater than monocular vision, as portrayed by the photographic lens. The artist, Mr. Davis Cooper, had had the misfortune to lose the sight of one eye, and had arrived at the definite conclusion that, within a distance approximating closely to sixty yards, there is an alteration in the focus of the eye for different planes, becoming more striking the nearer the planes approach to the eye : beyond that, no appreciable difference exists ; this, of course, may vary with different eyes. In Capt. Abney's case, if the nearest plane were 2,000 inches distant, uniform definition through all planes must obtain, and to get uniform sharpness in nearer planes, the lens must be more and more stopped down. If the eye were focussed in the nearer plane chosen, it would have a different focus than for those most distant, and this does not so nearly approach to the handling by an artist. He (the speaker) thought knowledge of the "sight-stop" for extreme distance to be of value to the artist, as the largest stop he should employ. More stopping down introduces "local colouring," making the photograph too topographical to be called artistic ; the focus of the lens should rest where the eye wishes to rest, and give the picture desired by the individual. Mr. Davison was surprised at his statement of what was and what was not art, but mere mechanical excellence, he (the speaker) fully admitted, will pall upon people, and those who too much advocate it will be left "hoist with their own petard." Although his views might not be serviceable to him commercially, and might be misinterpreted as departing from a scientific and mechanical height, he, for

one, elected to go forward, in order that a still wider application of lenses *per se*, perfect mathematically, might, by intelligent use, serve the double purposes of the two extremes of artistic and scientific requirements.

London and Provincial Photographic Association.

At the meeting on the 24th inst., Mr. W. H. Prestwich occupied the chair.

Mr. T. E. Freshwater exhibited a book of silver prints of Chester and neighbourhood by Mr. G. W. Wilson, of Aberdeen. Mr. Freshwater thought it might be interesting to the members of the Photographic Convention visiting the next meeting at Chester.

The Hon. Sec. showed a lantern slide of Burnt House Farm. The negative was taken last September, previous to the landslip. He also passed round a case of photographic enamels by Lafon de Camarsac and Joubert, the property of the Photographic Club, presented by Messrs. F. Haes and A. Cowan.

The exhibit gave rise to a discussion as to the relative merits of the powder and substitution processes.

Mr. A. Cowan said the powder process had the advantage of simplicity, and the results, in his opinion, were certainly equal.

Mr. W. H. Harrison remarked upon the condition of the ancient enamels at the British Museum, the enamel of many of these being cracked in several places. He considered this might be due to the unequal expansion and contraction of the metal support and the enamel under the influence of changes of temperature.

Mr. T. E. Freshwater showed the silver prints referred to at the previous meeting that had been packed for several years in a tin case. It was found that some of the prints were quite perfect, others having faded.

The Chairman said that from his experience, he believed silver prints made on ready-sensitised paper were more permanent than those made on freshly-prepared paper. It was difficult to understand why a batch of prints produced under the same conditions were not always all equal in permanency.

The Hon. Sec. exhibited some results in copying pictures with ordinary and isochromatic plates. In one case there was a marked difference in favour of the isochromatic plate. In the other instance—the subject being a water colour with purple sky, and same colour reflection in the water—it was generally considered that the ordinary plate gave the best result. In one of the prints there was a vast difference in the rendering of a small cloud in the picture.

Mr. W. E. Debenham said he had used collodion on his lens and an eosine bath with excellent results; with one maker's ordinary plate he had used a yellow screen with good effect.

Photographic Society of Ireland.

A technical meeting of this Society was held on Thursday evening, 24th inst., at 15, Dawson Street, Dublin, Mr. Greenwood Pim in the chair.

A joint paper on "The Utility of Hand-cameras on Tour," by Mr. M. Hedley and Dr. J. Alfred Scott, was read by the latter, and slides of pictures taken in Scotland last year by the authors were exhibited by means of the lantern, and were much admired. After the paper,

The Chairman asked Dr. Scott what proportion of exposures, time or instantaneous, were the best?

Dr. Scott, in reply, said that only 18 out of 169 plates exposed were time exposures, and that they invariably turned out very good. In reply to Dr. Cosgrave, Dr. Scott said that his lens was a cheap French R.R., with full aperture of *f*/6: but he found that *f*/12 gave a general "all-round" focus, and told better for transparencies.

In reply to Mr. Strangways,

Mr. Hedley said that he used one of Lancaster's "Instantographs," placed in a common pine box, with Lancaster's ordinary revolving shutter.

The Chairman then exhibited Ferrero's film carrier; Fallowfield's detective camera was shown by the Rev. Canon Bagot; Shew's "Eclipse" camera by the hon. sec.; and Dr. J. A. Scott exhibited a hand camera of his own manufacture, based on Rouch's model.

Answers to Correspondents.

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

Amateur.—*Inside Painting of Studio and Dark Room.* Provided you select a light tint it is almost a matter of indifference what shade of colour you adopt; probably pale blue or stone colour would be most suitable for the studio, and in certain cases one might be disposed to give a top coating of luminous paint to show a light throughout the night. The dark room should be painted No. 1 chrome yellow.

J. D. (Glasgow).—*Truncated Bellows for Camera.* Following the directions in the Year-Book for 1889, pages 173 to 180, it would be quite easy to make a pattern first in cartridge paper, and settle the measurements for a 12 by 12 bellows in this way before cutting out your material. We admit the figures in the plates and explanatory drawings are not very intelligible, but most of them can be read by a lens.

J. D. (South Shields).—Your Ligroine lamp ought to find a ready sale at cost price. Offer it by advertisement. A second letter duly received this week.

Antiquary.—*Roman Baths in the City of Bath.* Enquire of Mr. A. F. Perren, Milsom Street, who took several photographs, both of the square and round baths, when they were first opened.

B. C.—*Botanical Photography.* Your question is answered, and other points of detail referred to, in Julius Sachse's admirable article in last week's News, page 322. Begin at once, or you will lose the earlier phases of development.

K. Schwier (Weimar).—Is thanked for sending further details of the Voigtländer, Festge, and Kindermann competitions, medals and money prizes to be given at the forthcoming (August) meeting, in Eisenach, of the German Photographic Convention. The general particulars are incorporated in the prospectus appearing in our pages this week.

F. C. S.—*Chlorine Water Actinometer.* Professor Alexander Pedler, of Calcutta, has investigated the action of sunlight upon chlorine water, with the result that he found oxygen escaping with effervescence; but he does not go to the length of asserting that the measure of the oxygen collected is a true photometric indication of the intensity of the solar radiations. The equation $2H_2O + 2Cl_2 = O_2 + 4HCl$ was established in the main, but there are secondary changes resulting in the production of hypochlorous and chloric acids, which detract from the amount of free oxygen disengaged during this reaction. The ultimate change is, however, more complete when dilute solutions of chlorine are employed, so that further experiments are required for the purpose of fixing the limit at which the chemical decomposition of water by chlorine becomes a reliable measure of the actinic force.

A. L. (Otago, N.Z.)—*Benzoline Saturator.* Having read the account to which you referred us, we cannot suggest any cause for the failure of the apparatus, but should be inclined to blame the benzoline. It would be well to interpose a Mangham jet, or cylinder plugged with copper wires, and capped at both ends with copper or brass gauze, to overcome the risk you encountered by the flame passing back. You might then find it advantageous to warm the benzoline saturator, for it is evident that you had an excess of oxygen. Having already an ether vapourizer, you might try the ethobenzene light, which is highly recommended in the same account.

H. T. L. (Westport, N.Z.)—*Staining of Negatives whilst Printing.* Gelatine negatives are much more difficult to protect than collodion, on account of their greater prominence. In a damp climate you should print them with a plate of tale between, as is often done with valuable negatives here in England.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1653.—*May* 9, 1890.

CONTENTS.

AN INTERNATIONAL PHOTOMICROGRAPHIC EXHIBITION IN ANTWERP.

A COMMITTEE has been formed to organise an International Exhibition in Antwerp, devoted to microscopical science in all its branches, on the occasion of the third centenary of the invention of the microscope. The Exhibition will be divided into two sections, the one retrospective, the other a display of microscopes by actual makers, also accessory apparatus and photomicrographs. During the Exhibition lectures will be delivered, illustrated by means of the photo-electric microscope, and among the subjects included will be:—"The History of the Microscope," "The Use of the Microscope," "The Projection Microscope and Photomicrography," "The Microscopic Structure of Vegetables," "The Microscopic Structure of Men and Animals," "Microbes," "The Adulteration of Food and other Substances."

The Executive Committee consists of M. Charles de Bosschere, *President*; Dr. Henri Van Heurck, Director of the Botanical Garden of Antwerp, *Vice-President*; M. Charles Van Geert, jun., Vice-President of the Floral Circle of Antwerp, *Secretary-General*; and M. Edmond Grandgaignage, Director of the Superior Institute of Commerce, Antwerp, also M. Gustave Royers, Chief Engineer of the City of Antwerp, *Members*.

The Executive Committee says that it is unnecessary to state the importance of the microscope, for without it none of the natural and medical sciences could have reached the altitude at which they stand to-day; without it we should not know the structure of plants, of men, or of animals, and the modifications which take place in our tissues under the influence of certain diseases would be unknown. Several diseases which the presence of microbes enables us to detect at an early stage, would otherwise be mistaken for unimportant maladies of another character. Without the microscope forms of life innumerable would remain unknown to us; take, for instance, the infusoria, the diatoms, and the bacteria. Numerous adulterations of articles of commerce, which are now detected with ease by means of the microscope, would otherwise remain undiscovered. But why continue this long enumeration? Suffice it to say that without the microscope we should not now be better instructed in the natural and medical sciences than were our fathers one or two hundred years ago.

The Committee adds that the compound microscope was invented by Hans and Zacharias Janssen, of Middelburg, and the researches of Professor Harting result in assigning the date of 1590 to the invention, which date is admitted by competent authorities. For a long time the inherent defects of the compound microscope forced students to make general use of the simple microscope, until about 1824, when Charles Chevalier finally established the compound microscope by the union of two brilliant ideas, the combination of isolated achromatic lenses in a compound objective, and turning their plane faces towards the object. In the previous year, 1823, Chevalier conceived the happy idea of superposing achromatic lenses in the microscope of Selligue. The Committee concludes by saying that the project of celebrating in 1890 the third centenary of an invention which has produced a veritable revolution in the scientific domain will receive, without doubt, the sympathetic approbation of all men of science, as well as of the great army of amateurs now "passionately" engaged in research carried on with the aid of the microscope.

Such is the original scheme of the Committee; but a few days ago, Dr. Van Heurck told us that its carrying out is postponed until next year. The City of Antwerp has promised to subscribe fifty thousand francs towards the Exhibition, and to give the use of a building for its purposes, in which building four thousand square metres of space will be available. The Government of Belgium was fully expected to subscribe fifteen thousand francs towards the undertaking, but at the last moment it declined, and as the Committee wants another fifteen or twenty thousand francs to carry out its plans, the Exhibition is postponed until 1891. The idea is to keep the Exhibition open for three months, July, August, and

September, we presume for the benefit of tourists who pass backwards and forwards through Antwerp in such numbers in the autumn. Antwerp is one of the favourite landing-places in Europe of American tourists, many of whom book there direct from New York, and year by year the number of English passing through Antwerp is increasing, by reason of the good accommodation provided of late years on the Harwich route, combined with moderate fares. The general public cannot be expected to wax enthusiastic over photo-micrography, although brilliantly illustrated lectures may help to rouse them from their torpor; neither can it be expected that skilled microscopists could make it convenient to be in Antwerp on or about a particular fixed date, hence the keeping of the Exhibition open for a long time is more likely to meet their requirements. Zeiss has expressed his interest in the Exhibition and willingness to exhibit therein.

On the occasion of the opening of public exhibitions, the reception of visitors by the city of Antwerp is usually of the most hospitable character. Some of us will not soon forget the receptions given by the venerable Burgomaster and others at the inauguration of the Antwerp International Exhibition several years ago.

PHOTOGRAPHERS AND CROWDS.

Crowds, especially of street boys and street girls, have been the deadly enemies of architectural photographers for all time, and many have been the devices for clearing an open space in front of the camera. One of the most time-honoured is that of mounting a large lens at the back of the camera to draw the crowd in that direction, whilst the view really desired is taken by the small lens in front.

A few days ago two English photographers planted their cameras on opposite sides a deserted space in Ghent to take an adjacent church; instantly, of course, children dropped from the clouds, emerged from the earth, concentrated from all possible directions, and each operator had his crowd around him. One of them folded his arms, leant against a wall, and gazed steadfastly at his friend in the distance; the children soon grew tired of gazing at an operator doing nothing, then cleared off to watch the more active manipulator; the first one, thus relieved, then made his exposure.

The same day, when taking another view, one of these photographers discovered that a boy in the crowd prided himself on his dancing; that boy was immediately offered the sum of one penny to dance several yards behind the camera. The delighted boy entered into the contract, and executed a kind of Belgian "fling" which drew the crowd to the back of the camera. The view was then taken.

In the old cities in Belgium and Holland architectural photographic work is somewhat more easy than in towns in England, because there are so many canals and rivers about. For this reason numerous picturesque views are obtainable when the lens is pointed over the parapet of one or other of the bridges.

THE ROYAL ACADEMY OF ARTS, 1890.

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

We have been so long accustomed to be told that "the Academy this year is certainly not up to the average," that it will be quite refreshing, for once in a way, to omit that time-honoured enigma, for it is by no means an easy thing to reply to the obviously pertinent question, What do you mean by the average?

It is not an unnatural presumption that the readers of these notes are for the most part interested in the making of pictures by some of the various photographic processes of the day, and their interest in the pictures now on view in Burlington House will concern them chiefly for such degree of sympathy as the aforesaid paintings will conjure up in the photographic eye.

The writer has little or no sympathy with that type of cynic who is blind to all aspects of criticism save that of fault-seeking—finding or inventing which has but little benefit in it beyond flattering the vanity of the defect discoverer; but, on the other hand, rather with him who

> "Finds tongues in trees; books in running brooks,
> Sermons in stones, and good in everything."

There are but few, if any, pictures in this vast gathering from which nothing may be learned, if even it be what to avoid, what not to do, or how not to do it, although there are vast differences in the lessons, as in the long scale of tones and subjects of nature herself; yet it is always a lasting and solid consolation to the humblest follower of Art in nature that she has yet secrets which he has just as good a chance of discovering as any other user of human eyes, and be his nugget small, yet so long as it has the ring of truth, he may take to himself the consciousness of having added to the wealth of the world.

The number of works included in the catalogue is, perhaps, somewhat less than in some recent years; but probably, if the cream be less in quantity, it may be compensated for by its quality.

Perhaps it may be as well at the outset to state that the following remarks are not an attempt at what is usually termed art-criticism—which is too often but an ill-matched patchwork of ignorance, flattery, smartness, and art cant—but rather an attempt to suggest to my photographic friends what is worth while their seeing for themselves, so that they may *think* for themselves also.

Gallery No. 1.—No. 4 ("The Loving Cup," Seymour Lucas, A.), is rather of the sharp-all-over sort, a crisp picture, and suggestive in its arrangement of secondary detail. No. 5 (by G. A. Storey, A.R.A.), "The Hungry Messenger" is its title, and the hero of the act the messenger himself, a half-starved Puritan, having delivered his missive to a Roundhead commander, accommodates his appetite from his neighbour's plate, an incident of a somewhat comic nature, which is enhanced by the earnest look on the reader's face.

Simple and natural incidents are such as, perhaps, best lend themselves to photography, and thus this picture may suggest a new direction to some one for a subject-picture through the camera.

At this end of the room, rather high up, are two studies of lions' heads (No. 7, "The King of Beasts," P. H. Fisher, and 94, "Duke," P. G. Cooper) which strongly remind us of some shutter pictures taken in the Zoo, not long ago; also No. 8 ("Bosom Friends," a couple of dogs, by C. P. Garland), all show what important part photography is destined to play in pictures of "objects in motion,"

"lively" subjects generally. In No. 9 ("The Broken Pitcher," C. G. Hards) we have a favourite incident which is becoming classical; it would seem as though no exhibition is complete without it. No. 18 ("Dinah Morris Preaching," C. Gregory) is an admirable subject for the study of pose and grouping; note the man in background, the critical semi-defensive angle of his legs. No. 19 ("The Cast Shoe," R. W. Macbeth, A.) purchased by the Chantry Bequest, reminds one strongly of some place not a hundred miles from Cambridge; the inn sign "five miles from anywhere and no hurry," has a familiar sound. Note how the man holding the horse connects the two groups of figures and leads up to the theme, and how the one secondary small figure at the side looking at the spectator carries one's eye into the picture at once.

Somehow we do not take kindly to No. 20 ("A Daughter of the Ghetto," Luke Fildes, R.A.); it seems to bring to our mind the word "retouching." Before leaving this corner, take a glance at No. 14 ("Lilies," Blanch Jenkins), a child's head lighted from the back, and note the luminosity of the face in shade. Try this lighting at various angles in the studio: *verb. sap.* Passing on to No. 25 ("The Moon is up, and yet it is not Night," Sir J. E. Millais, R.A.), we have a masterly hand, familiar to all in portraiture figure, giving us a landscape well worth careful study. The photographic eye says, "nothing is in focus except the stag's head, and that isn't very sharp;" but stand back a yard or two, and if there isn't "focus," there is *air, breadth, simplicity, quietness*; a ground fog just creeping up in the distance. Perhaps the somewhat regular band of undergrowth, arranged somewhat like an arc of a circle of which the spectator imagines himself the centre, is not quite satisfactory—nevertheless, a picture; a lesson in tone and the power of simplicity. Close by, No. 26 ("La pia de Tolomei," Edwin Long, R.A.) is one of the figure studies which this artist has taught us to expect. The various ornaments, decorations, designs, symbols, &c., on the breast seem to rather distract one from their number and sparkle. The hands are worth studying. Just at first No. 30 ("The Revenge," James Kay) calls to mind Turner's "Fighting Téméraire"—a vigorous conception, and boldly carried out, if, perhaps, with a somewhat lavish hand in strong colour.

No. 31 ("Homewards," E. A. Waterlow, A.) must surely bring to mind many a spoilt plate—many an attempt (and failure) to catch the bright gleam. In looking at No. 36 ("By Quiet Waters," J. E. Grace) one is tempted to say, "Try another cloud negative." The sky seems too fiery for the title, or the subject, and gives one an impression that it does not belong to the rest of the picture. No. 40 ("His Playthings," K. Earle) reminds us of many a photograph where an attempt is made to "make a picture" by just collecting a few odd "properties" and "getting them all in." The clouds, again, in No. 43 ("The White Mill," David Murray) seem to come too forward—seem much nearer than the mill sails, in fact. And again in No. 57 ("Moorland," C. H. H. Macartney) the clouds don't seem "to belong."

No. 59 ("The Young Duchess," H. Schmalz). It seems a pity to have put "patches" on such a sweet face, and given such a twist to the neck, that one's admiration melts into sympathy for the sitter's discomfort—"Eh! surely?" And, again, the English face in the Japanesque get-up in No. 65 ("A la Japonaise," Mary Groves) seems to appeal chiefly to our consciousness of the general *un*fitness of things generally.

No. 66 ("A Florentine Fruit Shop," P. W. Adam) is an apt illustration of another kind of unfitness of things. We like softness, even "out of focus," at the proper time and place; but the accepted definition of that ugly word, "Dirt," shows us that there is "a place for everything"; and we don't somehow feel thoroughly satisfied in our minds as to whether those yellow objects are oranges or balls of wool.

In No. 67 ("First Words of Love," C. E. Perugini) we think that it would have been better if *one* of the two were a little more like speaking, and not both apparently in considerable doubt as to "what to say next." The Romeo-and-Juliet theme seems a never-failing one; perhaps such ideal themes may justify idealisation of treatment.

No. 68 ("A Placid Morning," H. W. B. Davis, R.A.), takes us to open air again. What we like best is the transparency and luminosity of the shadows on the cattle, and one bit of the foreground water: but the sky and distance do not make us feel the "palpitating air of early dawn."

No. 69 ("Polo," J. C. Dollman) brings to mind the question as to whether it is desirable to represent violent action in works of art, and again, if so, whether the "critical moment" is the best one to select. We do not affect a knowledge of horse-flesh or anatomy, and therefore will be content with saying that some of the animals seem in "funny" positions; but here we must call in Mr. Muybridge as our court of final appeal as to the possibilities.

Nos. 74 and 80 ("Augustus Holden," and "Sir D. A. Smith," by W. W Ouless, R.A.), we have two very suggestive portraits, both well worth study. The fur in No. 74 is particularly "furry," although *every hair* is not painted singly as some would insist upon.

No. 73 ("Good Luck," Lyell Carr) certainly does make one feel cold, although the sun-cast shadows on the snow cheer one somewhat.

No. 76 ("All Hands Shorten Sail," F. Brangwyn). This is a picture to be well looked at, but we will defer saying more until we come to others by the same artist.

No. 81 ("Davy Jones's Locker," W. L. Wyllie, A.) certainly upholds the view that there are "as good fish in the sea, &c.," and at this particular point they seem to be more than plentiful.

No. 75 ("Last Night's Disaster," J. C. Hook, R.A.) must not be passed over. The figures at work digging out the sand from the tide-cast boat certainly strike us as the best part. The sky and sea both seem hard, and not inviting of attention.

No. 82 ("A Foretaste of Summer," L. C. Nightingale) comes as a note of warning; too many horizontal and vertical lines are not often pleasing, and we could have imagined the swans a bit more feathery. No. 86 ("The Fringe of the Forest," F. S. Richardson) is fuzzy enough to satisfy the pin-holiest of pin-hole advocates; and No. 88 ("Across the Common," Claude Hayes) is also, as Mrs. Gamp would put it, "likewise so disposed."

No. 89 ("Snakes," Estelle d'Avigdor). There are several of these weird semi-mysterious dark pictures this year. We should have liked this one better had we been more satisfied about the bit we took to represent a patch of open sky, up in one corner.

No. 91 (Portrait, by W. Carter) is well worth careful looking at; excepting the colouring, we like it. The pose is easy and natural, balance of the head is good, and the

hands are easy; generally, the treatment is broad and simple, and its simplicity gives it weight.

No. 96 ("Among the Brambles," Val. C. Princeps. A.). We don't quite know whether to look at the brambles, or the young ladies, or the small boy who is staring at us, and so we feel constrained to pass on into the next gallery.

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

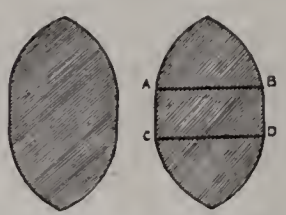
Death of M. Peligot—Bridal Medal—Photographs in Colours — Exposure Shutters and Chromo-Photographic Apparatus — Pellicular Films on Celluloid — Photo-Collographic Process — Halation — Coloured Screens — Instantaneous Photography.

At the opening of the meeting the Chairman announced the death of M. Peligot, president of the Society, and read the discourse which had been pronounced over his tomb at the funeral. Peligot was a great chemist. Although he had never devoted himself especially to photography, he not the less rendered service to this science, in which he was greatly interested. It is not yet known who is to succeed M. Peligot as president of the Society, but we have some reason to believe that it will be M. Janssen, who is a member of the Institute, as were Messrs. Regnault, Balard, and Peligot. It is a tradition of the Photographic Society to place itself under the highest possible scientific patronage by calling to the presidency a member of the Institute. No choice, moreover, could be more acceptable than that of M. Janssen, whose work in astronomical photography has been of such great importance.

On the occasion of the marriage of the daughter of the grand nephew of Nicephore Niepce, the Bureau of the Photographic Society made an offer of one of the medals struck on the occasion of the celebration of the fiftieth anniversary of photography. The medal bears the effigies of Nicephore Niepce and of Daguerre.

Photographs in colours, by M. Veresz, of Koloszvar, were shown at the meeting. Much has recently been said and published concerning these productions; notably in the Photographic News interesting articles have appeared, especially that by Capt. Abbey in the last number. We had expected to see something better than those examples which were exhibited, which add nothing new to what is already known on the question, except that they are on glass, and obtained with gelatine emulsion. We are certainly not amongst those who absolutely deny the possibility of the solution of the problem of photography in natural colours, no one having the right to say to science, "Thou shalt go no farther," but we may certainly affirm that the interesting researches of M. Veresz have not yet led to this solution so ardently desired.

General Sébert has made two very interesting communications. One relates to a method of studying the action of photographic exposure shutters. The apparatus employed for the purpose was shown. In this apparatus the effective work of the shutter registers itself. It is the application in practice of a method indicated by M. De Labaume Pluvinal at the time of the Congress. The apparatus consists of a kind of dark slide forming a camera, in the interior of which slides a light board worked by two springs. In front there is a circular opening closed by a metallic plate, across which is a very thin slit. If a piece of sensitive paper is placed on the thin board, and the whole is exposed to a powerful light whilst the board is moved by the springs, the various zones of the sensitive paper passed behind the slit, and if the light is equal throughout, its action is translated on the sensitive film by a continuous tint. On the contrary, if during the passage of the paper there are irregularities in the source of light, these irregularities will show themselves by inequalities in the zones on the paper. If it is desired to try an exposure shutter, it is placed in front of the opening, and by using a bifurcated tube we act simultaneously on the release of the board bearing the sensitive surface and on that of the shutter. At the same time a tuning fork is released, vibrating 100 to the second, and carrying a small hole at the upper end to allow light to pass. On the corresponding part of the sensitive paper a sinuous line is produced, each bend of which indicates the one-hundredth part of a second. We have thus simultaneously a graphic delineation of the work produced by the shutter, and of the time occupied. The line varies, according to the nature of the shutter. Those with vanes opening from the centre to the circumference, and closing from the circumference to the centre, without stopping, give an impression in the form of a lozenge with curved sides. But



if there is a stoppage—that is to say, an instant when the objective is left fully open—the figure takes the form shown—that of the preceding one, plus the rectangle ABCD inserted in the centre portion of the curvilinear lozenge. AC, BD, have a length corresponding to the duration of the full opening of the lens. With other shutters the forms are different, but analogous to the one described, the work with full aperture being always indicated by a rectangle in the centre of the field. On comparing various shutters with this apparatus, we find which is the one that, with the same duration of total action, gives the largest amount of work with full opening, and this is evidently the one which should be preferred. The sinuoidal trace gives the exact duration of each part of the exposure, and we have thus automatically registered the various phases of action. The idea of the registering tuning fork attached to this apparatus was given by M. Cornu.

The other communication, by the same author, relates to an apparatus for reproducing an object in movement at equal intervals regulated in advance; these intervals may be varied according to the requirements of the case. It is composed of six cameras furnished with shutters, which are acted upon successively by two needles carried on a rotating disc; the first needle opens each shutter, and the second closes it. The operation is performed in the fraction of a second, so that we can obtain the photographic registration of the various phases of the movement of a projectile, a torpedo, &c. The spring movement is supported independently of the cameras, in order to avoid shaking.

M. Grieshober showed some new pellicles of gelatino-bromide of silver on celluloid. The sheet of celluloid bears two coats of gelatino-bromide—one on the front, and one on the back; by this means halation is avoided, and, if the impression is divided between the two surfaces, the negative may be used on either side. Some of these pellicles were distributed among the members for experiment.

M. Balagny summed up his process of photo-collography

on pellicle covered with gelatino-bromide of silver. The coating of gelatine is attached to its pellicular support by a silicated solution. It is sensitized by bichromate of potash, and printing is carried out in the customary way. It is washed in the usual manner, and placed on a flat surface, where adhesion takes place by vacuum. The printing with fatty ink is effected in the usual manner. In short, the characteristic of this process is the use of flexible supports, gelatinized beforehand, and photo-lithography allows us to pull a certain number of impressions from each plate. We do not see the use of the bromide of silver, and we believe that an identical—or, perhaps, better—result would be obtained on gelatine alone. M. Balagny thinks that the silver increases the sensitiveness of the film. We have made the following experiment: A piece of Eastman's paper was freed from bromide of silver at one end by immersion in hyposulphite of soda; it was then washed, and the whole sensitized with bichromate of potash. After exposure to light, we could find no difference in the sensitiveness of the two halves. The use of bromide of silver appears to us so far to be a simple luxury without any advantage. M. Balagny proposed to practically demonstrate his very interesting process at a technical meeting of the Society.

The question of halation has been stirred up anew. We have observed that the remedy proposed by M. Cornu is not practicable on account of the non-drying nature of the essences he mentioned. Collodion with chrysoidine alone is not sufficient, a negative showing halo obtained when using this method having been shown by us. Finally, we have shown a negative without the slightest halation obtained on a plate the back of which was covered with collodion containing chrysoidine, to which was added another tinctorial substance in order to absorb almost all rays, methyl violet Further, as our experiments were made on Monckhoven orthochromatic plates, and through powerfully coloured screens, it is shown that neither orthochromatism nor the use of screens is a remedy against halation. The best remedy is a collodion which dries quickly, and is so coloured that all rays are absorbed. *Apropos* of coloured screens, we mentioned our experience with a continuating screen. An orthochromatic plate is exposed in the camera in the usual way with a suitable yellow screen; it is then exposed to light under a combination which only allows red and orange light to pass. The supplementary exposure is about four or five times as long as the camera exposure, but will vary according to the nature of the continuating screen. On development, the red is found to have acquired its proper value. With plates sensitised for red, the use of the continuating screen is still necessary, but for a shorter time. In connection with this subject, we also showed our sensito-colorimeter: but it would take too long to describe it now, and we shall return to it later.

M. Joseph Vallot indicated a process of photographing grottos by the aid of magnesium. He uses a lamp which allows two grammes of magnesium powder to be blown through at once. A good flash of about two metres in height is produced, and in this way he has been able to reproduce very successfully details of certain interesting grottos in Le Herault. M. Vallot showed conclusively by lantern projections the success he had obtained in the way indicated.

The Newcastle Photographic Exhibition will close to-morrow (Saturday) evening. At 7.30 p.m. there will be a vocal and instrumental concert in the building.

THE ROYAL INSTITUTION.

CAPTAIN ABNEY ON COLOUR.

Last Saturday afternoon, Captain W. de W. Abney delivered a lecture on the above subject, and began by remarking that he had previously explained to them how he measured the amount of blackness of a silver or platinum deposit by means of a rotating disc, and that the amount of blackness of deposit can be shown to scale. From any particular blackness the intensity of the light which produced it can be ascertained; when he had a variety of blacknesses he could compare them, and say that such and such an intensity of light produced each, so that it was really a quantitative process of measuring the chemical action of light. He had discovered that the deposit followed the curve of the law of error.

The law applies not only to platinum deposits, but to anything whatever reduced by the action of light; for instance, the fading of indigo follows the same law, but is so long in fading that a longer unit of time has to be selected. In the case of the fading of carmine, a convenient unit of time is one hour, and in the case of indigo six hours. In ordinary photography the units of time are changed, for when the light is feeble and the lens stopped down, they do not count by seconds, but by hours. For each pigment there are certain rays which are chemically active. Experiment shows that the intensity of light is interchangeable with length of exposure, yet a very small change can be measured by the spectrum method he had brought under their notice; for instance, it had been ascertained that the first change in carmine is the fading of the blue element it contains. The phosphorous oxide recently discussed at the Royal Institution by Professor Thorpe changes in the light first to yellow and then to red. People have taken it that the amount of apparent change shows the exact sensitiveness to light, but this is not the case: the observations had to be referred to the curve in the diagram before them, to learn the absolute sensitiveness to any part of the spectrum.

Captain Abney here exhibited some colours which he and another had exposed for eighteen months to the action of light, and said that month by month they had taken portions of those bands of colour, and measured them one after another by the method he had described. There are, however, some pigments with which it is impossible to deal in this way, because they take so long to fade; rose madder only begins to fade after the lapse of eighteen months, and medical men have not yet found out how to prolong life sufficiently to finish the experment with that substance.

The sum of the effects produced by the different rays is the same, whether the same rays act together or at a different time. This is perfectly true as a rule, but there are exceptions. There are rays of the spectrum which tend to undo, or mask, the effect of the other rays; the red will mask the work done by the blue ray, so that if the red is made to act upon a sensitive surface before the violet, the result is not the same as if they acted together, because, in the first case cited, the red has nothing to undo. In ordinary photographic work, the rays which undo the effect produced by the other rays may be neglected, as the influence is so feeble under the conditions. An image in red light may be projected upon a screen illuminated by white light, and a photograph of the red image be obtained, because the red rays undo some of the effects of white light by oxidising the film.

Captain Abney then photographed an image of the spectrum after passing the rays through green glass; he used bromide of silver paper, and developed by means of a brush. On the same sheet he also photographed the spectrum without green glass interposed. The result was that the green glass was seen to have cut off both ends of the photographic spectrum; the image produced subject to its intervention was shorter and feebler than that produced by the spectrum of white light. The lecturer said that if the effect of blue light upon a bromide of silver film be taken as one hundred, that of green light will be about twelve. On these principles the photographic intensities of light passing through coloured glasses could be measured.

The spectrum value of a sensitive salt can be increased. If a salt of silver be stained with certain fugitive dyes, the salt is increased in sensitiveness to those particular parts of the spectrum which the dye absorbs; a lake is formed in the first instance, and this gives nuclei upon which development can take place. He then showed the results of photographing a colour sensitometer by means of an ordinary plate and by means of an orthochromatised plate: he also exhibited photographs of a doll dressed in various colours, to show the results obtainable by different methods. The best result was obtained by illuminating the doll with mixed green and yellow light, then photographing it on a plate which had been treated with erythrosine and cyanine; in this experiment, the blue of the spectrum was, it will be noticed, eliminated.

He exhibited two photographs, upon silver plates, of the spectrum in natural colours, and remarked that the colours, though not strong, were clearly discernible. Such photographs, he said, were not new, but had been taken for forty years.

If three colours be taken, which, together, make white light, it is perfectly possible, by superposing them, to get what, to the eye, appear to be all the colours of the spectrum. He then, by mixing red, green, and violet rays, produced white light, and afterwards, by mixing them in another way, obtained a good representation of a complete spectrum upon the screen.

A photograph in natural colours, he said, was not due to the colours of thin plates. At present it appears to be highly improbable that photography in natural colours will ever be of commercial value. Colour is mostly produced under red light by an oxidation process, and by oxidising, the molecule becomes of such a shape as to reflect red light. Violet light has a reducing action; in fact, he had sometimes produced white, by red and blue undoing the action of each other. Thus one end of the spectrum tends to undo the work of the other end. The investigator on photography in natural colours, whose work is now attracting attention, is simply repeating the experiments made years ago by Mr. George Wharton Simpson. If once a man succeeds in completely solving the problem of photography in natural colours, he ought to make a fortune first, and be hanged afterwards, for the discovery will be the destruction of all art feeling.

The Photographic Club.—Subject for May 14, "Photographic Definitions"; May 21, "Photo-Mechanical Processes."

Photographic Society of Great Britain.—Ordinary Meeting at 5A, Pall Mall East, on Tuesday, May 13th, at 8 p.m., when papers will be read on "Reflected Images in Optical Combinations, and their Effect on the Brilliancy of the Final Image," by T. R. Dallmeyer; and on "Photography with a Flash-Light," by W. England.

AN EXHIBITION OF MRS. CAMERON'S PHOTOGRAPHS.

An Exhibition of Mrs. Cameron's photographs was opened at the Camera Club last Monday, and highly deserves a visit from those who have been brought into photographic existence by the ease of the modern dry plate processes. To the older photographers the pictures are not new. The portraits by Mrs. Cameron are a powerful argument in the mouths of those who are adverse to excessive sharpness of focus in photographs: they are artistically beautiful in the highest sense, and some of them so resemble in style portraits by the old masters, that it is difficult to realise that they are not orthochromatic photographs of ancient paintings. One of the most striking portraits is that of the late Sir John Herschel, a pioneer in scientific photography, and a former contributor to these pages. Another is a likeness of Mrs. Cameron herself, with square-cut features, and an expression of spirituality and kindliness.

On Monday evening, Mr. Davison, in drawing the attention of the members to the pictures upon the walls of the Club, said that the task was a pleasant one, and that Mrs. Cameron was an enthusiastic worker; in putting up the pictures he felt that it would be easy to wax enthusiastic about them himself. Some of them contained eccentricities which had better have been left out, but in the main they must recognise the wondrous force of her portraits; she had seized the leading characteristics of each face, and had delineated them as could have been done better in any other way. She had advantages, for she mixed with artists, and she had models whose heads lent themselves to pictorial effect. The disadvantages of the time in which she worked were very great. She lived in the wet collodion days; her studio was a fowl-house converted for the purpose, and in that way she obtained her magnificent dark backgrounds for portraits. Sir John Herschel was an astronomer, and in his portrait there is appropriately something star-like in the disposition of the hair. Some female heads, from life, in the collection show wonderfully the characteristics of the pre-Raphaelite school. He felt it to be scarcely possible that the character of Thomas Carlyle could have been rendered with more force than in his portrait before them. The public are only now learning to appreciate the work of Mrs. Cameron, and he ventured to predict that they would see much more work of the same kind before many years had passed away. She publicly exhibited her works but rarely, and then, as is often the case, was not satisfied with the judges' awards. Among those who wrote to her about her photographs, sent to some exhibition, was a German, who sent to her the following letter, evidently aided in his literary work by a dictionary:—

"Mr. —— announces to Miss Cameron that he received the first half a pound note, and took the photographies as Miss Cameron wishes. He will take the utmost sorrow* to place the pictures were good.

"Mr. —— and the Cmitié regret heavily† that it is now impossible to take the portfolio, the rooms are filled till the least winkle.‡ The English Ambassade takes the greatest interest of the placement of the photographies of Miss Cameron, and Mr. —— sent his extra ordinarest respects to the celebrated and famous female photographs.

"Your most obedient."

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* Care, which was the word needed, is expressed by "Sorgen" as well as sorrow. We invert the sentence, and we read, to have the picture well placed where the light is good.

† Regret heavily, severely, seriously.

‡ Winkle is corner in German.

She also once received the following communication :—

"Miss Lydia Louisa Summerhouse Donkins informs Mrs. Cameron that she wishes to sit to her for her photograph. Miss Lydia Louisa Summerhouse Donkins is a carriage person, and therefore could assure Mrs. Cameron that she would arrive with her dress uncrumpled.

"Should Miss Lydia Louisa Summerhouse Donkins be satisfied with her picture, Miss Lydia Louisa Summerhouse Donkins has a friend who is *also* a carriage person, who would *also* wish to have her likeness taken."

About this letter Mrs. Cameron records :—"I answered Miss Lydia Louisa Summerhouse Donkins that Mrs. Cameron, not being a professional photographer, regretted she was not able to 'take her likeness,' but that had Mrs. Cameron been able to do so, she would have very much preferred to have her dress crumpled."

Mr. Davison continued that he hoped that the Club would make use of all the instruction it could gain from Mrs. Cameron's pictures, and that in time, following on the lines of such work as had been occasionally done by Mr. Faulkner, Mr. Lyonel Clark, and others, they would see them not only equalled, but eclipsed.

STEREOSCOPIC PHOTOGRAPHY.*

BY G. F. POWELL.

First of all I begin with a lament that this branch of photography is not as popular as it deserves to be, and surprise that it has so long remained so. Secondly, I will try to account for its unpopularity.

1st. Fashion; it was once very popular, but fashion changes, and the pendulum has swung to the opposite side.

2nd. The degeneration of the subject and style. Of course I do not refer to the very beautiful glass transparencies which many remember with keen pleasure, but to the absurd and vulgar groups, which must have gone far to discredit the stereoscope in some minds.

3rd. I think many admirers of the stereoscopic picture must have been sadly disappointed by the slides sold, for doubtless many have been taken in by the fraud of making a so-called stereo slide without the double negative. Such, it is almost needless to say, are flat as a single picture, and to this we shall again refer.

These three causes have, let us hope, worked their own cure. The pendulum of fashion is on its return, the vulgar style is ignominiously dismissed, and, as a rule, photography is too much to the fore for unscrupulous dealers to pass off bad work on the public.

This brings us to what a stereo slide is, or rather should be, namely, two pictures taken separately from the opposite angles at the base of a triangle, the sides of which should converge to a point as nearly as possible the most distant in the view to which the camera is directed; the length of the base of the triangle varies considerably with the subject. A good rule is, for ordinary work, to have the lenses (if a pair are used in a rigid front) two and three-quarter inches apart, centre to centre, this being about the distance apart, centre to centre, of the eyes. A better plan is to have a special front with double rack-and-pinion, by which the lenses can be brought nearer or set farther apart as required. Of course when the two pictures are taken upon the same plate (any landscape slope will do, say 7½ by 5), the camera must have a central partition to prevent blurring, or over-lapping of the two pictures in the centre. A single lens may be used if a sufficiently long sliding front is adapted, which will allow the lens to be moved laterally from centre to centre of the halved plate; but this will only do for still life, or possibly for portraiture. But if this branch of photography is to be carried out satisfactorily, twin lenses are absolutely necessary, inasmuch as it is impossible to take moving objects for the stereoscope with one lens, and sea pieces lose all their value if a wave, for instance, is not taken by both lenses at the same instant.

The base of our triangle, or distance between the lenses, will vary slightly in ordinary land or sea scapes, according to the distance from the camera of some of the near as well as distant objects. And here I would remark that near objects are necessary to the success of the pictures, the principle of the stereoscope being what I call relative displacement of objects one to another when viewed by either eye or either lens separately. Hold up your finger or other small object before any other object, look with one eye and then with the other, and in turn different parts of the background will be covered by what is held up, so that with both eyes you, as it were, look round the near object or objects. This, though crudely explained, will possibly illustrate the principle of the stereoscope, and show that two separately taken pictures are necessary. When well placed or selected foreground objects are secured in a picture, the result in the stereoscope is that other objects and parts of the composition will fall back or assume their relative positions, and the effect desired is obtained. For some subjects (principally scientific) the base of the triangle or distance apart of the points for taking the two pictures is considerable, some thirty or forty yards for the Pyramids, to many hundreds of miles for the moon; and this reminds me that stereo work can be accomplished by a quarter or 5 by 4 camera, and taking two pictures by placing the camera at the different points as required, for ordinary work at the opposite ends of a graduated board fastened to the top of the tripod.

Any process for negative taking or printing will do for the work, but I consider that the transparency for the stereoscope is the perfection of photography; the roundness of life is given by the stereoscope to a friend's likeness, to a bit of lovely scenery, snow, hoar frost, or ice, which might pass unnoticed in the flat photograph, but which is absolutely charming in this instrument. Too much contrast is undesirable, and what looks flat and wanting in pluck and crispness outside the instrument may be exactly right inside. The stereo-photographer can often choose charming bits, which, as single pictures, would be passed over. To return to the negative; presuming it is double, on the single plate being taken, as usual, upside down, on placing it picture wise, the right and left pictures are reversed, and must be cut asunder for mounting, or the effect is the reverse of what is desired, or pseudoscopic. There is a way of folding a double-length strip of paper, and printing two copies, by which means the paper can be cut in the middle, and save the double mounting; but this requires calculation and care hardly worth an amateur's while, though valuable where many prints are required off the same negative. Glass transparencies, too, require great nicety and care, but which amply repay him. A word as to subject; choose such as are likely to please generally, and not one's self alone, and such as will, as far as possible, explain themselves.

* Abstract of a paper read at the Bath Photographic Society.

A STANDARD METHOD OF DEVELOPMENT.*

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

No one, I imagine, would venture to propose a uniform method of development for all the varied subjects with which a photographer meets in ordinary practice. The nature of the subject, the conditions under which it was photographed, and the intention of the photographer, or, in other words, the character of the result which he desires to obtain, must all be taken into account in the subsequent treatment of the plate; and to develop all plates in the same way would reduce photography from the level of a method of fine art, which most of us hold it to be, to the level of a mechanical process, which some critics tell us it is.

There are, however, many cases, chiefly of a scientific character, in which a uniform method of development is desirable, if not indispensable. Stellar photography is probably the best example which can be cited. When testing plates, too, it is essential to operate under strictly comparable conditions. The necessity for adopting some constant method of development in the work on orthochromatic photography with which I am at present engaged, led me to give some attention to the matter, and this paper is mainly a statement of the chief points which seem to require careful consideration in this connection.

When attempting to select a standard method of development, we may direct our attention to: (1) The sensitiveness, as measured by the intensity of illumination or time of exposure required to produce an impression which can be developed; or (2) the gradation of the resulting image.

I may say at once that, in my opinion, it is not practicable to frame or adopt any standard developer which shall be generally applicable when gradation is the chief consideration. A developer which would be perfectly satisfactory for line subjects would be unsuitable for subjects in half-tone; a standard which would satisfy an operator who desires to produce soft negatives would not meet with the approval of an operator who delights in "pluck." Gradation depends not only on the mode of development, but also on the manner in which the emulsion has been prepared, and the physical character of the gelatine which has been used. Moreover, the relation between the gradations given by two different kinds of plates does not remain constant, but varies with variations in the composition of the developer. The most, therefore, that seems possible is to devise some standard method (or methods) from the point of view of sensitiveness, and then learn to deduce from the results obtained with it as much information as it can be made to give concerning the gradation-quality of the plates.

The problem consequently becomes narrowed to a method of development which will enable us to compare the sensitiveness of different plates, and to obtain from any plate the maximum amount of detail which it can be made to yield without fogging. Our object is to obtain a visible and printable deposit of metallic silver from every part of the emulsion which has been acted upon by light, without reducing those portions on which light has not acted. Development is a process of *selective* reduction, and this fact it is very important to keep in mind. We have likewise to bear in mind that many photographers, even scientific photographers, are not chemists, and have very little skill in chemical manipulations; they also have to rely upon the dealers in chemicals for the purity of their preparations.

A standard method of development, if it is to be really useful, and gain general adoption, must fulfil several conditions:—

1. It must be simple in execution.

2. It must resemble, as closely as possible, the methods used in ordinary practice.

3. It must involve the use of only such chemicals as can be purchased in a state of purity, and are not hygroscopic, or liable to undergo other alteration when stored with ordinary care.

4. The solutions required must be easily prepared, and not liable to alteration.

Ferrous oxalate dissolved in a solution of potassium oxalate fails to fulfil several of these conditions. Potassium oxalate and ferrous oxalate can, it is true, readily be obtained in a state of purity, but the preparation of a solution from these materials is a somewhat tedious operation. Ferrous sulphate is a more convenient iron salt in practice, but both the solid and its solution readily oxidise. This difficulty is removed to a considerable extent by the use of ferrous ammonium sulphate, but even this salt alters somewhat rapidly after being dissolved. The ferrous oxalate solution itself oxidises very rapidly, and the ferric oxalate which is formed is not only a vigorous retarder of development, but is also a reducing agent of considerable power. Lastly, we have to take into account the fact that this developer is rarely used for ordinary negative work, and even its use for positives is becoming less frequent.

Eikonogen is also unsuitable, because: (1) Its purity at present is a very variable quantity; and (2) Its behaviour with various accelerators, and under different conditions, is not yet fully understood.

There remain pyrogallol and quinol, and of these the former seems decidedly preferable, because, in the first place, it is the developer most largely used in actual practice; and, in the second place, its much greater solubility makes the preparation of solutions an easier and more rapid operation than when quinol is used.

Pyrogallol is readily obtained pure, and remains unchanged for a very long time in well closed bottles if kept out of contact with ammonia vapour.

The alkali employed as an accelerator may be ammonia, ammonium carbonate, sodium carbonate, or potassium carbonate.

The restrainer may be an alkaline bromide, or an alkaline salt of an organic acid.

Ammonium bromide is the most suitable restrainer when ammonia is the accelerator. It is readily obtained pure, and, although slightly hygroscopic, it is easily dried in an air bath, or by placing it on a clean plate on the top of a moderately warm oven. Potassium bromide, on the other hand, usually contains small quantities of bromate, and, not unfrequently, small quantities of caustic potash. If, however, sodium or potassium carbonate is used as the accelerator, and a restrainer is required, potassium bromide must be used, since ammonium bromide would be decomposed with formation of ammonium carbonate and free ammonia. Alkaline salts of organic acids are unsuitable for the purpose under discussion, because of the difficulty of obtaining them in a state of purity.

* Read at the Photographic Society.

The French Exhibition in London will be opened early this month by the Lord Mayor. Its president is M. Gustave Sandoz, and its Director-General Mr. J. R. Whitley.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Heliochromic Experiments—New Collodion Emulsion Paper.

Since the results of Mr. Fr. Veress's attempts to produce photographs in natural colours have been published, the interest of the profession as well as of the public has been again directed to this mysterious branch of our art-science which, in 1839, Sir John Herschel pointed out as "only a question of time." Half a century has elapsed since then, and the problem is still unsolved. It is well known that by the investigations of Becquerel and other pioneers of our art-science, the possibility of reproducing colour by means of photography has been proved, but that they only partially succeeded in fixing their prints. Of late, Mr. Veress has, as the tests of Professor Vogel are showing, not yet obtained results which can be regarded as permanent, but Mr. Veress, whom I know very well, and who is as assiduous and as talented as he is modest, has never claimed to have solved the problem of heliochromy. On the contrary, he describes his labours as simple experiments, about which people make "too great a bustle," as he expresses himself in a letter. The partial success of these labours has incited other investigators to repeat the experiments of Niépce de Saint Victor and of Poitevin.

At the last meeting of the Society of Practical Photographers of Berlin, Mr. Gaedicke presented prints, produced by himself by means of the older methods, which exhibited a number of beautiful, brilliant colours. He said that they were produced on gelatino-chloride paper, which was previously exposed to light until it turned dark reddish brown, in order to obtain the sub-chloride forming the basis of these experiments. The paper was next, according to Poitevin, bathed for about two minutes by lamplight in a mixture of equal parts of a concentrated solution of sulphate of copper and of a five per cent. solution of bichromate of potash, then dried in the dark, and exposed to sunlight beneath coloured sheets of glass. In order to shut out the invisible ultra-violet rays, which in printing act injuriously, Mr. Gaedicke used a glass plate coated with a gelatine solution to which a trace of uranine or aesculine had been added. After drying, this glass is almost colourless by transmitted light; if, however, it is held in an inclined position and looked at from above, it appears, in the one case, beautifully green, in the other blue.

Dr. A. Miethe recommended, in order to conserve more fully the fluorescent qualities of the plates after drying, the addition to the gelatine solution of a small quantity of glycerine. He gave the following formula:—

Gelatine	2 grammes
Glycerine	2 ,,
Water	25 c.c.
Aesculine	0·05 gramme

The gelatine is dissolved at a low temperature in 15 c.c. of the water, then the glycerine and the aesculine, the latter dissolved in 10 c.c. of water, are added, and the whole is filtered through sheep's wool. With this solution the glass plates are coated rather thickly, allowed to set, and dried in a place free from dust. Through plates of this kind the ultra-violet rays still partially pass; in order to shut them out completely, it is necessary to combine with this aesculine plate another one, which contains 0·02 gramme of fluoresceine instead of the above given quantity of aesculine. The two plates with the film sides placed together, and the edges cemented with black paper, which may be coated with asphalt varnish, in order to protect the films against the influence of the air. If after some time the aesculine plate turns brown, it must be replaced by a fresh one. The pure aesculine as well as the fluoresceine may be procured from Dr. Schuchardt, of Görlitz. A combined plate of this kind may be placed over the printing frame, which contains the above described dark brownish silver sub-chloride paper together with the coloured sheets of glass, and the whole is then exposed to diffused daylight. Beneath a yellow sheet of glass the paper soon turns lighter, and after about half-an-hour it will be printed out, showing, if watched by lamp-light, a rather brilliant yellow tone. Beneath a ruby glass the paper acquires a brilliant vermilion colour; beneath a green glass a slightly brilliant olive-green; beneath a blue cobalt glass a darkish brown. The coloured prints keep for some time, provided that they are not exposed to direct sunlight, and if after printing they are washed several times in water which has been slightly acidulated with sulphuric acid. Dr. Miethe remarked that in his own experiments he used an ordinary collodio-chloride solution with silver in excess. He exposed it in a light coloured bottle to sunlight for several hours, shaking it from time to time; and then decanted it from the brownish sediment which was formed. Paper prepared with this collodion gives with rapidity bright colours beneath coloured gelatine films. Dr. Miethe tried to fix his prints with a solution of magnesium chloride, which has recently been recommended for this purpose by Mr. R. Liesegang, and to which he added alum up to three per cent. This fixing agent seems, however, not to fulfil the hopes which it afforded; in the case of Dr. Miethe's experiments, at all events, the vivid colours of the prints faded even in the dark, and after some days nothing but faint tints were visible, which, however, did not become weaker even after they had been exposed to sunlight for some hours.

It will be seen from these experiments that we at present have not advanced beyond the position of forty or fifty years ago. The possibility of reproducing natural colours by photography to a certain degree has been proved, but we are waiting for somebody who can invent the means of fixing the colours obtained.

A new collodion emulsion paper has been introduced by Mr. V. Angerer, of Vienna, which, as far as can be judged from a few experiments I have made with it, answers well. Collodion emulsion paper, in general, does not enjoy so much favour in this country as its mighty rival, the gelatino-chloride paper, probably because the treatment of the latter is more convenient. The collodion emulsion paper, during the different manipulations after it has become wet, is rather tender, and has a decided inclination to curl, particularly when the paper is somewhat thick. It should be carefully treated while in a wet condition, the collodion film being easily damaged, particularly around the edges. These insignificant defects of the chloride of silver collodion paper are, however, sufficiently compensated by the extreme sharpness of the pictures on the same, particularly in comparison with albumen paper, where the details in the deepest shadows are hardly visible. For toning, I use the sulphocyanide of ammonium bath, which is convenient in its handling. The prints tone extremely quickly, even in comparison with those upon gelatine paper, if toned in the combined toning and fixing bath. Enough care cannot be taken not to lose the beautiful purple tone of the collodion paper by the rapidly-following bluish-black.

Notes.

Photographers are not alone in the difficulty of deciding upon one uniform system of weights and measures. The subject is continually being alluded to, and it cropped up incidentally at the last meeting of the Photographic Society, when the much-abused English system found a champion in some respects in Mr. C. H. Bothamley. The American pharmacists are about to take the matter in hand, and it will shortly be discussed by the Revision Committee of the U. S. Pharmacopœia. Mr. J. W. England, writing on the subject in the *American Journal of Pharmacy*, advises the abolition of the "parts by weight" system, and the adoption of the French metric method. The metric system is supposed to be in use in America, but it is only so in name, for Mr. England says, that of nearly 500,000 prescriptions over which he has had supervision in preparation during the last five years, there have been but two metric prescriptions, and from enquiries he has reason to believe that the general experience differs but little from his. He points out that if the physicians do not lead the way, it cannot be expected that pharmacists, or chemists and druggists as we should call them, will trouble about the metric system. Photographers are much in the same position here; they are waiting for the dealers to initiate a simpler method. The French are in the happy position of having settled the question. Were they not, it certainly would have been one of the first things discussed at the International Photographic Congress of last year.

A fine set of illustrations from photographs are promised with Mr. Stanley's forthcoming article in *Scribner*. These photographs are of scenery upon which the eye of a white man never gazed previous to Mr. Stanley's visit. It would be interesting to know Mr. Stanley's photographic experience—whether he developed his plates on the spot, or whether he brought them away under lock and key to be developed at home. A word or two also as to how the natives regarded the camera would not be amiss.

The latest of American photographic notions—the costume album—has been ridiculed, but how valuable for the student of social philosophy, if the term may be used, would such a record of a quarter of a century's fashions be. The costume album, it may be as well to explain, is thus constituted. On the left hand page is the photograph; on the right is an artistic arrangement of the materials composing the costume which the photograph represents. The collector usually begins her album with her wedding dress, and proceeds with the various "confections" of the dressmaking art in which she indulges from time to time. Such an album would, we fancy, be productive of rather mixed feelings on the part of the persons concerned. To the lady it would afford, on the whole, a pleasant reminiscence, dashed slightly with a little bitterness, because dressmakers do occasionally make misfits; but to her husband, it can only revive recollections of the many cheques which the dresses represent. The student of whom we have already made mention would probably be the person who would gaze upon a "costume album" with unalloyed delight.

The fate of the *New York Illustrated Daily* is not encouraging to enterprises of a similar nature. It has died out, never, so we are told, to be revived. For a few weeks after it stopped there was a project to carry it on, but this was abandoned, and everything has been sold. Nearly a million of dollars was sunk in the paper, but it did not succeed because of the inferior quality of its illustrations. Photography has done much since the *New York Daily* was started to make such an undertaking possible, but the problem of combining very rapid printing with artistic results has not yet been solved, and this problem is at the present moment the stumbling block in the way of success. Given the necessary time, "process" work in the hands of those who know how to draw for its requirements has a chance of its own. The latest illustrated weekly paper started in New York is of a large size, and entirely illustrated by process cuts of a high class.

A photographic record is being kept of the progress of building the new library, Washington. A camera is planted on the roof of the building occupied by the architect, and a record of every detail of the condition of the work, the height of the walls, the piles of material, is thus preserved. The photographs are afterwards classified, are properly labelled, and can be produced for reference if any question arises as to what was done, or what was not done, at any stage of the work. Thus the camera acts as a check upon the contractor; but this is not the sole purpose for which the photographs are taken, as they are found to be a valuable supplement to the written records of the operations.

It is a pity this plan was not adopted when the foundations of the Board Schools about which so much has been said, were put in. Though the camera is not yet able to distinguish between good and faulty bricks, or real mortar and the "mic-mac" imitation, it would probably record not only the depths of the foundations, but the kind of soil upon which the bricks were laid. Contractors have a wholesome dread of the photographer. We knew a case where, on the roof of a new building falling, a photographer was called in to photograph the place, so as to produce evidence of faulty construction in case the contractor repudiated any liability. When the photographer appeared on the ground, the contractor's men, acting under orders, surrounded him, and effectually prevented anything being done, by upsetting his dark tent.

HOW ANSCHUTZ PHOTOGRAPHS THE LARGER WILD BEASTS.

About a quarter of a century ago an interesting article on the photography of brutes, written by Frank Haes, and read before the then North London Photographic Association, appeared in the Photographic News. The experiments of Mr. Haes seem to have been attended with no little difficulty and danger. In the first place, he complains that the prevailing colours, red and yellow, are not favourable for photography. Next, he was more or less unsuccessful, generally more, with the zebra and the ratel, the hyrax (the Biblical coney), and the kiwi-kiwi, the leucoryx and the Syrian wild ass, the dingo, and the Tasmanian devil. The chimpanzee was too ill-tempered to allow his portrait to be taken, and the innate modesty of the monkey possibly lay in the way of a successful picture. One variety of the simiæ, when everything was ready, would turn suddenly round and present a view which the artist by no means desired. Another variety would insist on looking steadily into the camera. The goats had to be held by the beard, the weak point of the goat, and the iguanas by the tail. The African python chose to tie himself in a very complicated knot, and the confusion of the armadillo was such that it was difficult to determine which was his worthier end. The clouded tiger could not well be taken inside his cage because of the bars, and the space he occupied was, says the author of the article, too small to admit of my introduction. There may have been other reasons for his not entering the clouded tiger's den, but he has omitted to declare them. The modesty of the monkeys has already been mentioned, but they appear to have been inferior in this virtue to the aye aye. This singular nocturnal quadruped, the cheiromys Madagascariensis, which Cuvier placed among rodents, but was referred by Sonnerat to the family of makis or lemurs, gave especial anxiety to the photographer. Its diffidence, whether natural or acquired, was extreme. When the camera was in readiness, and the door of its cage was opened, it immediately covered itself completely with its tail.

Brute photography is better managed now than then. In the Zoological Garden of Breslau, and elsewhere, many excellent portraits have been taken. Of the method adopted in taking a bear in Breslau, the following description is given in a German paper.

The present month's number—number 15—of the German *Photographic News*, presents its readers with two illustrated supplements: the one an instantaneous photograph of a bear by the well-known Ottomar Anschütz of Lissa, the Polish Leszno in Russia, some forty miles south of Posen, signed on a portion of rock which the animal is mounting, "Ottomar Anschütz, Lissa (Posen), 1888." Of this a photogravure has been printed by H. Riffarth, of Berlin. The other is a portrait, an original negative of Fr. Muller, of Munich. This is extremely well represented as a photogravure by the Art Publication Institute of Dr. E. Albert & Co., of Munich, and shows, says the German paper, what the treatment of Dr. Albert is able to effect in the ordinary taking of portraits. The treatment is even better adapted for this kind of photography, as we shall demonstrate, says the German *Photographic News*, in our next number, which will contain a group by Brokesch, of Leipsic.

With regard to the portrait of a bear, the reader is informed that the original sitter, or rather climber, is to be found at his present residence in the Zoological Garden of Breslau, which has been often visited by Herr Anschütz, as is well known, for the purpose of taking portraits of its inhabitants. We will, says the above quoted journal, give our readers some little insight into the plan adopted by Herr Anschütz of taking wild animals, which he has himself kindly communicated to us.

The usual method of taking savage beasts in their cages has a good result only exceptionally, for the three following reasons. The first reason is that the lighting arrangements are not generally of the most convenient character; the second, that the narrow space in which the animal is confined hinders its free and natural motion; the third, that the iron bars of the cage are altogether out of place in the picture. Herr Anschütz therefore constructed for himself in Lissa a large enclosure or keep, in which he was able to take the smaller animals in various ways to his complete satisfaction. Foxes, wolves, and apes were also well photographed in this improvised animal studio.

But for the larger ravenous inmates of the Breslau Zoological Garden this enclosure was clearly not suitable, and these inmates could scarcely be transferred from Breslau to Lissa. Herr Anschütz then conceived the idea of building a larger and stronger kind of keep in the Zoological Garden. Through the courtesy of the directors of the Garden in Breslau, Herr Anschütz was able at the beginning of the year 1888 to erect a firmly constructed keep of strong planks of a superficial area of some 140 square metres. This enclosure was open above, but the walls had a height of six metres, which fulfilled all necessary requisites.

In an additional wing on one side of the enclosure there are placed three cages serving for the sleeping apartments of the wild animals; on the longer side several underground passages lead into the enclosure itself. These are fastened with folding iron gates, and serve to facilitate the business of portraiture.

On the other side is an oblong aperture, furnished with an iron shutter. Here the apparatus is placed commanding a view of the enclosure. As soon as the animal comes into the space commanded by the camera, the portrait may be secured. The background of the enclosure is a painted landscape, which is varied according to the habit of life, colour, and size of the animal to be taken. Such variations harmonise naturally with the foreground, consisting of rock or stone.

When their photographs are to be taken, the beasts are caught and brought in a transport cage into the enclosure. After some time, and after they have become accustomed to their new apartment, they are photographed. The original pictures, as all of Herr Anschütz's studies, are of smallest size, and are afterwards enlarged.

A great difficulty often occurs in bringing the animals into the proper spot for their portraiture—that is, into the full sunshine. In this case hunger and thirst seem the only available roads to success. Living food is commonly distributed to the beasts on such occasions, whereby a more exact representation of nature, and an increased effect is secured. The photographing of bears, says Herr Anschütz, is an especially difficult undertaking, since these animals manifest great unwillingness to enter the photographic studio. Eight days were required to bring these refractory subjects before the photographic lens. Even fasting was unable to move their stubborn minds, and it needed an extreme degree of artifice to induce them to enter their respective cages. But *en revanche*, these bears

behaved themselves, after they had once got into the studio, in a manner which was morally beautiful. Their general deportment was far more decent than that of other beasts. And so Herr Anschütz was enabled to take over three hundred distinct likenesses of these regenerated brutes. Although, he says, I had on many occasions and with much zeal studied the characters of Mr. and Mrs. Bruin—or, as the Germans say, Herr Petz and Gemahlin—I was nevertheless much astonished with the variety of their gestures and the general many-sidedness of their demeanour. The different sentiments of the mind are in no other animal so clearly expressed as in the bear. On several occasions I have been much surprised by their power of observation, and I have come to the conclusion that the bear is the wisest of the beasts.

The German *Photographic News* promises a description at a later date of the instantaneous apparatus employed by Herr Anschutz, an apparatus which was shown lately at the exhibition at Weimar. The manufacturer has, it seems, some additions to make, which will considerably change the character of the instrument.

PHOTOGRAPHY IN NATURAL COLOURS AS EFFECTED BY HERR FRANZ VERESS, OF KLAUSENBURG.

BY DR. J. M. EDER.*

THROUGH the kind mediation of Herr E. Von Gothard, of Hereny in Hungary, I have received some photographs in natural colours by Herr Franz Veress, of Klausenburg; some of these photographs are on glass, and are to be viewed as transpareneies, whilst others are on paper, and show by reflected light.

The glass pictures show a beautiful ruby red colour; this indeed predominates for the most part in the diapositives as the ground colour. On this is seen a vividly coloured brilliant picture, in which especially, deep ruby and bright yellow are conspicuous, and contrasting with them are distinct blue-violet, and blue: green, on the other hand, is not represented in these pictures. The outlines of the photographic picture are perfectly sharp, and the different portions of the glass picture show with complete distinctness from each other.

The paper pictures have a greyish brown ground colour, on which the photograph in natural colours stands out; in this case also the colours from ruby red to orange yellow predominate, but in one of them there is also a decided violet blue. The photographs in question are to a certain extent fixed, since after a stay of some hours in a light apartment they did not show the smallest change. In addition to this, they had been examined by many persons in daylight without any special care being exercised, and were not injured thereby. I did not apply any more stringent test to ascertain their permanence under the influence of light, as I wished not to risk injury before showing them at the March meeting of the Vienna Photographic Society.

On the preparation of the sensitive surface, Herr E. von Gothard communicated briefly to me a few data. The sensitive compound is a silver chloride collodion, or gelatine emulsion of special preparation, spread upon glass or paper. The plates are exposed in a printing frame—the glass ones for two or three hours, and the paper ones for three days—under a transparent coloured drawing. The colour of the emulsion film is brownish red: the picture appears in a few minutes in a negative form, the dark places showing as white. The colours come out slowly, and then they are fixed in an alkaline bath, which makes the colours still more intense. In the camera, weeks of exposure are required.

Herr Veress has, however, found a sensitizer by means of which the exposure may be notably shortened.

It appears to me that this process of photo-chromy is a happy application of the photo-chloride of silver described two years since by Carey Lea, the same substance probably as that described fifty years ago by John Herschel (1840), Ed. Becquerel (1847, 1848, and 1855), Niepce de St. Victor (1851-1866), and which Zenker has dealt with in his "Photo-Chromie."

As far as I am aware, the application of colour-sensitive chloride of silver in the form of an emulsion has hitherto been but little if at all practised, and the skilful experimentalist Herr Veress owes the noteworthy success of his photographs in natural colours to this combination.

In view of the circumstance that Herr Veress, after a year and a half of experiment, can already show such results, it is to be hoped that the continuation of his researches will hasten the solution of the problem of photographing in natural colours in an important degree.

It is at present to be noted, that in spite of the imperfection of these first specimens, Herr Veress's experiments have met with success, especially in the ability to fix photographs showing the natural colours. Against this gain, the circumstance that all colours do not show with the same vividness is a consideration of less importance.

* Translated for the PHOTOGRAPHIC NEWS from the *Photographische Correspondenz*.

A NEW PHOTOGRAPHIC SOCIETY.—It is proposed to form a photographic society in Ealing, and it is probable that suitable accommodation for meetings may be obtained at the Local Board Offices, and a convenient dark room be fitted up for the use of members. Those wishing to join should communicate with Mr. H. W. Peal, 2, Craven Terrace, Ealing.

ROYAL INSTITUTION.—At the general monthly meeting held last Monday, with Sir James Crichton Browne in the chair, the following vice-presidents for the ensuing year were announced:—Sir Frederick Abel, C.B., D.C.L., F.R.S., Mr. William Crookes, F.R.S., Dr. Edward Frankland, F.R.S., Mr. William Huggins, D.C.L., Earl Percy, Mr. Basil Woodd Smith, Sir James Crichton Browne, M.D., treasurer, and Sir Frederick Bramwell, Bart., F.R.S., hon. secretary. Professor Tyndall was elected honorary professor of natural philosophy, and Lord Rayleigh was elected professor of natural philosophy. At the annual meeting held on Thursday, May 1st, the annual report of the committee of visitors for the year 1889 testified to the continued prosperity and efficient management of the Institution. The real and funded property now amounts to above £82,000, entirely derived from the contributions and donations of the members. Fifty-one new members were elected in 1889. Sixty-three lectures and nineteen evening discourses were delivered in 1889. The books and pamphlets presented in 1889 amounted to about 283 volumes, making, with 539 volumes (including periodicals bound) purchased by the managers, a total of 822 volumes added to the library in the year. The Duke of Northumberland was elected president, Sir James Crichton Browne treasurer, and Sir Frederick Bramwell, Bart., secretary. Mr. Louis Fagan, assistant keeper of the department of prints and drawings at the British Museum began a course of three lectures on "The Art of Engraving" on Tuesday, May 6th. Professor Dewar, F.R.S., commenced a course of six lectures on "Flame and Explosives" on Thursday, May 8th; and Dr. Charles Waldstein, director of the American School of Classical Studies, Athens, will begin a course of three lectures on "Recent Excavations in Greece" to-morrow.

THE PHOTOGRAPHY OF THE MORE REFRANGIBLE RAYS.*

BY V. SCHUMANN.

IN all the domains of science the method of taking photographic observations has of late years grown apace, and supplants more and more the ocular method. Of all the students of science, however, who bring photography into their service, there are none who can derive so much advantage from the photographic registration of observation as those who deal with the spectrum. The rays thought to be alone photographically active—those from the region of the blue and violet—have now, for some decades past, been fixed by the "never forgetting retina of the camera" for the observation of future generations. The red and yellow, on the other hand, first came into importance photographically since H. W. Vogel has shown that by treating photographic plates with suitable dyes—optical sensitisers—they may be rendered sensitive for the optically bright rays. Spectroscope workers, like Hasselberg, Rowland, and others, have made good use of the important discovery, and especially since the voluminous researches of Dr. J. M. Eder on optical sensitisers have been given to photographers, they having succeeded in photographing that part of the spectrum which was thought to be beyond their grasp.

Yet further. By the help of optical sensitisers (cyanin), Burbank has so far succeeded in securing the infra-red spectrum on gelatine plates, that his results show twice as many lines as those in the spectrograph taken some years earlier by Capt. Abney, which had so much enlarged the borders of the knowledge of the spectrum attainable by our science. We may well believe that photography, since in recent years it has made so much advance in this direction, may yet be made to work as far into the infra red as Langley, by means of his bolometer, has opened it out to us.

Invisible as is the infra-red in general, so on the other side of the spectrum is the ultra-violet. Invisible, however, only for our human eyes, by no means so for the photographic plate. On the contrary, there is a not inconsiderable array of sources of light that have their most powerful photographic action, not in the visible spectrum, but in that portion where, to our retina, total darkness reigns. To this class belongs particularly the light of the electric spark. Sunlight comes very near to it in this respect. It must, however, be well understood that the rays of the latter are very strongly influenced by the properties of the atmosphere through which they have to pass before they reach us. Of even greater influence than the atmosphere may be the nature of the media of which the optical part of the photographic apparatus is composed. This applies not only to photographic apparatus for spectrum work, but to photographic objectives in general.

All glass, optical glass not excepted, however colourless and however transparent to our eyes, absorbs, nevertheless, a considerable amount of the ultra-violet light. Many kinds of optical glass are so opaque to this kind of light that they obstruct almost the whole of the ultra-violet rays. To quote only one case, when the sun's spectrum is photographed with H. W. Vogel's small spectrograph, it is found that the spectrum picture ends at the same place as it ceases to be visible to our eyes. Such a spectrum picture, especially if taken to judge of the qualities of a colour-sensitive plate, has, on account of the partial suppression of the blue, violet, and ultra-violet rays which result from the use of the heavy flint glass of the prism and the apparatus, but a relative value. Only to the eye of one accustomed to working with the spectrum is there evidence in it which is understood. When, on the other hand, a person unpractised in spectrum photography uses apparatus of this kind for studying orthochromatic plates, he will be sure to read a degree of sensitiveness for the yellow and red rays which the plate does not at all possess. In this case *it is not the sensitizing dye which makes the plate sensitive to colour, but the heavy flint glass of the Amici prism* which reduces the blue and violet rays so far that they may only produce about half their proper action on the plate, whilst the red and yellow rays fall upon the coloured gelatine film almost unchanged. In such circumstances, it is easy to prepare plates that shall appear to possess enormous sensitiveness for the yellow rays. A photograph taken with Vogel's small spectrograph shows certain rays to be as much restrained as in a photograph taken with a lens, and through a strongly-tinted yellow screen.

When the prisms and lenses of a photographic spectrum apparatus consist of glass of the same amount of transparency for all rays as our photographic objectives, the photograph of the solar spectrum shows, with short exposure, a larger portion of the ultra violet rays in active force. From such a spectrum photograph the colour sensitiveness of orthochromatic plates, such as are prepared for our use, can be safely estimated.

The fewer rays that are withheld by the lens, the shorter may be the exposure of the plate. If the same subject is photographed with a lens made of glass and again with one of quartz, it is found that the last-named works considerably quicker than the other. Quartz allows the ultra violet rays to pass almost entirely. If a glass can be made which permits nearly the same amount of rays to pass as quartz does, the exposure required for taking a photograph will be considerably reduced from what it is at present.

(*To be continued*).

* Translated for the PHOTOGRAPHIC NEWS from the Special Supplement to the *Photographische Rundschau*.

PHOTOGRAPHIC LENSES.*

BY THOMAS R. DALLMEYER.

IN this country much valuable work has been accomplished by Dr. John Hopkinson and Professor Stokes, in obtaining convenient methods of expressing the measure of the irrationality of combinations of various glasses made by Messrs. Chance, of Birmingham. Dr. Hopkinson contributed a very important paper, especially to opticians, on this subject to the Royal Society in 1877, and in conjunction with my late father, worked out some important and valuable improvements in glasses for special photographic purposes, and succeed in practically curing several of the glasses then made from "sweating." Professor Stokes, too, suggested a titano-silicic crown that should be perfectly achromatic with a flint; this glass, however, was not found to be of much practical value. To express the irrationality, Dr. Hopkinson found a convenient formula that more accurately represented the facts from observations than the direct method of curve drawing, as the errors in this case would be greater than in those of observation. I refer those interested to the paper, but give you the results of that formula, which serve to show

* Continued from page 345.

how little there was to choose between the ordinary glasses made by Messrs. Chance. The figures show the measure of irrationality in a combination of each combined with a standard:—

Hard crown.	Soft crown.	Titanic crown.	Light flint.	Dense flint.	Extra dense flint.	Double extra flint.
—11·7	—10·7	—9·4	—9·4	—11·8	—11·9	—13·2

It will be interesting to compare some of the new glasses from Jena with these; and although they are presented in a less elegant form, the prospectus is a very practical representation of the qualities of the glasses, so I give the data of Chance's glasses in a similar form to those of Jena; but we will first make a preliminary investigation as to the conditions to be arrived at.

The dispersion, then, of colour produced by a positive or convex lens, may be neutralised by the addition of a negative or concave one, without cancelling the deviation of the rays, as the positive and negative lenses act with opposite effect. In other words, a compound lens may, by the proper adjustment of the *powers* of the separate lenses, be made achromatic or actinic, although if irrationality in the dispersion exists, only the union of a definite number of species can be combined, according to the number of different media forming the compound lens.

If the radii of a lens are r and s, in general approximation,

$$\frac{1}{f} = (\mu - 1)\left(\frac{1}{r} + \frac{1}{s}\right).$$

Herschel terms the reciprocal of the focal length the *power* of a lens, and this is seen to depend on $(\mu-1)$, which we may take as the measure of the refracting power of the substance of which the lens is composed, and the second $\left(\frac{1}{r} + \frac{1}{s}\right)$ the simplest measure of the joint curvature.

To determine the relation between the focal lengths of two lenses that shall be achromatic or actinic when in contact:—

Let $\frac{1}{\rho}$ represent $\left(\frac{1}{r} + \frac{1}{s}\right)$ and μ_1 μ_2 the indices of refraction for the two lenses for one species of rays.

Then if u be the distance from which the pencil originally diverged,

$$\frac{1}{v_2} = \frac{\mu 1 - 1}{\rho 1} + \frac{\mu 2 - 1}{\rho_2} - \frac{1}{u}$$

and similarly, if μ' represent the index of refraction for another species of rays,

$$\frac{1}{v_2} = \frac{\mu' 1 - 1}{\rho 1} + \frac{\mu'_2 - 1}{\rho_2} - \frac{1}{u}.$$

As v_2 is to be the same for both species, we get by subtraction, term by term, and representing $\mu' - \mu$ by $\Delta\mu$, we have

$$\frac{\Delta\mu 1}{f 1} + \frac{\Delta\mu_2}{f_2} = 0, \text{ or } -f_2 = f 1 \frac{\Delta\mu_2}{\Delta\mu 1}.$$

Now, in general, $f = \frac{\rho}{\mu - 1}$;

$$\therefore -f_2 = f_1 \cdot \frac{\Delta\mu_2}{\mu^2 - 1} : \frac{\Delta\mu 1}{\Delta\mu^1 - 1}.$$

Therefore the focal length of lenses are directly, or their powers inversely, as the dispersive powers of the media of which they consist.

Again, since $\frac{1}{f} = (\mu - 1)\left(\frac{1}{r} - \frac{1}{s}\right)$,

$$\Delta\mu \frac{1}{f} = \left(\frac{1}{r} + \frac{1}{s}\right),$$

$$= \frac{\Delta\mu}{\mu - 1} \cdot \frac{1}{f}.$$

That is to say, the chromatic variation of the power of a lens is obtained by multiplying it by the dispersive power of the medium,

$$\text{or } f_1 : -f_2 :: \frac{\Delta\mu_1}{\mu_1 - 1} : \frac{\Delta\mu_2}{\mu_2 - 1} \quad \ldots\ldots (1).$$

In like manner, by adding a third species of glass, we can satisfy a third condition, viz., that the third species should be united to the two former. And in general

$$\Delta\mu \cdot \frac{1}{f_1 f_2 \ldots fn} = n \frac{\Delta\mu}{\mu - 1} \cdot \frac{1}{f_1 f_2 \ldots fn}$$

The prospectus published by the laboratory at Jena is presented in a very practical form to opticians; the refractive index for the brightest line D being given, and the differences of the refractive indices for the four intervals, CF, A'D, DF, and FG'. The interval CF, containing the brightest portion, is sufficient to characterise the medium dispersion, and from the proportion of this to the value $\mu_D - 1$ there is given in a separate column the reciprocal of the relative dispersions or of $\frac{(\Delta\mu)}{(\mu-1)}$. The proportion of partial dispersions in the intervals A'D, DF, FG', are a sufficient guide to judge of the possibilities of successful combinations for achromatism. There are also given the numbers obtained by dividing these intervals of partial dispersion by the amount of medium dispersion for the interval CF, and a comparison of these quotients will show the tendency and amount of the residual secondary spectrum. The identity of corresponding quotients proves the possibility of achromatising without secondary colour.

Kinds of Glass.	Refractive Index for D.	Medium Dispersion C to F.	$\frac{\mu-1}{\Delta\mu}$.	Partial Dispersion A' to D.	Partial Dispersion D to F.	Partial Dispersion F to G'.	Specific Gravity.
CHANCE'S.							
Hard crown ...	1·5179	·00860	60·2	·00553	·00605	·00487	2·49
				·643	·703	·566	
Soft crown ...	1·5151	·00910	56·6	·00577	·00642	·00521	2·55
				·634	·705	·572	
Titanic crown ...	1·5432	·01021	53·2	*·00491	·00722	·00634	2·55
				·480	·707	·622	
Light flint ...	1·5738	·01385	41·4	·00853	·00987	·00831	3·22
				·615	·713	·600	
Dense flint ...	1·6202	·01709	36·2	*·00670	·01220	·01122	3·65
				·399	·714	·656	
Extra dense flint	1·6489	·01919	33·8	·01152	·01372	·01180	3·87
				·600	·714	615	
Double dense flint	1·7174	·02434	29·5	·01439	·01749	·01521	4·49
				·591	·718	·625	
JENA.							
Silicate crown of high refractive power	1·5238	·00872	60·2	·00560	·00614	·00494	2·53
				·642	·704	·566	
Light borate crown	1·5047	·00840	60·0	·00560	·00587	·00466	2·24†
				·667	·700	·555	
Silicate glass	1·5368	·01049	51·2	·00659	00743	·00610	2·76
				·628	·708	·582	
Borate Flint	1·5736	·01129	50·8	·00728	·00795	·00644	2·82†
				·645	·704	·571	
Medium phosphate crown	1·5590	·00835	66·9	·00546	·00587	·00466	3·07
				·654	·702	·557	
Borate flint	1·5503	·00996	55·2	·00654	·00669	·00561	2·56
				·656	·702	·563	
Dense barium phosphate crown ...	1·5760	·00884	65·2	·00570	·00622	·00500	3·35†
				·644	·703	·565	
Calcium silicate crown	1·5179	·00860	60·2	·00553	·00605	·00487	2·49
				·643	·703	·566	
Boro-silicate flint ...	1·5303	·01114	49·4	·00710	·00786	·00644	2·81
				·637	·706	·578	

* These intervals are taken from B to D, D to F, and F to G.

† These glasses are very soft or unstable when exposed to the air, and should be protected in use.

In the older products of glass factories it was quite sufficient to take the specific gravity of the various glasses, as a near approximation to any alteration in the optical properties of different meltings: a greater density indicating an increase of refractive index and dispersive power.

The figures in the list taken from the prospectus from Jena show that glasses are made of nearly equal relative dispersion, with considerable differences in partial dispersion; and, again, others in which the partial dispersion

is almost identical, with considerable variation in the relative dispersion. In those instances it is evident that the secondary spectrum can be abolished. There is, however, a residual tertiary spectrum in the couples referred to, but it is quite unimportant compared to the secondary spectrum left in a combination of ordinary silicate "crown" and "flint" glasses. In photographic lenses the object is to get all the chemically and visually active rays possible together, and with certain of the glasses of lower dispersion improvements may yet be made by a better correction, both in the chromatic and spherical aberrations of the eccentrical pencils in lens systems.

The first approximations in theory, both for aplanatism and actinism, are simple enough when the lenses of the systems are considered *thin*, and second approximations, for the central pencils, are given in most of the text-books in which *thickness* is taken into account, and are easily intelligible. In lenses required to be both aplanatic and actinic, we are not limited only to the central pencils, and it is of the highest importance that all incidences for the lens should give the same results as the central pencils, and it is the inquiry into the forms best suited to accomplish this that constitutes the optician's great difficulty.

As a matter of fact, it is impossible to construct an aplanatic lens that is free from chromatic aberration for a central pencil that shall be so when a pencil of rays meet the lens obliquely. Lenses may be considered as made up of an infinite number of prisms, and, as you are aware, achromatism is only possible with combined prisms for one particular incidence. Now, a parallel ray and an oblique ray must of necessity have different incidences on the surface of a system, and hence, if it is actinic for the parallel ray, it cannot be for the oblique ray, strictly speaking.

Forms of lenses than that most nearly approximate to the conditions throughout of equal incidences and refractions at emergence, will conform to the best conditions for actinism as well as aplanatism, as we shall see presently.

We have found, then, from first principles alone, that the main condition for actinism is only one of focal length to be ascribed to the various lenses of the system, and, for the best results, the powers of these components must be rigidly maintained, whatever may be the ultimate form or selection of curvatures adopted to best suit particular applications.

(To be continued.)

Camera Club Notices.—Thursday, May 15th, 8 p.m.—Informal meeting. Saturday, May 17th.—Excursion to Wrotham, for Igtham and district. Leader, Mr. D. Howards. Train from Victoria at 8.50; Holborn Viaduct, 8.45; St. Paul's, 8.48; Bromley, 9.20; arriving at Wrotham at 10.6, where a conveyance will be in readiness to convey the party to Igthaun. A later train leaves Victoria at 11.35, Holborn Viaduct at 11.30, and St. Paul's at 11.33. Very beautiful country, and picturesque and interesting subjects. Dinner at the "George and Dragon," Igtham, at 5.15 p.m. It is probable that some members may go down on the Friday evening. Those intending to join in this arrangement should notify the same on the list posted in the Club. Monday, May 19th, 8.30 p.m.—Lantern in operation. Evening for testing slides. Notice to be given to Mr. F. J. Roberts. Thursday, May 22nd, 8 p.m.—Mr. E. R. Shipton, "Cyclo-Photography."—Some recent developments, including an ideal cycle. Thursday, May 29th, 8 p.m.—Informal meeting. Saturday, May 31st.—Excursion to Pulborough and Fittleworth. Leader, Mr. Gale. Particulars will be posted in the Club.

Patent Intelligence.

Specifications Published.

5,118. *March 29th*, 1889.—"Transparent Printed Paper." William Lloyd Wise, 46, Lincoln's Inn Fields, London, Consulting Engineer and Patent Agent. Communicated from abroad by Joseph Mathieu Badon, of 59, Rue de Suède, à Saint-Gilles Lez, Brussels.

This invention relates to the production of transparent tinted paper having the appearance of stained glass, and to means or apparatus for its manufacture. Transparent tinted paper, according to this invention, is printed in a continuous form, after the manner of wall-paper, and by similar methods of printing. Like the latter paper, it may conveniently be made in rolls of eight metres length and fifty centimetres breadth.

The impressions which, as in lithographic printing, form a glaze—that is to say, do not run—may be made by various means, including blocks or cylinders, of which the printing or relief portions are formed of caoutchouc, or gutta-percha, covered with a thin coating of gelatine, applied either by immersion in a weak solution of gelatine mixed with a variable proportion of treacle, or of glycerine, or else by a brush. These printing portions can be supported and surrounded by sheets of copper, or fixed by one of the means indicated above. The coating of gelatine is intended to prevent the caoutchouc or the gutta-percha from being affected by direct contact with colours or inks made with oil or turpentine; further, the impressions obtained by this means are sharper and more regular than those obtained by caoutchouc or gutta-percha when employed alone.

Colours and inks made with turpentine or oil are employed for blocks and cylinders which are faced with caoutchouc or gutta-percha, and for blocks and cylinders of wood, or metal, covered with a coating of gelatine. Colours and inks made with water, to which gum, gelatine, glycerine, or like substance, is added, are employed for blocks and cylinders faced with caoutchouc or gutta-percha. Colours and inks made with oil, or made with water, serve equally well for blocks or cylinders which are faced with zinc.

For transparent paper printing, it is advantageous to employ the paper known as pelure. This paper, after having received the impressions to form the design, and the prints to imitate the lead and joints (of the stained glass), receives one coat of oil varnish on each face. When this preparation is dry, it is re-coated, also on both faces, with an adhesive medium composed of gelatine, which serves to fix it in place on the glass.

In applying the paper thus prepared, it is only necessary to moisten it with hot water; apply it to the glass which is to be decorated, and, to remove any bubbles of air, by passing over the paper a brush, a cloth, or any suitable body, in order to ensure complete adhesion without the necessity for using any other medium than that which is already on the product itself.

7,897. *May 11th*, 1889.—"Illusions Produced by Persistence of Vision." Eric Stuart Bruce, Gentleman, 10, Observatory Avenue, Kensington, London, W.

A narrow lathe of wood or other suitable material about an inch wide is made to revolve rapidly by hand power, an electric motor, or other suitable power, the effect being an almost invisible haze. But when the revolving lathe is placed in the path of the rays of light proceeding from an optical projection lantern in which there is placed a transparent picture, the image is apparently cast upon the air. In reality, portions only of the image are cast upon the revolving lathe in such rapid succession that they are united into the perfect whole by the retentive action of the retina of the eye.

In some cases of exhibition it may be desirable to obliterate the second image which, in ordinary circumstances, is cast upon the wall or other receiving surface behind the revolving lathe. This can be conveniently done by placing two sheets of ribbed glass, of which the exterior surfaces are covered with crumpled sheets of gelatine, preferably of a blue colour, behind the centre of the lathe at a suitable angle. The sheets of glass are sup-

ported on a stand which is capable of adjustiug the angle. The second image then falls upou the sheets of glass, and is so distorted by the angular position of the glass, and broken up by the crumpled surface of gelatine, that it is practically annihilated.

Proceedings of Societies.

The Camera Club.

May 1st.—Bedford Street, Strand, London. Mr. T. R. Dallmeyer in the chair.

Captain W. de W. Abney, F.R.S., president of the Club, then read a paper on "Pinhole Photography," a subject which he stated to be interesting at the present time, especially as one of the members of the Club is now taking pictures by the use of pinholes instead of lenses. He then set forth in detail how he had mathematically calculated the best size of pinhole to give the best picture when placed at a given distance from the plate, with the result that if that distance be ten inches, the diameter of the pinhole should be ·026 inch, or, roughly, a little over a fiftieth of an inch. Mr. Davison had pointed out to him a pinhole photograph in which near objects seemed to him more sharply rendered than those at a distance. When the objects are near to the lens, the best diameter of the pinhole differs a little from that just stated. Suppose the plate to be ten inches from the hole, and the object one hundred inches, then the best diameter of the hole is ·0246 inch. When the plate is fourteen inches from the hole, the best diameter of the latter is ·03 inch. In times past he had found the utility of pinholes for photographic purposes. Once at Zermatt he made a three hours' journey over a glacier with some ladies for the purpose of taking photographs, and, at the end of the journey, discovered that the lenses had been left behind. They lunched heavily, and some tins which had contained *pate de foie gras* were lyiug about. One of the ladies lent him a hair-pin, with which he pierced a hole in a flat disc cut out of the top of one of the tins; that hole, when measured long afterwards, turned out to be ·04 inch. They then took three or four photographs, and he had brought one of them to show to the Club. A large pinhole gives most gradation, a small one gives a "lumpy" image, so that the photographs decrease in quality when the piuhole is too large or too small. He did not like the pinhole photographs; but if anyone wanted fuzzy pictures, why not at once use a lens out of focus, and so avoid all trouble about pinholes?

The Chairman, after inviting auy member to speak, said that as no one had risen in response, he would make a few remarks first. Capt. Abney had treated in an analytical way what could be arrived at geometrically; he (Mr. Dallmeyer) had tried the latter method, and arrived at the same results. The apertures mentioned by Lord Rayleigh at the British Association had twice the diameter just given by Capt. Abney.

Captain Abney responded that Lord Rayleigh said nothing about what size of aperture would give the best image; he had merely maintained that a pinhole picture of suitable dimensions must be viewed at the distance at which the plate stood from the pinhole, to get rid of the appearance of fuzziness; thus, with a plate at nine feet distance, Lord Rayleigh used an aperture of one-sixteenth of an inch, and said that the resulting photograph should be viewed from the distance of nine feet. He had been searching for the greatest diffusion allowable.

Mr. Elder asked how it was that there was not a greater falling off of the illumination at the margins of pinhole pictures. A ray passing obliquely through the hole practically passes through a smaller aperture than does the central ray.

Captain Abney responded that the mathematics of rays of light passing through ellipses was a complicated subject, which the Camera Club would not thank him for putting before them. With an included angle of sixty degrees, little was lost in brilliancy or definition at the edge of the plate.

Mr. W. Willis asked what would be the result of the use of monochromatic light in pinhole photography, instead of light of all degrees of refrangibility.

Captain Abney responded that with monochromatic light improved definition would be obtaiued, aud that the aperture would probably have to be diuiuished by about one-twenty-fifth. In conuection with stellar photography he used monochromatic light, and a distinct difference in the diameter of the disc resulted; for such purposes he used light half way between G aud F; it was just over the blue lithium line.

Mr. Willis asked what mediuu he would recommeud for getting uonochromatic light by means of interposed glass.

Captain Abney used suitable true monochromatic light from the spectrum; he did not believe in using uedia. Aumonio-sulphate of copper solution gives a band, not a line, and with it interposed, he did not think that the pictures would be either better or worse. Sodium light is not mouochromatic; it gives red, blue, green also, but yellow in overpowering proportion. Lithium was the only substance he knew which would give a light approaching that which Mr. Willis wanted; it could be obtained by using a fairly strong source of heat, just strong enough with chloride of lithium to bring out only the red aud blue lines, aud in photographic work the red could be neglected. With care the oxyhydrogen flame would bring only the red and blue lines out with chloride of lithium, and the blue was perfectly monochromatic. Another way of getting pictures by means of small apertures was by using a fairly minute ring or zone in place of a pinhole, that is to say, something like a large pinhole with an opaque disc in its centre. This plan gives fairly good results; they are as good as with a pinhole of the best aperture, and the time of exposure is shorter under the same conditions of lighting.

Mr. L. E. Clift asked how Captain Abney made the pinholes of the dimensions he required.

Captain Abney did it by means of needles made into punches; he clipped the needles, and measured them micrometrically.

Mr. Lyonel Clark had experimented iu pinhole photography, and found that, generally speaking, his apertures had double the diameters of those used by Captain Abney, but the variation in the pictorial results was not very great. He usually gave about twelve minutes' exposure iu the winter. He had found that special punches were of no partieular use. Wills sold his tobacco in thin tinned sheet iron; the top of one of these tins could be taken, a hole "jabbed" through it with a needle, and the blurred end of the hole turned to the object. At first he made his punches properly from an engineering point of view, with the largest diameter of each at the cutting edge, but afterwards he found that "jabbing" a needle through the top of a tobacco box answered equally well.

Captain Abney had found that plan to sometimes cut off light from the side of the picture.

Mr. William England had found a piece of celluloid dyed black to be an excellent mediuu for piereing to get apertures for pinhole photography.

Mr. George Davison said that there was an advantage in giving long exposures in pinhole photography. Sometimes, with a large pinhole and bright light, the view included can be seen on the foeussing screen. Captain Abney held that the pictures of Alma Tadema were "nearly" as sharp as photographs; that word "nearly" made all the difference. Nine-tenths of our artists can paint sharper than they really do, but omit to do so on purpose; they invariably leave much detail out, which an ordinary photographer tries to get in. He thought uniform out-of-focus to be sometimes exceedingly desirable in landscape work, and better than a plane of sharpness across the picture at a particular distance. The object of relieving any one portion of a picture is to draw special attention to it, but that is not necessary in many cases. As to the advice of using a lens out of focus, he had tried that plan sometimes, and thought the results not to be so good as if he had used a pinhole, but he should prefer a lens if it would do the same work in a shorter time; the pinhole had, however, some advantages. It was neither costly nor heavy. Lenses were wanted into which spherical aberration could be introduced at will.

Mr. Rodgers remarked that Mr. Davison aimed at breadth, and had argued that it could only be obtained by sacrifice of detail. He (the speaker) thought that artists might give minute detail accurately without interfering with the general broad effect.

Mr. Davison replied that artists were the best judges in this matter, and they disliked photographs because they gave too much detail.

Mr. Willis was recently in the studio of a celebrated painter who had before him a picture with its foreground magnificently painted, but he ran his brush, charged with some transparent colour, all over that foreground; this had the effect of subduing it. Could not something of the same kind be done in photography? The eye is satisfied with the first glance at a picture in which the principal object is sharp, afterwards, as in looking at nature, it searches for detail, and is disappointed when it is not there.

Mr. Rodgers said that in the paintings of birds by Mr. Stacey Marks the amount of detail was extraordinary.

Mr. Humphery stated that paintings usually have to be viewed at a greater distance than photographs, and that the former are painted so as to give to those at a distance the appearance of great detail.

Mr. Davison exhibited a pinhole photograph which he said that he considered to be the best he had ever been able to turn out by any method.

The Revd. F. C. Lambert remarked that the whole point seemed to turn upon the words "correct detail." Artists do not want to destroy what is present, but photography in their eyes emphasises detail. He thought that detail should be subdued, and that a picture taken with a small stop gave an impression to the observer not conveyed by the scene itself. That something should be left upon which the imagination could play, was necessary in every work of art.

Captain Abney advised all tourists who went out to lunch, and to take pinhole photographs, to begin the exposure before lunch, and to finish it afterwards, to save time. About the year 1865 he travelled a few hundreds of miles in India to photograph some cave temples, and when he arrived found that he had left his lenses behind him, so happening to know about pinholes as lenses, he made a pinhole of about a tenth of an inch, with which he took some 10 by 12 inch photographs; that was in the wet-plate days. When he mentioned this at the Photographic Society it was hardly believed by one or two of the members, and some comments appeared in the Photographic News throwing doubt upon his statement; upon reading those comments he felt "corked."

Mr. W. H. Harrison: How long ago was that?

Captain Abney replied that it was about the year 1881, and the comments had been made by a mutual friend of theirs. He had forgiven, but had not forgotten. Some of those at the meeting were not sufficiently credulous to accept his statement. However, just afterwards, a photographer—Mr. Henderson—found that he could take pinhole photographs, and that settled the matter. Although science and art have to be combined sometimes, they did not seem to get on very well together, and he did not profess to be more than a humble student of art; his work was in another direction. Perhaps, however, scientific workers might help artists to obtain any amount of fuzziness in their pictures. Whenever, at exhibitions, painters turned out fuzzy pictures, he always looked at the frames, and not at the pictures.

Mr. Dallmeyer said that the sole object of Lord Rayleigh, in his paper read before the British Association, and published in the Photographic News, was to show where lenses became unnecessary. In a picture containing no leading feature or group in one plane, uniform softness all over is admissible; but all views are not of that description, and where there is some object present of particular interest, he thought that emphasis should be laid thereupon. As regards lenses for the purpose, when the apertures are small, there is a difficulty in introducing spherical aberration. A transparent diffraction plate placed across the aperture of the diaphragm will do something in the direction of yielding the desired result. A simple way of making such gratings is to draw a multitude of lines, and then photograph them.

Captain Abney remarked that Mr. Dallmeyer's father had made him a grating containing only one hundred lines to the inch, for use in the photo-heliograph at Greenwich; it certainly gave marked fuzziness.

London and Provincial Photographic Association.

At the meeting on the 1st inst., Mr. J. Traill Taylor occupied the chair.

Mr. H. M. Hastings exhibited a series of silver prints of the exterior and interior of Salisbury Cathedral, recently taken by him.

The question was asked whether varnishing a plate with a coloured substratum, previous to coating, would be a preventative of halation.

The Chairman thought there would be a risk of the colouring matter in the substratum being communicated to the sensitive film; for this reason he would prefer backing the plate.

The Hon. Sec., in developing some ordinary and isochromatic plates, backed, using yellow light, omitted to screen the light during the development of the isochromatic plates; the result was an excellent image of the backing of the film. He had been able, with certain makes of plates, to dispense with both yellow screen and back in copying paintings successfully.

Mr. W. E. Debenham preferred, when copying pictures, to illuminate the room with yellow light; he considered it better than the methods usually adopted, as no optical difficulty was introduced. The exposure, of course, was prolonged.

Mr. A. L. Henderson exhibited a stereoscopic negative of an out-door view taken during his stay in the West Indies. Across the plate was the figure of a hand with outstretched fingers. He said he had several more negatives taken at the same time, all showing this curious phenomenon; he was unable to account for it in any way. He had tried to produce the same effect since by placing his hand in front of the lens during an exposure, but had failed.

Mr. A. Cowan, commenting upon solutions of eikonogen frequently becoming discoloured, showed a bottle about one-third full of a solution of eikonogen that had turned quite black; he also showed another bottle quite full that was perfectly bright and colourless. He stated that the same solution had been poured into each bottle, and the bottles had stood side by side for a month. The bottle containing the dark solution had, during that time, been occasionally opened to take out some of the solution; whereas the other had remained corked and quite full the whole time. He thought this conclusively proved that the darkening action was due to the action of the atmosphere.

Mr. H. M. Hastings showed two lantern slides developed with the new developer graphol; also some bromide prints developed with an acid eikonogen developer, recommended by Mr. J. H. Voight, Chairman of the Photographic Society of Frankfort-on-Maine. It is claimed for this developer that it is rendered more energetic, and its keeping qualities much improved, in an acid condition. This is effected by the addition of hydrochloric acid. Mr. Hastings said he had developed eight plates in the same solution, which remained perfectly clear to the end; the last plate, however, took half an hour to complete development.

Newcastle-on-Tyne and Northern Counties Photographic Association.

At the Central Exchange Art Gallery last Friday evening, a lecture was given by Mr. J. P. Gibson, under the auspices of the International Photographic Exhibition, upon "Northumberland: Its Antiquities and River Scenery." Mr. Gibson, who showed a splendid collection of over 150 of his own lantern slides, at the outset dealt with the pre-historic races who dwelt in Northumberland, and he exhibited a slide illustrative of a hut circle. He proceeded to describe the customs of the people in the early ages, giving a pictorial reproduction of a human skull found in Tarset Burn. Next he dealt with the period of the Roman occupation, which he followed with views of the present day of the camps of Cilurnum, Housesteads, and Birdoswald. The Saxon age then formed the subject of his lecture, and Mr. Gibson illustrated his discourse with photographs of crosses and other antiquities found in the Hexham district. Mediæval antiquities were touched upon. Typical castles were shown, such as Seaton Delaval, Morpeth, Warkworth, Alnwick, Bamburgh, and Etal. Modern topics came

next, and the lecturer, working westward from Newcastle, found opportunity to give views of the birthplace of George Stephenson at Wylam, and Bewick at Cherry Burn. Bywell Church and Castle Aydon Castle, and Dilston were also treated upon. A brief sketch of the Derwentwater family was given. The scenery of the River Tyne and its tributaries was finally shown, beginning below Hexham, up the North Tyne to Bellingham, and on the shores of the South Tyne to Thirlwell Castle. There was a large attendance.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

ADJOURNED annual general meeting, Friday, May 2, at 181, Aldersgate Street, London, the president, Mr. J. TRAILL TAYLOR, in the chair.

The CHAIRMAN said that the business of the evening was the election of officers for the ensuing year. The new rules which had been passed by the meeting held on February 14 had just received the sanction of the Registrar-General of Friendly Societies, and the Association would in future be bound by them.

The following officers were then elected :—

President—Mr. J. Traill Taylor. *Trustees*—Captain W. de W. Abney, C.B., F.R.S., and Mr. W. S. Bird. *Treasurer*—Mr. John Spiller, F.C.S. *Committee*—Messrs. H. D. Atkinson, William Bedford, William Benham, E. Clifton, T. J. Collins, F. W. Cox, T. E. Freshwater, G. T. Harris, A. Mackie, J. D. O'Connor, J. S. Rolfe, and E. A. Whittemore. *Auditors*—Messrs. W. Holt, E. W. Parfitt, H. J. White, and J. W. Zaehnsdorf. The hon. solicitor, Mr. William Benham, was also reappointed, and the election of Mr. H. J. Beasley to the post of hon. secretary confirmed.

The meeting passed votes of thanks to the officers for the past year, and to the hon. solicitor for his special services.

Twelve new subscribers were enrolled.

All communications should be addressed to the hon. secretary, Mr. H. J. Beasley, 65 and 66, Chancery Lane, London.

THE HACKNEY PHOTOGRAPHIC SOCIETY.

THIS Society held its annual soirée on Thursday, May 1st, at Morley Hall, and about 400 visitors were present. Various friends contributed to the entertainment of the company, and the evening was brought to a close by an exhibition of members' lantern slides. The prize winners were Messrs. Fred Evans and Carpenter. The room was tastefully decorated with plants and flags. This concludes the first year of the Society's existence.

BATH PHOTOGRAPHIC SOCIETY.

April 24th.—Excursion to Box and district.

April 30th.—Ordinary meeting, Mr. PUMPHREY, president, in the chair.

Mr. J. A. Howe was elected a member of the Society.

The Hon. SECRETARY announced the receipt of a specially prepared copy of "East Anglian Life," presented by the author, Dr. P. H. Emerson. Some early volumes of the Photographic Society's Journal were also presented by Mr. Wheatcroft. Circulars relating to forthcoming exhibitions at Amsterdam and in the City of London, and other matters of interest, were drawn attention to.

Mr. G. F. POWELL then gave a paper on "Stereoscopic Photography" (see page 355).

The CHAIRMAN, in thanking Mr. Powell for his paper, said it was true stereoscopes had gone out of fashion, but pictures when suitably prepared to be viewed in them appeared more realistic than photographs generally. He thought the angle of base should be kept small, not exceeding the distance between the eyes. Whether the stereoscope would be resuscitated he could not say, but it was possible to purchase a cheap form, with half-a dozen stereoscopic pictures, for a shilling.

Mr. DUGDALE thought the reason stereoscopic photographs fell into disuse was largely due to the pictures being too wide —2½ inches was a convenient size.

Mr. AUSTIN J. KING, vice-president, thought stereoscopic photography might come again to the front if more perfect instruments were provided. The difficulty of adjusting one's sight to a particular form of instrument was an obstacle, for the two eyes do not focus quite the same. If both eyes do not adjust themselves, then the effect of rotundity does not become evident. Another difficulty, into which he would not then enter, was astigmatism.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on May 1st, with Mr. G. G. MACLAREN in the chair.

The manipulations of the new printing process, "Kallitype," were demonstrated. The process was said to be exceedingly simple, presenting few difficulties, to print very fast, and to be moderate in price.

A negative of the font in St. Mary's, Broughty Ferry, was shown. A small portion of two stained glass windows was included in the upper corners of the negative, and on the left side of the font near the foot there was a reflection of a panel of the window to the right. No explanation could be given as to the cause of the reflected image.

The following office-bearers were elected for the session 1890 and 1891 :—President, Mr. John Mathewson ; Vice-Presidents, Messrs. J. D. Cox and W. M. Martin ; Council, Messrs. W. Bertie, W. F. Hill, P. Kerr, G. D. Macdougald, G. G. Maclaren, W. Salmond, A. Stewart, W. D. Valentine, J. Welsh, and T. L. Wynd ; Secretary and Treasurer, Mr. V. C. Baird, Broughty Ferry, N.B.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

AN adjourned stated meeting of the Society was held on Wednesday evening, April 9th, Mr. JOHN G. BULLOCK, vice-president, in the chair.

A communication was read by the Secretary from the editor of the *Photographic Times*, presenting a copy of "Practical Photo-micrography," by Andrew Pringle. The Secretary also reported that, owing to the removal of the Society of Amateur Photographers of New York to new quarters, which would fully engross the attention of both officers and members for some months, it had been agreed to postpone the exhibition until the spring of 1891.

Mr. BROWNE spoke of the loss the Society had sustained in the death of its President, Mr. Frederic Graff, and said that it had seemed to certain of the members desirable that the position of President should be filled at once ; he therefore nominated Mr. John G. Bullock for the office. The nomination was seconded by Mr. F. T. Fassitt, and Mr. Bullock was unanimously elected President.

Dr. MITCHELL, of the Executive Committee, read a communication from Mr. Frank H. Rosengarten, entitled "The "Working Department of the Photographic Society of Philadelphia." The paper was a lengthy plea for enlarging the scope and usefulness of the Society, gave a history of previous efforts which had been made in this direction, and was accompanied by circulars and other data illustrative of the working of the Camera Club, of London.

Considerable discussion followed the communication, during which Mr. BROWNE called attention to the fact that before the end of the year the Society would have to consider the important question of a change of quarters. He thought a special committee might be appointed to consider all propositions made to it, and in this way relieve the Society from a great deal of discussion.

Dr. MITCHELL moved that the chairman appoint a special committee, to consist of the president, vice-president, secretary, and treasurer, and six other members, to consider and report to the Society the advisability of procuring other and more convenient quarters, and the institution and development of a suitable working department for the instruction and improvement of members in photographic work. This was carried.

Mr. CARBUTT, alluding to a letter he had read at a previous meeting, from Mr. Pancoast, in regard to keeping qualities of plates, showed a negative sent him by Mr. Pancoast,

taken recently on a Carbutt A plate which had been coated about 1884 or 1885. The negative showed no signs of deterioration on account of age of the plate.

Mr. BROWNE, referring to the appointment of a committee to ascertain the cause of certain deterioration in lantern slides, said that within the last two weeks he had examined a large number of slides with a table microscope having a two-inch objective. With a glass of this power, he noticed that in many cases the crystallization or cloudiness is formed on the cover glass, but not invariably so. It has been said that much of this difficulty arises from the quality or composition of the glass—that from the thin glass now used both for picture and cover emanates some chemical injurious to the slide. This might be so, but in his experience, which had been almost entirely with the quality known as "B. P. C.," he could not lay this fault to the glass. In examining the slides he found much matter evidently deposited from impure washing water, which seemed to consist of particles of vegetable matter, mud and sediment of various kinds which had not been perfectly washed off. He also thought that the central spots from which the crystallization started were sometimes due to hyposulphite of soda in the gelatine film. Years ago, having trouble of this kind, he had commenced using diluted cyanide of potassium instead of hypo for fixing slides. Slides so fixed did not show any of the faults in question. Much of the trouble, he thought, arose from intensification. The purchasers of commercially-prepared slides demand dense positives, which makes it desirable to use some form of intensification. Among the chemicals used for this purpose is sulphide of potassium, which to his mind is most objectionable. He had found the treatment with bichloride of mercury, followed by a bath of bichloride of platinum, to make a permanent and safe intensifier.

Mr. FASSITT had found the treatment with mercury invariably fatal to a gelatine slide.

Dr. WALLACE thought the question of fading depended not so much on the use of mercury as upon what the mercury was followed by. If ammonia were used, the result would be disastrous; but with cyanide of silver the picture would not fade.

Mr. CARBUTT, speaking of the use of cyanide of potassium for fixing gelatine slides, said it could be used if perfectly pure. The ordinary commercial cyanide contained caustic potash, which had a deleterious effect on the film. He recommended a solution of eight or ten grains to the ounce as suitable for fixing an ordinary gelatine plate with safety.

Mr. ROSENGARTEN said that most of the hypo used contained large quantities of foreign matter and impurities. In his own practice he used only the pure article.

Mr. BELL endorsed the remarks of Dr. Wallace relative to the use of mercury.

Mr. CARBUTT, claimed that there was no need to intensify lantern slides. He had been making some positives requiring great density; it was simply done with pyro, soda, and bromide. The action should be well restrained, and the exposure as full as subject and condition will allow. In the instance referred to nearly a minute elapsed before the image began to show. It was a positive made by contact. For the purpose of those using his process plates, the developer consisted of:—

Water	60 ounces
Carbonate of soda crystals	2 ,,
Sulphite of soda crystal	1 ,,
Bromide of soda or potash	60 grains

To each ounce of the above, 2½ to 3 grains of dry pyro are added. By this means perfectly clear glass in the transparent parts of the negative, and dense blacks, can readily be obtained.

THE GLOUCESTERSHIRE PHOTOGRAPHIC SOCIETY.

ANNUAL meeting, April 28th, 1890: the president, Mr. W. B. WOOD, in the chair.

The president, vice-president, treasurer, and committee of last year were re-elected. Mr. A. H. Church was elected hon. secretary. The retiring secretary, Mr. F. H. Burr, and the Rev. Mowbray Trotter were added to the committee. A warm vote of thanks was passed to Dr. Emerson for his valuable and useful gift, "Pictures of East Anglian Life."

The presentation print for 1890 was selected, the voting being in favour of a 15 by 12 platinum print of a view by W. C. Beetham. A lantern outfit, consisting of a pair of mahogany lanterns, with cylinders, regulators, and jets, was on view, and it was decided to purchase the same for the use of members.

The triennial exhibition (open) will be held in October and November, and prospectuses in accordance with recently expressed ideas will shortly be issued.

PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the above-mentioned Society was held in the rooms of the Geographical Society, Kyo-bashi, Tokyo, on Monday, March 24th, at 1.30 p.m., Mr. EDMOND HOLMES in the chair.

The following new members were elected:—Messrs. R. W. Borthwick, H. Deakin, J. McDonald, C. Pope, T. P. Solomon, and A. C. Stern.

Mr. C. D. WEST showed a number of prints toned by Clark's new platinum toning process. In many cases there were, alongside of the platinum-toned prints, others from the same negatives toned with gold in the ordinary way. The platinum tones were blacker than the gold. There was some difference of opinion as to which were the pleasanter, but on the whole the verdict was in favour of the platinum. Mr. West explained that there was reason to believe the platinum-toned prints to be more permanent than the others. He found it inadvisable to use nitric acid in the bath, as recommended by Mr. Clark, at least with albumenized paper, as it gave yellow high lights. He preferred citric acid, and a bath comparatively weak in the platinum salt. The following formula was given; To each ounce of water add one half grain of chloroplatinite of potassium and four or five grains of citric acid. This bath keeps well.

Mr. A. J. HARE showed a number of prints toned after dissolving a quantity of common salt in any ordinary toning bath. The prints then went direct from the printing frames to the toning bath, and from the toning to the fixing bath, there being no intermediate washing. The following advantages were claimed for the modified process. Less over-printing is necessary; there is considerable saving of time; the tones are richer than when the paper is washed before reaching the toning bath, and there is much less tendency to run to "mealiness" in the shadows in the case of toning to a deep purple or black. The prints shown were done on the ready sensitized paper of the Japan Dry Plate Co., and the tones were pronounced exceedingly fine.

Mr. W. K. BURTON showed a sample of the more recently manufactured eikonogen. He had received a dozen or two of bottles of the substance, and in every case but one the colour of the chemical was nearly white; in the case of one single bottle, however, the eikonogen had turned quite black, although this particular bottle appeared to be as securely luted as the others. Mr. Burton had found this new eikonogen distinctly superior to the old, and considered that it had clear advantages over pyro for some kinds of photographic work.

A demonstration of "Photo-zincography" was then given by Messrs. W. K. Burton and Y. Isawa. This is a process whereby blocks to print type-high can be photographically produced from any line drawing or sketch. A very light print is taken from the negative on common photographic paper, but is neither toned nor fixed. The outline is gone over with a pen and the best quality of Chinese ink, and as much line shading is put in as may seem desirable, after which the print is put in a bath of a solution of bi-chloride of mercury. This quickly makes the photograph entirely disappear, the line sketch only remaining. If a photograph is not to be used the artist sketches directly with black ink on pure white paper. In either case the result is the same, a line sketch that is copied in the camera, the wet process being used by preference. The negative must be reversed, and the reversal is secured either by using a reversing mirror in copying, or by stripping the film of the negative from the glass and turning it over. A polished zinc plate is next coated with a mixture of albumen, water,

and bichromate of either ammonium or potassium, and when dry, is exposed under the negative, a faintly visible image resulting. The plate is then covered with a very thin uniform coating of a greasy ink applied by a roller, and is dipped in water. In a minute or two the ink begins to leave all the plate but those parts representing the lines, and, the action being helped by rubbing gently with a piece of cotton wool, there is soon an image in printer's ink on the zinc plate. The plate is dried, and a quantity of powdered resin is dusted over it; this sticks to the greasy lines, but not to the rest of the surface, and a slight heating is enough to incorporate it with the ink. There is now a sufficient "resist" to make it possible to etch away some of the metal between the lines, and the plate accordingly goes into a bath of weak nitric acid. There is only one reason why the etching should not be continued till the whole of the necessary relief is got at one operation, and that is that the acid has a tendency to "under-cut" the lines. It is, therefore, necessary to protect the edges as well as the tops of the lines. To effect this protection, the plate is taken from the bath after a very little relief has been got, is dried, and is heated just to that point at which powered resin will stick to the lines, but not to the rest of the plate. The plate is then again powdered with resin, and when the lines have taken all that they will, it is heated enough to melt the resin and make it run down the sides of the lines. The plate then stands an etching in a somewhat stronger bath, and the process is repeated five to ten times, according to the coarseness or fineness of the work. The lines thus obtained are firm and solid, but there are generally slight ridges running along the sides of them produced by the different etchings. To get rid of these the plate is cleansed of all resin, and is inked up with a smooth roller which touches only the tops of the lines. The operation of dusting with resin and heating is once more gone through, and the plate has its last etching, or last but one—for it is sometimes advisable to repeat this etching twice—when it is ready to be trimmed and mounted type-high for the printer. Samples of every stage of the process, from the original negative to a block that had been printed in a machine, and prints from them, were shown, and the process of developing the image on the zinc and of etching was demonstrated. The demonstrators explained that it was claimed that the whole process, from the taking of a photograph to the production of a finished block, could be gone through in two hours in England. They doubted this, but could easily do the work in from six to eight hours. The block really could be produced in two hours from the time of taking the exposed zinc plate from the printing frame. They farther explained that the advantage of the process was that an exact copy of any line subject, no matter how complicated, could be made in a few hours, either of the same size as the original, or smaller or larger.

THE publication of several pages of news is postponed until next week, because it has been found impossible to find space for them in this issue.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—First Saturday outing, May 10th, to Waltham; trains from Liverpool Street, 2.5 and 2.50.

THE offices of *l'Amateur Photographe* and of the *Bulletin des Sociétés Photographiques de France* have been removed to 24, Boulevard Saint-Germain, Paris.

THE British Museum (South Kensington) authorities have this week ordered a large number of Mr. Gambier Bolton's animal studies from life and skeleton series, to be framed and hung in the galleries of the Geological section; this is one of the first instances of the kind on record.

SHEFFIELD CAMERA CLUB.—The usual monthly meeting was held on the 25th April, when a students' night was given. Members were invited to bring objects of interest to be discussed by those present. A number of negatives were developed by several of the members.

THE formula of the acid eikonogen developer mentioned by that able experimenter, Mr. H. M. Hastings, at the meeting of the London and Provincial Photographic Association, was published some weeks ago in these pages in one of Dr. Gunther's articles, and seems to deserve practical attention.

Answers to Correspondents.

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

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

E. H. M. (Plymouth).—*Combined Fixing and Toning Bath.* With reference to Mr. R. E. Liesegang's toning bath, described in the NEWS of 25th ult., page 322, we should not be inclined to say that it would be permanent, for one cannot have hypo and gold together in the same solution without some of the gold separating out as a black deposit on standing, even in the presence of the sulpho-cyanide. Used immediately, as directed, it would tone quickly and fix the prints at the same time. See the first answer to an Irish correspondent in the NEWS of April 11th for a good toning bath for Aristotype, which could be used until exhausted, and be content to fix in a separate bath.

A. B. (Bishops Stortford).—*Portable Developing Tent.* The lightest and best material is a thin black mackintosh, such as used for overcoats, but this does not bear sun exposure very well or hard usage. A top covering of canary fabric would help to protect it. We are not acquainted with any paint or varnish that can be relied upon to keep out the actinic rays, when the material has to be constantly folded. A double fabric of black and yellow calico, or red union, is sometimes employed.

T. S. (Carlisle).—*Collodio-Chloride Prints.* 1. In the absence of details we can only say that the prints are excellent, and the process seems capable of giving vigorous impressions, like albumenised paper. One of the prints is iridescent; is this intentional, or the result of employing too thin a film of collodion? 2. The process would appear to be capable of professional employment like the Alpha paper.

L. T.—*Thermometer Scales.*—Your doubts are resolved by looking at the thermometer table at the end of the YEAR-BOOK. The 18 degrees evidently mean Centigrade, and are equivalent to 64½ degrees Fahrenheit, which is a manageable temperature at this season of the year.

S. M. (Brighton).—*Ammonia in the Camera.* Without trying the experiment, we cannot say whether the diffusion of ammonia fumes in the camera would have the effect of expediting the exposure with gelatine plates. It should be easy to test the point for yourself with brown paper, or an old blackened sponge, slightly moistened with ·880 ammonia, and placed within the camera. When ascertained, we should like to know the result.

MOUNTER.—*Chocolate Cards.* The colour may very possibly bleed out if you use oil of cassia in your starch paste, for the essential oils are powerful solvents of organic colouring matters. Encaustic paste, although containing these aromatic bodies, does not act in the same way, because of the protection afforded by the wax.

M. S. T.—*Operators' Specimens.* The question was threshed out a few weeks ago in the NEWS. There is no alternative but to accept the statement that they are the *bonâ fide* work of the applicant. We have known instances of high-class professional work being openly shown in specimen cases other than those of the real producer; the prints of an eminent Dublin firm being sometimes shown in London to attract customers.

RECEIVED:—Notices of the Chester Meeting of the Photographic Convention, June 23rd to 28th inclusive, C. H. Bothamley, F.C.S., President; and Camera Club exhibition of Photographic pictures by the late Mrs. Julia Cameron, now on view; of the lecture on "The Photographic Image," to be delivered by Professor Meldola, at the Royal Institution, on Friday, 16th inst.; also copy of "A Proposed Photographic Survey of Warwickshire," by W. Jerome Harrison, F.G.S., which has already appeared in our pages.

ADELPHI.—*The Lantern Society's Display* last Friday week was chiefly remarkable for the excellence of the electric lighting employed in the lantern, which gave a steady and brilliant image upon the screen. The high quality of most of the slides likewise contributed to the success of the exhibition.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

SOME OPTICAL CAUSES OF DEFECTIVE PHOTOGRAPHS.

THE optical cause of a curious defect which on rare occasions is found in negatives, was stated by Mr. Dallmeyer at a meeting of the Photographic Society last Tuesday night, and the information seemed to be new to most of those present. He said that each concave surface in the elements of any lens, which surface faces the sensitive plate, acts as a concave mirror throwing back some light upon the plate, and occasionally even a definite image. Mr. William Bedford remarked that he had sometimes been troubled by this defect, especially when taking interiors, a window in one part of the picture being sometimes faintly reproduced upon another part of the picture where it was not required, and he thought that Mr. Dallmeyer had satisfactorily explained the cause of the mystery.

One thing escaped the notice of the meeting, and that was the influence which the sensitive plate itself has upon the phenomenon, for it is evident that under the same circumstances a better negative should be obtained upon a matt-surfaced gelatine film than upon a bright surfaced gelatine film. The latter would tend to act as a polished plane mirror, and to increase the defect, besides wasting useful light which ought to be doing work inside the film. The matt-surfaced film would absorb more light, and that which it reflected would be more scattered in all directions inside the camera, than in the instance of a film with a better reflecting surface. The influence of the surface of the sensitive film upon the phenomenon, therefore, deserves experimental investigation.

Another cause of imperfections in photographs, to which too little attention is paid at present, then occupied the attention of the meeting, namely, the want of care commonly exercised in not screening the front of the lens from light not required to form the picture. Mr. William England called special attention to this in the wet-plate days when he was photographing in Paris, as we remember from having been so struck at the time by his advice as to have at once had one of the old-fashioned stereoscopic box-cameras in our possession fitted with an adjunct to comply, as far as possible, with the recommendations which he laid down.

What is desirable is, that the lens of a camera shall look through a rectangular aperture or "window" in front, which aperture shall cut off all light but that required to form the picture, and to get the best results in this way it is evident that the aperture should not be too close to the lens; it should be at that distance at which the straight edge of an opaque object would not photograph with too large a penumbra from its out-of-focus position. The screening of the lens from unnecessary light from the sky is of more importance than screening it from light coming from any other direction, and the plan is as useful in the studio as in the field. A little tunnel formed in front of the studio camera by black curtains also fulfils the function, as pointed out by Mr. Debenham, of reducing the number of brightly illuminated floating particles in the air between the camera and sitter. These particles reflect light into the lens, so the shorter the length of illuminated dirty air between the sitter and the lens, the better.

To one point of this subject, again, attention was not given by the meeting. It is not alone necessary that the rectangular aperture should be far enough from the lens to work with reasonable efficiency, but the power must exist of being able to shift the position of the aperture in a plane parallel with that of the camera front, in order that when the rising or falling front is brought into play, the whole system, including plate, lens, and rectangular aperture shall be properly centred.

We have often thought that the flat, vertical platform formed by the wooden face of the shutters of the Kershaw type, might be utilised by affixing thereto a suitable arrangement for giving a rectangular aperture well in front of the lens. The platform itself is already a little distance in front of the lens-hood, and more distance might be gained by suitable construction of the adjunct, which adjunct should be made of aluminium or other light material.

DIRECT PLATINUM PRINTING.

MR. OTTO SCHOLZIG has sent us some specimens of Dr. Jacoby's direct printing platinum paper, which has the usual characteristics of papers in which platinum black is thrown down by the agency of a ferric salt when acted upon by light, a class of papers in the preparation of which we have done a considerable amount of experimenting. We find that Dr. Jacoby's paper, like the others, requires a good light if fair rapidity be required in the printing, that vigorous negatives suit it best, and that excellent pictorial results can be obtained with it if attention be paid to the necessary conditions.

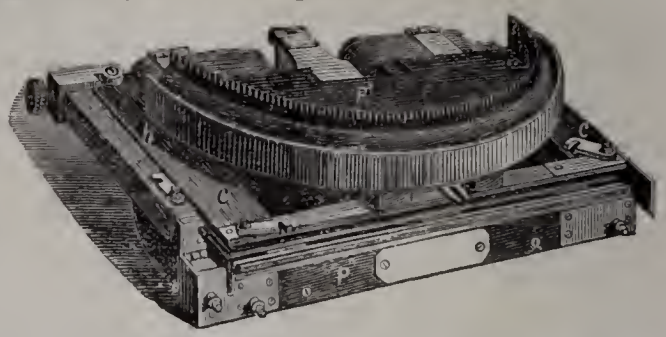
Dr. Jacoby recommends operators to keep the paper tightly pressed in a very dry and cool place, excluding air as much as possible; chloride of calcium tins are the best receptacles for this paper. Clear negatives with plenty of contrast and detail give the best results. He also says that in very dry weather the paper should be slowly passed over the steam of boiling water before putting in the printing frame, as the paper, when dry, will not print out to the full depth without the assistance of some slight moisture. If the paper be put in the frame quite dry, only a faint image will be obtained, which, after all details are faintly discernable, can afterwards be developed to the required depth by holding it over steam. In a damp atmosphere the paper will contain sufficient moisture, without steaming, to obtain the desired depth in the printing frame, and it is by fully printing-out in the frame and in good light that the best black tones are obtained. The pad of the printing-frame should be of india-rubber or other waterproof material to prevent irregularity in the depth of the picture. Prints of sufficient depth obtained either by direct printing in the frame, or by intensifying by steam, are to be put into two baths of diluted hydrochloric acid. The first, 1 part acid to 75 of water, five minutes; the second, 1 part acid to 50 of water, five minutes; then wash in water for fifteen minutes, till all traces of yellowness in the high lights have disappeared. Printing as well as fixing should be done on the same day.

A word of caution may be added about the steaming of the paper, when it is necessary. If this be overdone, and the paper made too damp, it is liable to stick to the negative at places, and to cause stains; hence it is safest to give too little rather than too much steaming, and to use varnished negatives.

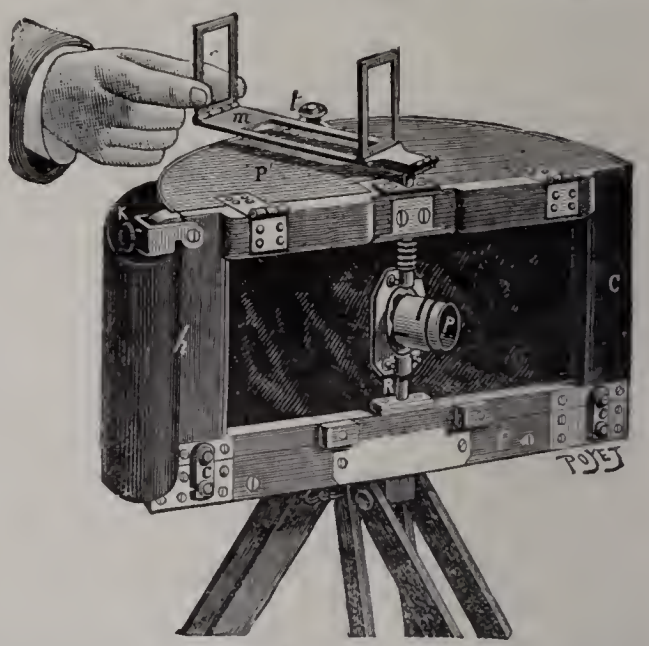
The advent of all direct printing platinum papers is to be welcomed, for it is high time that all photographic work should be as durable as that executed by means of printing ink, and that photographs liable to fade should be things of the past.

MOESSARD'S CYLINDROGRAPH.

MESSRS. GEORGE HOUGHTON AND SON invited us to inspect Moessard's Cylindrograph, a French panoramic camera, which was introduced a month or more ago into the United States, and is now obtainable in London. The instrument has certain points of resemblance to Johnson's pantascopic camera, but the motion is given by hand, and the image is thrown upon a curved surface, consisting of an Eastman flexible film in a flexible dark slide; the slide, with the film inside, bends like a long sheet of thick cardboard. In reply to our inquiry whether different parts of the plate received the same exposure when the latter was given by hand-power, the answer was that best method of exposure for uniformity is to move the handle backwards and forwards two or three times, with a short quick motion.



If it be desired to give more exposure to one end of the film than to the other—which may be the case with some subjects—it can be done, and this power the pantascopic



camera did not possess. Moessard's instrument is exceedingly light for a camera of the class, and it will give the complete circle of the horizon upon 2½ films, which means the use of three films in so doing. A doublet lens of eight inches focal length is employed, and the best parts of the lens are chiefly engaged in forming the whole picture in cameras of this class. Lightness for this class of camera, and simplicity, are the chief features of the instrument, illustrations of which are given herewith.

THE LONDON CHAMBER OF COMMERCE.—Mr. Kenric B. Murray, secretary to the London Chamber of Commerce, sends us an advance proof of the invitation card for the opening *soirée* of the City Photographic Exhibition. Its size is 9 by 6 inches, and represents a lady not dressed for the *soirée* standing by the river side arranging her back hair under cool conditions, whilst a number of little Cupids on the other side of the river are photographing her with a big camera which hampers them sorely; indeed one has to stand upon the back of the other to reach the focussing screen. The original of the clever design, as we happen to know, was scratched off-hand on blotting paper by one of the rising geniuses of the photographic world, whilst another genius present aided with his remarks; but we do not feel at liberty to give names without previous sanction.

CONVERSAZIONE OF THE ROYAL SOCIETY.

PHOTOGRAPHS AT THE RATE OF ONE HUNDRED PER SECOND—THE APPARATUS EMPLOYED—FALLING WATER DROPS PHOTOGRAPHED AT THE RATE OF TWENTY PER SECOND—PHOTOGRAPHY AN AID TO FORESTRY—NEW APPARATUS CONNECTED WITH POLARISED LIGHT—A NEW DIRECT-VISION PRISM SUITABLE FOR THE LANTERN—PHOTOGRAPHS OF THE SPECTRUM OF THE NEBULA IN ORION—STELLAR PHOTOGRAPHS—CLUSTERS IN THE SWORD-HANDLE OF PERSEUS—ALUMINIUM AND ITS ALLOYS—PHOTOGRAPHS OF THE EGGS OF THE GREAT AUK.

LAST Wednesday night, at a *Conversazione* of the Royal Society, Burlington House, Sir George Gabriel Stokes, Bart., M.P., President of the Society, received the members and the invited guests. Many of the objects of scientific interest, displayed in rooms of the Society, indicated the great utility of photography in various branches of science.

Mr. C. V. Boys exhibited some apparatus of considerable interest to photographers, by which he had taken negatives of an electric spark at the rate of from 80 to 100 per second, which is found to be the most convenient speed in practice, although the apparatus will make 2,000 or more exposures per second if need be. This is a modification of the method employed by Dr. Oliver Lodge to show the oscillatory nature of an electric spark formed under proper conditions. Six lenses are mounted on a disc, and are made to rotate; each forms upon a screen an image of the spark, which is drawn out by the movement of the lens into a broken band of light. The lenses are not at exactly the same distance from the axis, so that the band formed by one is not overlapped by the band formed by the next. Thus, the whole duration of the spark, from the first to the last oscillation, is observed or photographed. Single achromatic lenses are used in the revolving wheel, in fact they are the front lenses of opera-glasses; the small wheel carrying them is driven by multiplying gear, and can be made to turn with such velocity as to emit a musical note.

He also exhibited some photographs showing the formation of water-drops, taken, some at the rate of 14, and others at the rate of 20 exposures per second; the rate of 14 per second was rather too slow.

Water drops, half-an-inch or more in diameter, were allowed to slowly form and break away in a liquid of slightly lower specific gravity, namely, a mixture of paraffin and bisulphide of carbon. Photographs of these were taken as follows: they were illuminated by an electric arc and large condensing lenses, a camera was placed in front, and the view was rendered intermittent by a card disc with one hole near the edge made to rotate at from 14 to 20 turns a second. The exposure was about one eight-hundredth of a second. Forty inches of photographic plate were arranged in a long slide which could be drawn past by hand. Three of these multiple photographs were exhibited last Wednesday. The thaumatrope was made by sticking the separate parts of the last series round a card disc, and afterwards painting the surface black and white, following the outlines of the photographs exactly.

The thaumatrope, anciently so-called, clearly shows the gradual formation of the drop and the spherule, the oscillation of the pendant drop immediately afterwards, the rebound of the spherule from the pendant drop, the oscillation of the large drop as it falls, and its rebound from the water below into which it fell.

Other photographs exhibited were shadows of water jets cast upon a photographic plate by the action of a small distant spark, a method invented by Mr. Chichester Bell.

The remainder were photographic shadows cast by a water jet upon a rapidly moving plate by the intermittent light of an oscillating spark. These clearly show the movement of the separate water drops.

Mr. Boys, who is a Fellow of the Royal Society, and demonstrator to the Physical Society, always has something especially attractive to show at these Burlington House gatherings.

The Royal Meteorological Society exhibited the collection of photographs of meteorological phenomena described in these pages a month or two ago.

Professor H. Marshall Ward, of the Forestry School, Cooper's Hill, near Windsor, exhibited a selection of lantern slides enlarged from photomicrographic negatives, remarkable for their freedom from defects under the difficult conditions of production. The transparencies showed (1) the habits, and other peculiarities, of various trees from different parts of the world; (2) the comparative structure and anatomy of several European timbers; and (3) some of the more prominent features of diseases of wood, and fungi causing them.

Professor Sylvanus P. Thompson exhibited an optical rotator. This apparatus is for rotating the plane of polarization of light, and is intended to be used in conjunction with polarizing reflectors (black-glass mirrors and the like), which do not admit of being bodily rotated around the axis of the beam of light. The principle of the new rotator consists in the employment of two quarter-wave plates of mica, one of which is fixed at 45° across the plane-polarised beam of light, which it thus converts into circularly-polarised light. The second quarter-wave plate, which can be rotated by a simple gear, reconverts the circularly-polarised beam into the plane-polarised light, vibrating in any desired azimuth.

He also exhibited a new and simple straight-vision prism of value for use with the optical lantern and for other purposes; it is partly liquid and partly solid, and so constructed that much less light is lost by reflection from surfaces than in the case of direct-vision glass prisms. It consists of a single prism of Jena glass, of very wide angle, immersed in cinnamic ether. The materials having identical mean refractive index, rays of mean refrangibility pass straight through, but others do not, consequently a spectrum is obtained.

He also exhibited a natural diffraction-grating of quartz. This specimen of iridescent quartz exhibits diffraction-spectra corresponding to those of a grating ruled to 12,000 lines to the inch. A micro-photograph taken by Mr. C. L. Curteis, with a Reichert's apochromatic (3 mm.) lens, shows the nature of the minute structures of the specimen. For the sake of comparison, a diffraction grating of 6,000 lines to the inch, photographed on glass, was exhibited beside the piece of quartz.

Professor Sylvanus Thompson also exhibited a number of flat bottles, each containing two liquids, incapable of mixing, placed over one another. They were chosen so that each liquid absorbs all the rays that the other one can transmit. Though each was transparent, they were jointly absolutely opaque; they were also opaque when shaken up together.

Mr. J. Norman Lockyer exhibited photographs of the spectrum of the nebula in Orion. These photographs were taken in February with the 30-inch reflector at Westgate-

on-Sea; the exposures varied from two to three hours. The one taken with three hours' exposure (February 10th) shows abont fifty lines between λ 500 and λ 373, but many of them are only visible with difficulty, especially in artificial light. The Henry Draper Memorial photograph of the spectrum of P Cygni was shown for comparison, and it was seen that all the bright lines are amongst the brightest in the nebula. This argues in favour of the view that stars with bright-line spectra are of a nebulous character.

He also exhibited a photograph of the arc spectrum of manganese, showing the use of silver poles in eliminating impurities. This was one of a new series of photographs used in the preparation of a new map of metallic spectra with relation to the sun, Rowlands' photographic map of the solar spectrum forming the basis. The purest salts obtainable are volatilised in the electric arc between silver poles, and in this way the impurities contained in the ordinary carbon poles are eliminated. The silver poles were kindly prepared by Prof. Roberts-Austen, of the Royal Mint.

Mr. Lockyer lastly exhibited photographic comparison spectra of sun and arc, in the region *b* to *B*. These comparison photographs form part of a new series intended to cover the region which has hitherto been mapped by eye observations alone. The plates used were ordinary gelatine dry plates, treated with cyanine and erythrosine.

Professor W. Grylls Adams exhibited a new measuring polariscope, for measuring the angles between the optic axes of biaxal crystals.

Mr. Isaac Roberts exhibited some stellar photographs, one of which was a photograph with two exposures of the plate—the first of two hours' duration on the 29th January, and the second of two and a-half hours' duration on the 3rd February, 1889, the interval between the exposures being five days. The photograph is intended to illustrate a method for detecting variability in stars during short periods, and it indicates that ten faint stars in the region of the great nebula in Orion have changed in magnitude to the extent of from one-fourth to two-fifths the measured photographic diameters of the stellar images during the interval between the dual exposures.

We asked Mr. Roberts how he knew that the differences were not caused by minute local areas of lower sensitiveness of the gelatine plate. He admitted that more experiments were necessary to remove photographic doubts, and will hereafter have to be made, but a difficulty is that the opportunities for taking such photographs are of rare occurrence.

Mr. Roberts also exhibited a photograph of the two clusters in the sword-handle of Perseus, showing remarkable coronal and festoon-like groupings amongst the stars on several parts of the photograph. These clusters are quite free from nebulosity, and in this respect they differ from other clusters which he has photographed; for those clusters are involved in faint but distinct nebulosity.

Sir Henry Roscoe exhibited some specimens of aluminium and alloys manufactured by the Aluminium Company. They included—pigs of aluminium, 99 per cent. pure; castings in aluminium, rough and finished; specimens of aluminium, soldered; aluminium wire, sheet and drawn rod; aluminium medals, plain and gilt; cast aluminium bronze and brass, showing (*a*) tensile strength and elastic limit, (*b*) twisting stress, (*c*) thrusting stress, long specimens, (*d*) thrusting stress, short specimens; stamping in aluminium bronze, rough; 10 per cent. aluminium bronze, twisted cold; 5 per cent. aluminium bronze, worked hot and cold; aluminium brass, worked hot and cold; aluminium bronze and brass sheet.

Lord Rayleigh exhibited the polarisation of light by chlorate of potash crystals, also an instrument for testing colour vision.

Mr. Edward Bidwell exhibited 106 photographs of the eggs of the great auk. There are 67 recorded eggs of this extinct bird, of which 45 are in Great Britain, and 11 in France. The collection of photographs exhibited consisted of two views each of 53 of these eggs, photographed to scale by professional photographers under the personal supervision of Mr. Bidwell.

Dr. H. C. Sorby exhibited Chætopodæ, Medusæ, Ascidians, Nudibranchs, and other Invertebratæ, prepared as lantern slides, showing not only the general form, but also much of their anatomy. He says that some details may be brought out to greater advantage by means of a properly developed photograph.

PHOTOGRAPHIC LENSES.*

BY THOMAS R. DALLMEYER.

II.—The Best Selection of Curves Ascribed to the Material.

In photographic lenses the curves ascribed to the lenses are spherical, and this form of curve gives rise to what is known as spherical aberration or error, and its effects in single (uncombined or uncorrected) lenses are (*a*) indistinctness of the image formed for the axial pencil, (*b*) curvature of field, (*c*) astigmatism, (*d*) distortion. A perfect photographic lens would be corrected for all these errors; the corrections are approximated by combinations of lenses, and we will proceed to examine the conditions best suited to accomplish each.

(*a*) We have seen that no single lens can be made free from chromatic aberration, nor can it be free from spherical aberration. For a given material of definite refractive index the transversal and longitudinal measurements of the aberration vary with the shape of the lens, and, again, the spherical aberration varies with the aperture and the index of refraction of the glass.

For convenience in arriving at accurate results, it is best to separate the smaller errors, shown by a second approximation, from the main or first approximation. Thus, to arrive at a first approximation, we have the well-known formula connecting the radii and refractive index of the material with the focal length:—

$$\frac{1}{f} = (\mu - 1)\left\{\frac{1}{r} + \frac{1}{s}\right\}$$

Then, in a second approximation, we have two additional corrections to consider, viz., the thickness of the lens and the measure of aberration, t being the thickness, and y the semi-aperture—

$$\frac{1}{f} = (\mu - 1)\left\{\frac{1}{r} + \frac{1}{s}\right\} - \frac{(\mu-1)^2}{\mu}\frac{ft^2}{r^2} - \frac{\mu - 1}{2\mu^2}$$

$$\left\{\frac{1}{r^3} + \left(\frac{1}{s} + \frac{\mu+1}{f}\right)\left(\frac{1}{s} + \frac{1}{f}\right)^2\right\} f^3 \frac{y^2}{f} \ldots (2)$$

the negative signs indicating a diminution of the first approximate value.

The third term cannot be made nothing for any known material, but it is interesting to make this quantity a minimum with definite media of different refractive indices.

* Continued from page 363.

In most text-books this is done for glass of the nominal refractive index $\mu = 1{\cdot}5$. Taking a definite focal length and aperture for parallel rays, we have to decide what values to ascribe to the radii r and s, to satisfy the condition.

Calling the reciprocals of the focal length and the radii F, R, and S, we have

$$R = -S + \frac{F}{\mu - 1},$$

and using this notation,

$$R^3 + [S + (\mu + 1)F](S + F)^2 = \text{minimum}.$$

Differentiating, and substituting

$$-1 \text{ for } \frac{d R}{d S},$$

$$-3R^3 + 2[S + (\mu + 1)F](S + F) + (S + F)^2 = 0$$

and substituting again

$$-S + \frac{F}{\mu - 1} \text{ for } R$$

we get

$$\left\{ \frac{6}{\mu - 1} + 2\mu + 6 \right\} S = \left\{ \frac{3}{(\mu - 1)^2} - 2\mu - 3 \right\} F$$

here if $\mu = 1{\cdot}5$, $21S = 6F$, and hence

$$\frac{1}{s} = \frac{2}{7f} \quad \frac{1}{r} = \frac{12}{7f} \text{ or } r : s :: 1 : 6;$$

commonly known as the crossed lens.

Supposing the refractive index were higher, say 1·6, here $r : s :: 1 : 15$ to satisfy the above condition, and the lens assumes a shape nearer the convexo-plane lens.

For a given glass of known index of refraction, and assuming various ratios between the radii of curvatures, we can from equation (2) find at once expressions that show the amount of aberration in any chosen form. In speaking of lenses it is essential that the term used to describe the lens should define the surface on which the pencil of rays is incident; thus, a plano-convex lens means that the rays are incident upon the plane side, and a convexo-plane lens that the rays are incident upon the convex side.

Now taking the usual table thus calculated for ordinary forms of single lenses (for parallel rays), in which the refractive index $\mu = 1{\cdot}5$, and including the correction for thickness, let us see what we can learn here.

	Distance of least circle of aberration from approximate focus.		Diameter of least circle of aberration.	
Plano-convex lens	$\frac{27}{8}$	$\frac{y^2}{f}$	$\frac{9}{4}$	$\frac{y^3}{f^2}$
Equi-convex lens	$\frac{1}{6}t + \frac{5}{4}$	$\frac{y^2}{f}$	$\frac{5}{5}$	$\frac{y^3}{f^2}$
Convexo-plane lens	$\frac{2}{3}t + \frac{7}{8}$	$\frac{y^2}{f}$	$\frac{7}{12}$	$\frac{y^3}{f^2}$
Crossed lens	$\frac{24}{29}t + \frac{45}{56}$	$\frac{y^2}{f}$	$\frac{15}{28}$	$\frac{y^3}{f^2}$

We see that in each change of form the position and diameter of the least circle of aberration differs; the longitudinal aberration increases or diminishes as the square of the diameter of the aperture, and inversely as the focal length, and the least circle of aberration is proportional to the cube of the aperture, and inversely as the square of the focal length. Thus, for two similar lenses, in radii and glass, but one having twice the diameter of the other, the larger lens will have a longitudinal aberration four times as great, and the least circle of aberration will be eight times as great; and again, of two lenses of the same aperture, but one double the focal length of the other, the longitudinal aberration will here be the half (or inversely as the focus), and the diameter of the least circle of aberration the quarter (or inversely as the square of the focus).

Thus, to diminish aberration in a single lens, the only remedy is to stop it down, but this can never entirely cure it. Now, with a given material we have for a definite focal length the best form to ascribe to the lens to reduce the aberration of the central or axial pencil to a minimum, and we can further improve this by stopping the lens down. For photographic purposes we have now to consider the best form to ascribe to this lens to fulfil the other conditions that are also required for the formation of a distinct image. These investigations with a single lens are fully dealt with in Sir G. Airy's paper, "On the Spherical Aberration of Lenses," and for a fuller investigation I must refer you. The steps necessary are (1) to find proportion of the tangents of the angles made by the axis of a pencil with the axis of a lens before and after refraction; (2) the distance from the lens of the plane perpendicular to the axis of the lens at which the convergence of the rays, in a perpendicular or vertical plane, takes place; and (3) the distance from the lens of the plane perpendicular to the axis, and in a horizontal plane at which the convergence of the rays takes place. The difference of the positions of these planes of the primary and secondary foci gives rise to the effect of astigmatism. A geometrical illustration will probably explain the matter more clearly, and I think you will find these preliminary investigations of considerable use in the more complicated ones of combinations and systems of lenses to be dealt with later.

The effect of astigmatism in lenses appears to be little understood, so I offer you the following practical interpretation of the theoretical deductions above referred to in connection with Sir George Airy's admirable analytical treatise.

It has been frequently asked what coma and astigmation are. Coma is astigmatism, the vertical focal plane being corrected pretty accurately throughout the plane of the image, but the horizontal focal points being situated, off the axis, in very widely-different planes.

Take the plano-convex lens and the convexo-plane lens with a plate having a narrow slit cut across it in conjunction with the lens.

Now, in either case the vertical plane off the axis will have a certain curvature of the field, but the image for the oblique pencils will be distinct (in a sense). Now, if the plate be turned so as to take the horizontal focal plane at positions where the image was distinct for the vertical focal plane, it is no longer so for the horizontal plane, but a very strong coma is visible; with the plano-convex lens coma-*out*, and with the convexo-plane coma-*in*. Now, the vertical plane has less curvature of field than the horizontal, so that by cutting off the horizontal and using the vertical, coma ceases.

I may mention here that if astigmatism in a single combination or any system of lenses were entirely cured, there should be the same focus for both planes.

In testing lenses for astigmatism, this is a very powerful method of finding the amount. The effects of observing a point of light are very interesting, as is also the use, in double combinations, of an astigmatic stop.

(*To be continued*).

London and Provincial Photographic Association.—May 22, Mr. J. Traill Taylor will give a paper on "The Ethics of Photography."

THE ROYAL ACADEMY OF ARTS, 1890.

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

Gallery No. 2.—On entering the second room we soon find a small picture from which to take a hint, No. 106 ("This Little Pig went to Market," J. T. Ross); note the unity of the group, and not one of them staring at the camera; *i.e.*, spectator—one face, or rather a part, is only seen. The subject is not one of any great rarity.

No. 109 ("May Day Morning," E. A. Abbey). We wonder if that "cock o' the walk" is only just waking up; it seems "too quite too" early, and something like general fog all over the pla—— canvas.

No. 110 ("The Abyss," J. T. Nettleship), "a quick plate and shutter." We only hope we may never see "the likes o' you" in nature: too suggestive of an after-a-lobster-supper-dream.

No. 115 ("Luxor," J. Farquharson). Note the strong values and sharp shadow—contour of strong sunlight.

No. 117 ("Bp. S. Alban's," W. W. Ouless, R. A.) is a vigorous portrait, but brings to mind the expression "as fresh as paint." Time will improve this painting.

No. 123 ("After Waterloo," A. C. Gow, A). As a general rule, we do not care for the usual gaudy glare of so-called military pictures, but this certainly is well worth careful study. The feeling of the general hurry-along, "the rush" under subdued excitement, is skilfully expressed. Note the general unity of the sub-groups, the diversity of expression under a common stimulus—the "order in disorder"—the general "go" of the whole picture, and yet all in a subdued key.

Nos. 124 and 666 ("Bp. of Durham, Dr. Westcott," "Late Bp. Durham, Dr. Lightfoot," both by W. B. Richmond, A). It is a melancholy and striking coincidence that within the same building, and from the same brush, we should have two bishops of the same see, and that these should be the two most justly-renowned scholars that the world has known. It is difficult to say which is the better likeness, for both are most masterly, and both very fine examples of the portraitist's art.

No. 131 ("Sandy Margin of the Sea," B. W. Leader, A). We like the sandy foreground much the best, for the distance is not distant enough to please; note that *some* of the foreground blades of grass and bits of "sea holly" are painted in detail, and others suggested only.

No. 143 ("Our Village," H. Herkomer, A.); and everyone of course asks, "Is it bushy?" Anyhow, it contains plenty to look at; at first one feels the groups are rather scattered about, disconnected, a village divided against itself. Note the kindly old grandfather and child; the boys enjoying the pleasures of imagination at "the" shop, and the prosperous buxom dame at the door. The red-haired girl in foreground seems a bit above her station in life, but is a fine study all the same. We don't quite realize "that house," at least not the hind part thereof, but suppose it's all right. Of the three sons of toil, the middle figure seems the nearest to our experience and idea of the working man. The foreground—and here we do really mean the foreground—might have been cut up a bit, wheel marks, &c., with possible advantage.

No. 150 ("A March Gloaming," J. L. Pickering) is a pleasant study—sombre in tone, quiet, broad, and simple, and we imagine might have been still more pleasing with a less noisy sky.

No. 151 ("How the Gossip Grew," F. D. Millet) contains much good still life painting, and yet, on the whole, is not satisfactory, possibly a case of "too much focus;" too much to carry away the eye from the leading theme; hence a note of warning!

No. 156 ("Cloud Chariots," W. A. Mackworth). The artist here gives a free lesson to some of his not very distant neighbours on the walls; although there is still wanting that feeling of the "arching vaults of canopied heaven."

No. 160 ("E. A. Waterlow, A.R.A." by L. Alma-Tadema, R.A.), interesting chiefly as being a portrait of one well-known painter by another equally "if not more so."

No. 166 ("Solitude," by the President) we reserve for the present.

No. 168 ("Evening," F. W. Jackson). The effect is quite in agreement with its title—quiet, calm, restful, and the sky pleases us well.

No. 175 ("Moonlight," &c., H. J. Stock). The poetic title prepares us for something rather weird, uncanny, and makes us repeat that we do not often see a picture lighted by sunlight which conveys the effect of moonlight.

No. 177 ("Karnac," J. Farquharson); see note on No. 115. These wonderful temple remains, all leaning over to the left, make us think about swing-backs, spirit levels, &c., and altogether leave an uncomfortable feeling of something wrong. Before leaving this room there is yet another picture, No. 129 ("If," Theodore Cook), which may be well seen from some little distance. The interior of a work room, with a lonely toil-burdened occupant at a sewing machine; the broken chair, and care-worn face, general surroundings, tell a tale, without words, of privation—gloom, doubt, if?

(To be continued.)

A STANDARD METHOD OF DEVELOPMENT.*

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

Coming now to a consideration of the alkali to be used, ammonium carbonate may at once be rejected because of its great instability. Potassium carbonate has certain advantages over the sodium salt, but is less easily obtained pure, and is very hygroscopic. This last property renders its use impracticable to anyone but a chemist. Our choice therefore lies between sodium carbonate and ammonia. The former has the advantage of much greater stability, is readily obtained pure, and can be kept in well closed bottles without undergoing change. Sodium carbonate is commonly met with in three forms: the ordinary crystals, or decahydrate, Na_2CO_3, $10H_2O$; the crystalline monohydrate Na_2CO_3, H_2O, formed when the preceding hydrate is exposed to air until it crumbles to fine powder, and ceases to lose weight; and the anhydrous salt, Na_2CO_3. The molecular weights of the three compounds are respectively 286, 124, and 106, and hence one part of the anhydrous sodium carbonate is equivalent to 1·168 part of the monohydrate, and to 2·698 parts of the decahydrate. It is difficult to obtain either of the hydrates of absolutely definite composition, and consequently the anhydrous salt should be used.

Anhydrous sodium carbonate can be purchased of a high degree of purity, but, as a rule, will require drying at 150° C. or 300° F. It is best made by heating pure

* Continued from page 352.

* Continued from page 356.

sodium bicarbonate (sodium hydrogen carbonate) at 150° C., which expels all water and excess of carbonic acid, but does not produce any sodium oxide. The anhydrous salt should be kept in a bottle closed, preferably, with an india-rubber cork. It will absorb water again if exposed to air.

Ammonia, although much less stable than sodium carbonate, has much less action on the glass of the bottles in which its solution is kept. Moreover, it is very largely employed in practice, and the possibility of using it in a standard developer deserves careful consideration. The concentration of even moderately dilute ammonia solution is liable to variation, in consequence of the volatilisation of the gas. A determination of its strength is made either by taking the specific gravity—a tedious operation if done accurately, and of no value if done inaccurately—or by titrating with a standard acid, as in the ordinary process of acidimetry. The latter operation is very simple, and requires very little special apparatus, and no unusual manipulative skill.

Trituration of Ammonia.—We require a burette holding 50 c.c., and graduated in fifths or tenths of a c.c. (or 1,000 grains graduated in half-grains); a pipette with one mark holding 10 c.c. (or 100 grains); a measuring flask with one mark holding 1,000 c.c. (or 10,000 grains); a standard acid; and an *indicator* consisting of a solution of *aurin*, made by dissolving one part of the dye in 500 parts of dilute alcohol.

Oxalic acid is the most convenient acid to employ. The purest oxalic acid obtained from a first-class dealer in fine chemicals* should be used. It has the composition $H_2C_2O_4$, $2H_2O$, and 126 parts are equivalent to 34 parts of real ammonia, NH_3.

Dissolve 37·06 grammes of the pure acid in 1,000 c.c. of water; 1 c.c. of this solution is equivalent to 0.01 gramme of ammonia, NH_3. The solution should be kept in a cool place in the dark.

Dilute strong ammonia with fifteen times its bulk of water; measure off 10 c.c. by means of a pipette, and run it into a beaker or dish, in which you have previously placed about 50 c.c. of water. Add two or three drops of the aurin solution, and then, having previously filled the burette to zero with the acid solution, run the acid very carefully into the ammonia, with constant stirring, until the pink colour is just, and only just, discharged. Now read off the amount of acid which has been run from the burette; the number of cubic centimetres of acid required gives the number of centigrammes of ammonia, NH_3, in the 10 c.c. of dilute ammonia solution taken. Label this solution "Diluted Ammonia, No. 1," and put the strength on the label. From this it is easy to make up an ammonia solution of definite strength. It is desirable to repeat the trituration, and take the mean of the two results. If they do not agree, a third experiment must be made. Before the burette is filled with the acid solution, it should be rinsed out with a small quantity of the solution, which is then thrown away, and the burette is filled. The pipette should likewise be rinsed out with a little of the ammonia solution.

Pyrogallol should be dissolved in distilled water immediately before it is wanted, but the solution will keep well enough for a day or two in a well-closed bottle if it is kept out of contact with ammonia fumes. No acid should be added; there is no evidence that the acid is without decomposing action on the pyrogallol, and it neutralises part of the alkali used as an accelerator.

Sulphites are inadmissible in a standard developer. It is almost impossible to obtain them in a state of purity, and they are subject to continual alteration. Analysis of a large number of samples of commercial sulphites has taught me that even approximate purity and constancy of composition are only to be found in well-crystallised samples of the so-called metasulphites or metabisulphites, which are more properly called anhydrosulphites. Even in these cases the salt was never quite pure, and it altered continuously, though slowly. Variations in the composition of the anhydrosulphites affect the quantity of alkali which they neutralise, and hence, of course, affect the active strength of the developer. We are also, at present, without definite information as to the exact part which a sulphite plays in development, and the influence of different proportions of it.

Consideration of these points led me to the conclusion that a standard developer should contain—

A. Pyrogallol, ammonia, ammonium bromide; or

B. Pyrogallol, sodium carbonate, potassium bromide, or no restrainer.

It is well known that the action of a developer depends upon (1) its concentration; (2) the relative proportion of the constituents; (3) the duration of its action; and (4) the temperature.

A standard developer must be so compounded that it will reduce all silver bromide which has been acted upon by light, without reducing the bromide which the light has not altered, or, in other words, without producing chemical fog.

Messrs. Clark and Ferrero have calculated the relative proportions of the constituents of the more important of the various unnecessarily complicated developing formulæ which have been proposed. Examination of these numbers shows that a developer which contains in each fluid ounce 2 grains of pyrogallol, 1 grain of ammonium bromide, and 3 minims of ammonia solution ·880, may be taken as an approximate average. The use of such a solution as a normal developer has frequently been recommended by Mr. Andrew Pringle. If these quantities are calculated to parts in 1,000, and the proportion of real ammonia, NH_3, is substituted for that of the strong solution, we find that they agree approximately with a developer which contains in 1,000 parts by measure, 5 parts of pyrogallol, 2·5 parts of ammonium bromide, and 2·5 parts of real ammonia.

In accordance with one of the conditions previously laid down, that the standard developer should correspond as closely as possible with the developers used in ordinary practice, I adopted these proportions as a preliminary standard, and made a number of experiments with a view to determine how far this developer was applicable to plates of various kinds, and how far the results were modified by the conditions under which the developer was allowed to act.

Before describing the experiments and their results, it may be as well to point out that the methods in common use for measuring sensitiveness are not particularly accurate. In the Warnerke sensitometer screen, or the Spurge sensitometer, the difference between a sensitiveness of 1 and a sensitiveness of 2 is represented by three numbers or holes; in other words, they do not measure sensitiveness to less than about 33 per cent. of its value. Newall's sensitometer is capable of giving much greater accuracy,

* Becker and Co.; Burgoyne, Burbidges and Co.; or Hopkin and Williams.

but is not in general use. There is, however, no reason why we should not have a standard method of development in readiness for the improved methods of sensitometry which will some day be invented.

(To be continued.)

PHOTOGRAPHY IN MILAN.

A NEW photographic journal has just appeared in Milan. It is called the *Photographic Dilettante*, and is published with illustrations monthly, under the direction of Signor Dott. Luigi Gioppi. The editor, in presenting this journal to the public, speaks of it as an aspirant "desiring to become a direct emanation of the great art of light and shade." Without seeking to diminish in any degree the importance of the already existent photographic publications in Italy, the design of the present journal is, says Signor Gioppi, to provide, at a cheap price, a popular paper with essentially practical ideas for all who are interested in photography.

The title of the journal shows that it is chiefly intended for beginners and amateurs; but it will also have an interest for more advanced students and professionals who are desirous to increase their scientific knowledge or amplify their business gain. The variety and clearness of the illustrations will, it is hoped, says the editor, not only embelish, but assist the comprehension of the matter contained in the printed pages. Special attention will also be paid to all inquirers, in order to establish between this journal and the public a "moral chain of sympathy and affection" in an art which, says the editor, we love above any other.

At present the *Photographic Dilettante* is a "direct emanation" from the celebrated *Annales Photographiques*, an able and successful journal numbering amongst its contributors some of the chief scientific, practical, and amateur votaries of photography. But it is the purpose of the editor to add a large quantity of original matter suited to the tastes and wants of its community of readers.

The present number of the *Photographic Dilettante* for the month of May contains several interesting articles, such as "For Beginners," "An Historic Account of the Art," "Photographic Failures, and Means to Avoid Them," "Apparatus for Enlargements," "Instantaneous Photography," and "Photography with the Magnesium Light."

In "Photography for Beginners" is given an interesting anecdote communicated by Signor E. Beleurgey de Raymond. One of this writer's friends, an excellent musician, used to utter loud and continuous complaints about the rejection of his pictures. Every year several were returned to him with the fatal word *rifiutato*—declined—marked in monumental characters on their backs. His fellow-citizens, in consequence of this decree, were unable to admire his landscapes of a cauliflower green, and his horses of a pronounced jaundice yellow which caused astonishment to his cook. The musician could endure with patience abuse of his music, which was good, but the slightest disesteem of his pictures, which were bad, offended him beyond forgiveness. One day, as he was inflicting on Signor de Raymond his complaints against the obliquity of the judges of his productions, and the general degradation of taste of the people of his time, the latter asked him why he did not busy himself with photography: "With your artistic taste you would certainly obtain most praiseworthy results."

"You think so," replied the musician; "well, it might be, but photography is not art."

"It is at least very near it. Look at these photographs, for instance," and Signor de Raymond produced several views taken from the Valle d'Aosta in a masterly manner. "There," said Signor de Raymond, "is true feeling, and so true art."

"That is so," replied the musician; "but, for my own part, I aspire to something beyond that."

"Several months afterwards," says the narrator of the story, "I met my musician again with his whole being transfigured. He had set himself seriously to the practice of photography, and had already attained a fair *modicum* of success. This success was the death-knell of his pictorial daubs; no more cauliflower greens or jaundice yellows were declined by judges of deteriorated taste in art, and our musician became an amateur photographer of no small repute."

"I narrate this story," says Signor de Raymond, "to show that the learning of photography is neither long nor difficult; and, whilst to become a painter certain natural gifts are requisite, in addition to years of labour, to become a photographer is within the reach of almost everybody."

In the "Historic Account of Photography," M. Rizzardi recalls the observation of the astronomer, Arago, on the 10th August, 1839, that photography was the most marvellous conquest of the human mind; and that of Lamartine, who spoke of it, not as a trade, but a high art and phenomenon in which the artist has the sun for his fellow-worker. According to M. Rizzardi, the "first idea of the camera-obscura was incontestably that of the Neapolitan, Giovanni Battista Porta"—a name since ingeniously converted by some person better acquainted with biblical than Italian history into St. John the Baptist.

In the article entitled "Apparatus for Enlargements," the reader is informed that the ever extended use of papers of gelatino-bromide and chloride has determined the editor to produce a series of articles showing how these may be employed in printing by contact, and how they may be especially utilized for enlargements. "The press of space in our present number," writes the editor, "compels us to defer our first article on this subject to our next number in June; but an illustration accompanies the letter-press of a machine for enlargements, of which a detailed account will be given hereafter."

PROFESSOR MELDOLA'S lecture on "The Invisible Photographic Image" will be delivered at the Royal Institution to-night.

PHOTOGRAPHY AT ETON.—Last Saturday night, Mr. Andrew Pringle delivered an address on "The Pleasures, Advantages, and Various Branches of Photography" to a goodly number of Eton boys, in the new lecture room at the College. The lecture was illustrated with lantern pictures projected upon a specially prepared wall; such white walls for the purpose are now becoming common in scientific and other public establishments, showing the growing popularity and utility of the optical lantern. Mr. Pringle spoke under the auspices of the Volunteer Corps of the College, so he dealt more particularly with military photography, and the biunial lantern employed was skilfully worked by the sergeant of the corps. The speaker stated that he was a Harrow boy, and gloried in the generous rivalry between Harrow and Eton. Mr. Pringle ended by urging the formation of an Eton photographic society. The science master, Mr. Porter, then expressed his willingness to receive the names of intending members, and perhaps the suggestion will bear practical fruit, because about a hundred of the scholars possess cameras. The lecture was of a lively nature, and well received.

THE GLASGOW PHOTOGRAPHIC EXHIBITION.

The Seventh Annual Exhibition of the Glasgow and West of Scotland Amateur Photographic Association, just closed, was held in their own rooms, 207, West Regent Street. To call it an average exhibition would, perhaps, be overstating actual facts, for taking into consideration the membership, the exhibits in no way correspond to the continued growth of the Association. Perhaps it is almost too much to expect that pictures can be obtained annually in sufficient number and of sufficient merit to meet the requirements of an exhibition which is confined to members solely. These remarks are suggested by the conspicuous absence of work from those members who were the prize takers of former years. The works are missing of Snell, Anderson, Rennie, Coulson, Goodwin, and many others. It might be a judicious step to refrain from having an exhibition next year, or, if the members should still desire to continue the yearly show, let some classes be arranged for outsiders, so that additional interest might be imparted and a collection gathered that would attract the general public.

Taking the classes in the order in which they appear in the catalogue, first of all comes that of *Landscapes*. This is divided into two sections: Section A, for pictures whole-plate size and over; and Section B, sizes under whole plate. There are eight competitors in the former section, and David R. Clark, M.A., carried off the honours with his three pictures—"Summer Morning, St. Monance," "The Trysting Tree," and "Pittenweern." In addition, Mr. Clark has secured a medal for the most artistic picture in the exhibition, which has been awarded to "The Trysting Tree." The judges, perhaps, had little difficulty in arriving at their verdict in the case of the picture specified; it would hold its own in a much more strongly competed exhibition than the present. Mr. Charles J. Shaw secures second prize with his "Cottages in Landash, near Rothesay," "Old Pier, Landash;" while the third prize goes to Mr. George Sheriff, for his "Fisherfolk, Pittenweern," "Fishing Boats, Anstruther," "Willows on the Carron;" these have been printed by Blanchard's toning process. In Section B, ex-President Ralph H. Elder has been placed first and third for his "Views in Brittany," while Mr. John Morrison, Jun., is ranked second in order of merit. He has several sets of pictures in the class, all of a high order of merit, and all taken by the hand-camera. The successful three, however, are "Fishers," "Lake of Menteith," "Ploughing, near Kelvingrove Park."

Class 2—that of *Figure Studies*—is, as far as competitors are concerned, decidedly weak, there being only two entries. Mr. Clark scores here again with his "Two a Penny," "The Army of the Future," and "A Funny Story."

Class 3. *Instantaneous.*—As usually to be found in this class, there are one or two pictures which, strictly speaking, do not answer to the term instantaneous. George Sheriff has been awarded first place for "S.S. *Pioneer* leaving Oban," "Before the Wind," "Sound of Mull;" "S.S. *Mountaineer* leaving Oban;" and "The *Thistle*," "The *Ariel*," "The *Cruiser*," and "*Marguerite*" of Mr. T. Steven, Jun., are placed second. Yacht pictures and steamer pictures seem to be more or less played out, and it is somewhat remarkable that a series of hand-camera pictures by Mr. John Morrison, Jun., has not been recognised by those judging as worthy a place. Either of the frames shown by Mr. Morrison was worthy of recognition, the subjects chosen being in no sense hackneyed.

Class 4. *Portraits.*—As necessarily with amateurs, we must not look for a very high standard in this class. Although five entries, only one prize has been awarded, and this goes to Mr. Thomas Taylor, certainly the best shown.

Class 5. *Groups.*—Victor L. Alexander.

Class 6. *Animals.*—It is difficult to say why this class should not be a more strongly competed for class than it is. Mr. James Fleming takes first place with his Dog, Chickens, Pony.

Class 7. *Still Life and Interior.*—David R. Clark is again to the front. He shows three interiors of the Municipal Buildings, Glasgow, all 15 by 12 pictures. Second prize goes to T. Stephen, Jun., for his interiors of St. John's, Malta.

Class 8. *Enlargements.*—Generally one of the strongest classes in an amateur exhibition. The judges have decided to make only one award, and it goes to Mr. Archibald Watson, President, for Marble Staircase, Municipal Buildings, Glasgow; Falcide, Norway; and Corridor, Municipal Buildings, Glasgow. Some of the portraits enlarged would require to be hung very high indeed in order to minimise defects of original negatives.

Class 9. *Transparencies.*—Mr. Archibald Watson, President, is the sole prize taker in this class, there being only himself and Mr. John Morrison, Jun., competing. These exhibitors have made their transparencies on Mawson and Swan's plates, and very creditable productions they are. Lantern plate work being so much in the ascendant at present, it was a matter of astonishment to find this class of picture so poorly represented. Perhaps it would have been a little ridiculous to have given two prizes when only two men had entered the lists, but Mr. Morrison's three pictures have, owing to a lack of interest on the part of his fellow members, been somewhat shelved. They run Mr. Watson very closely, and had more entries been forthcoming, Mr. Morrison would have been pretty sure of second place.

Class 10. *Developed Prints.*—In this class the bromide print is predominant, although one or two specimens of platinotype are to be found. Mr. John Ure Primrose—or, to be more accurate, Councillor Primrose—is here at his best. He takes both first and second prizes. The pictures ranked first are those of "The Staircase, Municipal Buildings, Glasgow," and a "Drawing-room;" while those second include "Coming into Rothesay," "Off Dunoon," "At Hunter's Quay." The picture, "Off Dunoon," is particularly fine. On either side of a river steamer are grouped several yachts evidently becalmed, but most picturesque in their erect bearing with all sails set, the whole forming a most effective and telling piece of composition. About a dozen of frames have been sent in containing pictures which are not for competition, and among them Mr. Clark's exhibit is the most important. The picture entitled "Fisherman and his Wife" gained a medal at the exhibition held some little time ago at Castle Wemyss.

In conclusion, it should be mentioned that the judging was entrusted to Mr. Paton of Greenock, Mr. Allan of Ayr, and Mr. William Young, artist, all of whom have already officiated in a similar capacity at previous exhibitions of the Glasgow amateurs.

Notes.

The proprietor of a Transvaal paper, having offended the Government by an article vigorously attacking its policy, discovered himself in hot water. The authorities swooped down upon the printer, placed an interdict on the paper, and prevented a second edition appearing. The proprietor, however, was equal to the occasion, and had a copy of the first edition photographed. Proofs to the number of eight hundred were printed, and such was the demand for this journalistic curiosity that the *Transvaal Truth* in its photographic form was largely bought up at half a guinea a copy.

The "Automatic Photograph Company," which has, during the past few days, appealed to the public for £100,000 to enable it to start in business, has no doubt a very clever idea to work upon, but the pecuniary success does not appear to be so certain as the prospectus would have one to believe. It is, of course, easy enough to say that 1,000 machines producing half-a-crown a day will yield £45,625, because this is equivalent to two and two making four. What is not so easy to determine is the absolute certainty that 30,000 people daily, or nearly nine millions and a-half yearly, will stand in front of these automatic machines and be photographed. We fully admit that the novelty of the operation will attract the multitude at first, and that in favourable spots, and under favourable circumstances, the machines will be kept going; but that anything like the numbers will patronise them which the promoter of the Company confidently expects remains to be seen.

It may be doubted also whether £15,000—the sum estimated as covering "cost of collection, rentals of machines, depreciation, repairs, and management"—will be anything like an adequate amount. Nothing is said definitely as to the second item. The experience of other automatic machine companies goes o show that the rents charged by railway companies and others form a large proportion of the annual outlay, and we suspect that if £10 per machine per annum were put down as a yearly rent, it would not be under the mark. So far as can be learnt from the prospectus, the apparatus has not had the test which can alone be considered reliable—a lengthened public usage. The machine may be of an extremely hardy nature, and not at all likely to depreciate, or it may require frequent repairs, but on these points evidence is wanting.

What may be termed the photographic side of the prospectus appears to be equally open to criticism. Does it not seem strange that out of the score or so of press notices advertised, not a single photographic paper figures in the list? The inventor has carefully avoided experts, and he may have been prudent in so doing, but as we have not examined the apparatus, we offer no opinion on this point, and simply record the fact. It is comforting to know that "it is not pretended that the invention will materially interfere with high-class photography," but people are likely to have some curiosity as to "the secret of preparing the chemicals." "Hitherto," the prospectus gravely sets forth, "it has been necessary to use expensive materials, which has made it impossible to produce photographs at anything approaching the figure named. It will, therefore, be seen that the revenues of the Company can be largely increased by selling the chemicals for ordinary photographic purposes." Until one has had an opportunity of testing these mysterious "chemicals," the photographic public will not "see" this at all. But no doubt photographers will be glad to be convinced. The omission to mention the exact position of Mr. Ladislas Nievski, the "technical adviser to the Board" (and who is also a director and one of the parties to the contract) with regard to the Stereoscopic Company seems to be slightly misleading. Mr. Nievski is paraded as "chief photographer, London Stereoscopic and Photographic Company, Limited," and this has led the Stereoscopic Company to advertise that their name having been published in the prospectus of the Automatic Photographic Company "in connection with an operator who is no longer in their employ," it is necessary to state that neither directly nor indirectly have they any interest in or connection with the Automatic Company. No one will be surprised at this denial, and so far as the particular point is concerned, it would surely have been more ingenuous on the part of the Automatic Company to have prefixed "chief photographer" by the word "late."

A question as to the patent. The prospectus states "a case has been laid by the Company before Mr. Moulton, Q.C., and Mr. Goodeve, the well-known authorities on patent law, as to the validity of the patent, and they have given as their opinion that the patent is good and valid." No doubt; at the same time, it may be as well to remember that there is another automatic photograph machine in the field. This is the apparatus of M. Enjalbert, which was at work for some time in the Paris Exhibition.

The detective camera may be the forerunner of novel forms of art. We read in a fashion journal that there is a necessity for a new individual—one who might be aptly termed a lightning artist—who could paint with rapidity, and show immediately on large canvasses the very remarkable town-events which are occurring. The detective camera, it is discovered, is expressive and real in its results, but they are diminutive. With the assistance of a few pounds of bright colours, large cartoons might be accurately painted in by a lightning artist. This is all very well, but when the cartoons are painted, what then? Does it mean that a panorama or diorama of scenes in London streets is in contemplation?

CELLULOID AS A DRAWING AND PRINTING MATERIAL.

BY COLONEL J. WATERHOUSE, R.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

I HAVE lately been trying some experiments with celluloid films as a material for drawing and printing upon in connection with photographic processes of reproduction, and a brief account of the results may not be uninteresting. The advantages celluloid possseses as a drawing material are:—

1. Its great translucency, which enables tracings to be very easily made upon it, and also renders it an excellent material for being used as a transparency or transmitted positive or negative for photographic printing. The absence of all grain makes it much better for these purposes than paper or cloth.

2. Its impermeability to and unabsorptiveness of water or moisture, which make it quite free from any tendency to be affected like paper by hygrometric changes, or to be attacked by mildew and damp.

3. The fine matt surface, which takes pencil, chalk, or ink very readily, and can easily be renewed, if necessary, by graining with fine sand or emery powder.

4. The facility with which drawings can be washed off and renewed for purposes of correction or for making new drawings. The surface can easily be kept clean and free from dirt.

I have tried the films as obtained from America, in three thicknesses, the $\frac{5}{1000}$, $\frac{10}{1000}$ and $\frac{30}{1000}$ of an inch The first is about the thickness of thin paper, and is almost free from colour; the second, which seems to be the kind in ordinary use for negatives, &c., is about the thickness of a sheet of stout writing paper, and shows a light buff colour if laid on white paper; the third is about the thickness of an ordinary playing card, and shows a strong buff colour over white paper.

On account of its freedom from colour and great flexibility, which would permit of its being rolled without damage, the thinnest kind would probably be found the most suitable for drawing upon; but as the surface of the thin sample sent me was not so evenly grained as the others, I used the medium kind for the trials. It was found that a soft black lead pencil worked very pleasantly on the matt surface, and gave a fair opacity of line when viewed through the film, so that pencil drawings on this material might be copied in facsimile very easily by various photographic processes. Black chalk also works very well, and gives more opacity in the lines than lead pencil does. The softer kinds work better than the hard. With the latter, as with hard lead pencils, there is a tendency to make lines which polish the surface and render it transparent when viewed through the film.

Indian ink drawings in line can be made with perfect fineness and delicacy, either on the matt or polished films, with pen or brush; but, so far as I have tried, it is not easy to produce shaded or coloured tints in washes; the surface of the material is too unabsorbent, and cut-shades are produced on drying. Stippling or work with the air-brush would probably answer better for shaded drawings in Indian ink or colour.

Our trials have already shown that drawings in pen and ink and in chalk on celluloid can be reproduced very effectively by the photo-etching processes on copper, either by the direct methods, in which asphaltum or bichromated albumen is used as the sensitive surface, or in the manner used for ordinary half-tone heliogravure work with carbon tissue. In the latter case, the drawing must be reversed, unless the film of celluloid is thin enough to allow the drawing to be printed with sufficient sharpness through the film. The drawings would also be suitable for reproduction by certain of the block processes now in use, and blocks could be produced directly from the artists' drawings. For all facsimile work, negatives could easily be obtained, if necessary, by contact printing on dry plates.

The drawings can, in fact, be reproduced by any of the photographic processes now used for reproducing tracings; and as the material is perfectly free from all inequality of grains, is sold in large sheets, and will soon be available in continuous rolls, it seems likely that it might well replace tracing cloth or paper, for all copying or tracing purposes, and especially for tracings to be copied by photography.

The cost of the celluloid sheets in any case is not great, and if not required to be kept, the drawings can be washed off, and the same materials used over and over again. For sketching purposes the celluloid would be very useful, and could be made up into blocks, like paper. It would keep much better than the latter in a damp climate. For drawings for decorative purposes, the material could no doubt be also usefully employed.

For preparing factitious negatives celluloid also offers great advantages and facilities. In this way a drawing in Indian ink or other pigment can at once be turned into a reversed negative suitable for photo-mechanical printing by the collotype processes, or by any of the block processes depending on a direct photographic impression from the negative on a zinc plate, coated with asphaltum or chromated colloid. For this style of work, lamp or ivory black, with a little gum, is the best ink to draw with, Indian ink being rather inclined to become insoluble by keeping. As soon as the drawing is completed, it is evenly coated with a mixture of lamp-black and gold size, as recommended by Major Gore, R.E., or with printing ink and turpentine with a little gold size, so that it may dry quickly. As soon as this is the case, but not before, the film is placed in water, which will at once clear the ink off the lines of the drawing, leaving them quite transparent against the opaque ground. For fine work a little clearing of the lines with a soft sponge may be necessary.

The new films have been tried as a printing surface, in place of stone or zinc plates, and have been found to answer fairly well, excepting that it is very difficult to keep the ground clear and white, and free from a slight dirty tint. Gum and gelatine with various acids and with bichromate of potash have been tried as "etching" preparations, but so far without effect. If with further trial this defect can be overcome, the films might be very valuable as a substitute for stone or zinc in printing. With the delicate cream colour of the stone, which is so much pleasanter for draughtsmen's work than the dark grey colour of the zinc plates, they possess all the lightness, portability, and infrangibility of the latter, without their liability to corrosion. Their ready flexibility would be of value in printing from curved surfaces.

I have not yet had an opportunity of trying the films as a support for the gelatine printing surface in collotype work, but it seems most probable that the thicker kind of celluloid ($\frac{1}{30}$ of an inch thick), would be suitable for this purpose, and would have the great advantage over glass plates of not being liable to break. The transparency of the films would admit of the sunning of the gelatine coat-

ing from the back, in exactly the same way as with glass plates.

The celluloid films can be printed on from stone or zinc fairly well, though the ink takes some time to become thoroughly dry. Printing from copper plates was not found to answer. Type can also be printed from, but the impressions obtained were somewhat weak, and the type indents the films very much; but further trial might give better results. Such prints from type would be useful in a variety of ways, for typing names and titles, &c., on heliogravure plates, and for many other miscellaneous purposes. The impressions from type seem rather too weak to use at once for photographic printing, but they can easily be strengthened by brushing over them some red bronze powder or black lead.

The acquisition of a material like celluloid, obtainable in sheets of large size and fine surface, which is practically transparent, inextensible, and unabsorbent of moisture, nor readily acted on by most acids (acetic acid attacks and dissolves it), is a great advance for all work connected with photography and printing, and it seems probable that we may see a very large extension of its use in these directions before long.

CARBON PRINTING.*

BY E. BRIGHTMAN.

Carbon printing appears to receive less attention from amateurs than any other method of reproduction. The reason why this beautiful process is so neglected is, I think, because an impression prevails that the process is complicated, troublesome, and uncertain. To read a description of the method of working certainly might give one this impression; but the operations are all extremely simple, and with the introduction of the stripping and celluloid films, giving negatives that can be printed from either side, a second transfer is unnecessary: thus the process is greatly simplified.

The advantages of the carbon process are many:—

1. It is undoubtedly permanent.
2. Prints may be made in any desired colour.
3. Absolute uniformity of tone.
4. It can be adapted to all classes of negatives by variation in the strength of the sensitising solution. A thin and feeble negative will give a brilliant and rich print by using a weak bath for sensitising; and a hard, dense negative will yield a soft and delicate print by increasing the strength of the solution.
5. The results obtained by this process are equal, if not superior, to those obtained by any other method.

Against all these advantages we can only set down two drawbacks. The first is that the sensitised tissue will not keep in a ready prepared state for many days; in keeping, a decomposition takes place, which renders the tissue partly or entirely insoluble. Secondly, the action of light on the tissue is invisible, so that examination will not enable us to ascertain the progress of depth of printing; but by means of the actinometer we are enabled to guage accurately the time required to form the image, so that this cannot be considered to be a serious objection.

The carbon process is based upon the property of gelatine, gum, and similar substances, when mixed with bichromate of potassium, of becoming insoluble under the action of light.

Briefly described, the carbon process consists in adding carbon in the form of lampblack, or other finely-divided colouring matter, to a mixture of gelatine, which is evenly spread upon paper. This forms what is technically termed carbon tissue, which is rendered sensitive to light by immersion in a solution of bichromate of potassium. After exposure under a negative, this paper is soaked in warm water; the portion of the gelatine unaffected by light dissolves in the water, while the insoluble portion, or that which has been acted upon by light, together with the imprisoned colouring matter, remains attached to the paper, forming the varied gradations of light and shade in the picture.

To obviate defects experienced by Poitevin and L'Abbé Laborde, Swan introduced his patent process of double transfer.

The gelatine tissue, after exposure, was cemented by means of an india-rubber solution to stout paper. After the rubber cement was thoroughly dry, the print was immersed in hot water, and the paper which formed the original support of the gelatine film was washed away with the soluble gelatine, leaving the reversed picture attached by means of the rubber solution to the second sheet of paper. It is, of course, obvious that this gave a reversed image, requiring a re-reversal, which was effected by sticking the paper face downward to another sheet of paper by means of gelatine. When thoroughly dry, the upper sheet of paper was removed by softening the rubber cement with benzole, leaving the image or picture now properly reversed on a sheet of paper.

This method, though yielding fine results, was troublesome, slow, and costly; and it remained for Johnson, by his more simple method of double transfer, to bring the process to perfection.

* A paper read before the Bristol and West of England Amateur Photographic Association.

Lewes Photographic Society.—This Society has issued the following notices:—June 3rd—Paper on "Twelve Months' Experiences as an Amateur Photographer," by Mr. G. J. Wightman. June 21st—Excursion to Newick. July 1st—Paper on "Composition, Light, and Shade," by Mr. E. J. Bedford. July 19th—Excursion to Buxted. August 5th—Paper on "Printing Processes," by Mr. A. H. C. Corder. August 30th—Excursion to Hayward's Heath for Balcombe. September 2nd—Annual Meeting. September 18th—Excursion to Hailsham.

Aluminium.—According to the *Tribune*, of Rome, Georgia, as quoted by *Invention*, a rather important discovery has recently been made in Floyd County, in the shape, apparently, of a vein of bauxite, or cryolite, suitable for use in making aluminium. The *Tribune* appears to think that the vein contains pure aluminium, but even Georgia could hardly furnish such a wonder, and it will be quite sufficient glory for Floyd County to supply an ore capable of easy conversion into metal. The same journal speaks of a baton of aluminium, with regard to which it makes the following observations: "Lightness is a very desirable quality in a musical director's baton, as well as the metallic brilliancy of surface that shall easily catch and hold the eye of the performer. Aluminium is, therefore, a good material for the purpose, as is soon to be demonstrated. A baton of this metal, recently cast at the Pittsburgh Reduction Company's works, bears the inscription; "Presented to Mr. Richard Teckwer, February 24th, 1890, on the occasion of the XXth Anniversary of the Philadelphia Musical Academy, by the Counterpoint Class of 1890." The baton is 17in. long, and tapers from ¾in to 5-16in. in diameter, and though solid throughout, weighs only 3½ oz. It is beautifully engraved along its whole length, except about two inches in the centre, where the inscription is placed. It has bands of an alloy of gold and aluminium, and the whole surface is finely burnished."

THE CITY PHOTOGRAPHIC EXHIBITION.

A prospectus has just been issued about "The City Summer Photographic Exhibition," to be held under the auspices of the Photographic Trade Section of the London Chamber of Commerce. Among other matters, the circular gives the names of the members of the committee of the Photographic Trades' Section, as follows:—Messrs. Walter S. Bird (*Chairman*), Frank Bishop (*Deputy Chairman*), Thomas R. Dallmeyer, J. J. Elliott, Friese Greene, William Grove, F. W. Hindley, Bulmer Howell, Payne Jennings, H. S. Mendelssohn, J. Lillie Mitchell, L. Warnerke, Waterlow and Sons (Limited), Thomas P. Watson, and S. G. Buchanan Wollaston.

Mr. W. S. Bird states that the members of the committee have no interest in the coming photographic exhibition other than the general welfare of the trade and profession.

The executive committee of the exhibition consists of Messrs. W. S. Bird, *Chairman* (the Autotype Company), T. Watson (W. Watson and Sons), Payne Jennings, Frank Bishop (Messrs. Marion and Co.), and Conrad Beck (R. and J. Beck), and they state that the Photographic Section of the London Chamber of Commerce has received, through the medium of the Chamber, an offer from the Drapers' Company of the use of their Hall in Throgmorton Avenue for the purpose of an exhibition. They add that a photographic exhibition held in the centre of the City under such auspices cannot but be advantageous to the trade. The Banqueting Hall, a palatial apartment, will be reserved exclusively for apparatus, permitting a larger display than has yet been seen in London, while the Drawing Room, Square Room, Court Room, and the Corridor will be devoted to photographs by all processes. A soirée will be held on Friday evening, 30th May, at which the committee state that the presence of the Lord Mayor and many city and parliamentary dignitaries is expected. The exhibition will open on Saturday, May 31st, and close on the 10th of June; hours, 10 to 6; admission free. The Section will have to provide a large number of single and double screens, covered in cloth, giving some 2,000 ft. of space, and so arranged as not to impair the splendour of the apartments. The cost of picture hanging, soirée, advertising, paid assistants, and so on, it is calculated will be covered by a charge to exhibitors of two shillings per square foot, the minimum charge for any exhibit being ten shillings. It is anticipated, however, that the expense may be covered by about one shilling and sixpence per foot, and, if so, a due proportion of the fee paid will be returned to the exhibitor. Should the expenses exceed two shillings per foot, the excess will be met by a guarantee fund already subscribed by members of the Section.

Provision will be made, if possible, to accommodate show cases for apparatus. Sketch and measurements should be promptly forwarded. Applications for space, and for detailed particulars, should be made to Mr. E. Cocking, Photographic Section, London Chamber of Commerce. Mr. Cocking has been appointed secretary, and, by the courtesy of the Chamber, accommodated with office facilities at Botolph House. There will be no medals or awards; the display is not competitive, but to illustrate the best work—optical, mechanical, and artistic—of the photographic trade. There will be no catalogue. Exhibitors will be supplied with two sizes of cards to fill in title or brief description, with name and address, so that visitors can at a glance see the desired particulars. Exhibitors contracting for fifty feet of screen can direct the hanging, and have their names and addresses at the foot of the screen. As far as possible the works of each exhibitor will be kept together. Invitations to the soirée will be sent to each exhibitor and friends.

Mr. Frank Bishop wishes photographers who have not already done so to make their applications for space before all is allotted, and informs us that Messrs. Waterlow have prepared a fine invitation card, five thousand of which will be issued by the Chamber of Commerce to the leading merchants and traders of the city of London, for the opening soirée on the 30th inst.

A MEETING OF OPTICIANS ABOUT LENS MOUNTS.

Last Friday the adjourned meeting of opticians and of some members of the Photographic Convention Committee was held at the Mona Hotel, Covent Garden, London, with Mr. A. Haddon in the chair. Those present were Mr. T. R. Dallmeyer, Mr. William Beck, Mr. Conrad Beck, Mr. W. Taylor, Mr. H. R. Fairbanks, Mr. Rees Curtis, Mr. M. J. Swift, Mr. Hobson, Mr. Turnbull (Wray & Sons), Mr. T. E. Freshwater, Mr. F. A. Bridge, and Mr. J. J. Briginshaw.

The opticians decided unanimously as to the most suitable size of flange and character of threads for lenses of the smallest sizes; a second sized larger flange was then recommended for adoption by a majority, and certain dimensions for standard camera screws were unanimously recommended. What the various dimensions are we are not at liberty to state, because the meeting thought that publication now would be anticipating the report of the Committee. Mr. Dallmeyer stated at the meeting that Mr. Walker, of the Eastman Co., thought that America would adopt the flanges recommended by the Convention, and that he would recommend American firms to do so.

The meeting was adjourned for the consideration of suitable dimensions for flanges of larger size.

THE PHOTOGRAPHY OF THE MORE REFRANGIBLE RAYS.*

BY V. SCHUMANN.

Spectroscopy is fortunately not exclusively dependent upon the employment of glass. Much better service is rendered by a section of quartz. Since the year 1852, in which Stokes discovered the remarkable transparency of this mineral, it has been much more used for spectroscopic researches. Its transparency for the ultra violet rays is indeed astonishing. A few seconds' exposure suffices to take a photograph containing perhaps four times as much as would be obtained with a glass having a similar dispersive power. When the limit of action of such a photograph is ascertained, it is found to be about at the wave-length 2,195; that is, as indicated by the cadmium spectrum, in the neighbourhood of the line No. 25. We have not then, however, reached the limits of the action of light. All the rays which lie on the other side of line 25 work sensibly slower. This is the case with the cadmium line 26, still more for the zinc lines 27, 28, and 29, and to a yet further degree with the 8 further lines of the same element, which required a protracted exposure in order to obtain them.

* Continued from page 361.

If the lenses of the spectrographic apparatus have a long focus (from ¾ to 1 metre) then there does not appear to be a trace of light existing beyond the zinc line No. 29. Unless extraordinary precautions are taken, one may give exposures even of several hours' duration without obtaining any result. When, however, the absorption by the air is taken into account and dealt with, then, with the aid of the aluminium spark, we may succeed in obtaining a range of lines more refrangible than the zinc line No. 29. Of the lines thus obtained, five in number, indications are obtained in the region of No. 30, 31, and 32. In my experience this is the most refrangible ray that had as yet been photographed.

The photography of these lines offers extraordinary difficulties. For years I laboured in vain to obtain the action of them upon my plates, and only in the spring of 1889 were my efforts crowned with any success. I had then at last before me in the photograph the long tried-for lines, but so weak in parts, and of so little intensity, that to insure their visibility required special care. The portion of the spectrum in which they appeared showed with diffused light no trace whatever of a line.

Are the aluminium lines above mentioned the only ones that exist on the other side of the wave length 2024 (zinc line No. 29), or is that region richer than researches up to that time had been able to prove? This question exercised me considerably, since I had made the last five lines of aluminium obedient to the rule of photography. I found myself led, by particular circumstances, to take up again my researches in this direction. A newly fitted up spectrographic apparatus, furnished with all the appliances that my experience of over ten years with the quartz apparatus could suggest—I will return to the arrangement of this instrument later on—yielded me at last, although after many disappointments, an unexpectedly happy result.

Whilst feeling my way photographically step by step along the limited region referred to, I came at last upon a new line. This showed between the pair of lines Al No. 32. Soon after I found a second, and later on a third and a fourth line emerge, and finally these were followed by a widely extended group of lines going far beyond Al No. 32, which, to the eye, appeared to contain considerably over 100 lines. Unfortunately this last-named group is extraordinarily feeble in its action. To photograph it requires an exposure of several hours' duration. Moreover, they only showed with clearness where I had suppressed, as much as possible, all diffused light in the interior of the apparatus. Whether these lines belong to aluminium itself I am not able at present to decide. Since they are so far removed in activity from the other lines, it may be supposed that these are due rather to the air than the electrodes. For me, however, this question came less into consideration. It sufficed me provisionally to ascertain that my source of light gave an almost continous spectrum extending far beyond Al No. 32, and not ceasing till the wave length 1820. Hereby, then, proof was obtained that there are rays which are much more refrangible than Al No. 32.

The unlooked-for happy success with aluminium induced me to carry on researches on the more refrangible rays with a number of other elements. I have now made experiments with many photographs of the spectra of silver, arsenic, gold, bismuth, calcium, cadmium, cobalt, chromium, copper, iron, potassium, magnesium, molybdium, sodium, nitrogen, lead, palladium, platinum, antimony, silicon, tin, tellurium, and tungsten. The wealth of lines of most of these spectra has far exceeded my expectations; at the same time, amongst the new lines are many which possess great power of light, and not a few which are of decidedly shorter wave length than that of Al No. 32. To the more powerful in light of these last-named spectra belong those of bismuth, calcium, and tellurium. The number of lines in many photographs is extraordinarily large. Tungsten, for instance, has sixty, and iron not less. Approaching this are the spectra of platinum, palladium, molybdium, and copper. Some elements give very sharply defined lines. In this particular tellurium stands forth prominently with a very characteristic group of lines close to Al No. 32. Some other photographic spectra, on account of the cloudy character of their lines, leave, for the present, much to be desired. Spectra of this kind require the utmost care if they are not to remain as quite useless for the purpose of obtaining measurements.

Although my photographs show a large number of lines beyond Al No. 32, yet I have never succeeded in obtaining any action beyond the wave length 1820.

It is known that even quartz keeps back a portion of the ultra-violet rays, and according to the paper by Soret on this subject, the most highly refrangible rays are particularly affected. Whether they are completely absorbed, or only in part, is a question which can only be decided by a medium which surpasses quartz in freedom of transmission. Such a medium we possess in fluorite. With the help of a prism and two lenses of fluorite, photographs might be obtained which, on account of the absorption of the quartz apparatus, were not with it practicable.

(*To be continued*).

Patent Intelligence.

Specifications Published.

1,098. *January 21st*, 1890.—"Photographic Apparatus." Communicated from abroad by EMIL KIPPER, 361, Broadway, President of a Company, and ENOCH WOOD PERRY, junr. of 24, Easth 14th Street, Artist, both in the City and State of New York. HENRY HARRIS LAKE, of the firm of Hazeltine, Lake, and Co., Patent Agents, Southampton Buildiugs, London.

This invention relates to that type of photographic apparatus wherein a series of superimposed sensitised plates is successively exposed, and transferred from the camera-box or plate-holder into a suitable receiving chamber or box through the medium of externally operated mechanism.

The objects of this invention are to improve the construction and operation of such apparatus; to provide new and improved means for transferring the exposed plates or films into the plate-receiving chamber; to provide a novel and efficient envelope or carrier for each sensitised plate which will cut off or interrupt the transmission of the chemical or actinic rays of light to the plate or plates in rear thereof; and finally, to generally improve photographic apparatus of the type referred to.

The inventors make twenty-two claims, and their specification is accompanied by drawings.

19,896. *Dec. 10th*, 1889.—"Apparatus for the Manufacture of Photographic Films." A communication from GEORGE EASTMAN, of Rochester, in the County of Monroe, and State of New York, United States of America. ALFRED JULIUS BOULT, 323, High Holborn, London, M.I.M.E.

This invention relates to the production of flexible photographic films from a fluid solution of nitro-cellulose and camphor, and in apparatus therefor; the said apparatus being also capable of use in forming thin, uniform coatings or layers of other materials; and the said invention consists in the novel construction, arrangement, and combination of parts.

The principal elements of the complete machine, apart from the frame work, are a bed-plate having a rigid and substantially level, smooth, and perhaps polished surface; a spreading mechanism adapted and arranged to be moved longitudinally over the bed-plate, and deposit and spread a thin, uniform layer of the fluid coating material; a removable casing for enclosing the surface of the bed-plate, with exhaust apparatus for drawing off and collecting the volatile solvents, and stripping and reeling devices capable of being moved over the bed-plate, for removing therefrom and winding up the dried film or films.

The bed-plate, through preferably constructed of sheets of plate glass, may be constructed of other suitable material having either a polished or dead surface, and is properly supported and levelled, the abutting ends or edges of contiguous sections being accurately fitted to form close joints. The interstices, if any, are filled in level with the surface of the glass by the introduction of a suitable material or composition, such as cement, plaster-of-paris, wax, readily fusible metal, &c., with a view to removing all crevices and depressions into which the fluid solution might enter and thus produce ridges or other irregularities on the surface and in the thickness of the film.

The inventor claims:—

1. In a machine, such as is described, the combination of a bed-plate having a substantially flat surface and a travelling coating apparatus mounted and reciprocating upon guides parallel with the surface of the bed-plate.

2. In a machine, such as described, the combination with the depositing and spreading apparatus mounted upon guides, of a sectional bed-plate composed of sheets of glass, with the interstices between the abutting edges filled with plaster-of-paris or equivalent material level with the surface of the sheets, to form a bed-plate having a continuous surface.

3. In a machine, such as described, the combination to form the bed-plate for the reception of the film, of the frame, the vertically adjustable cross bars, sheets of glass resting upon said beds, and a filling of plastic material between the edges of adjacent sheets to form a continuation of the surface thereof.

4. In a machine, such as described, the combination with the bed-plate of a travelling coating device, provided with a receptacle for the fluid, having a discharge orifice, and a spreading blade supported in rear of said discharge orifice, and extending transversely across, and parallel with, the surface of the bed-plate.

5. In a machine, such as described, the combination of the bed-plate, a travelling hopper, or receptacle for the fluid, having a discharge orifice and spreader, and guides travelling with the hopper, and engaging the surface of the bed-plate to prevent the fluid from spreading laterally.

6. In a machine, such as described, the combination with the bed-plate, of the travelling hopper supported on guides engaging the surface of the bed-plate, said hopper having a discharge orifice, and a spreader in rear thereof.

7. In a machine, such as described, the combination with the bed-plate, and travelling carriage supported upon guides parallel with the bed-plate, of a depositing and spreading device mounted and guided upon the surface of the bed-plate, and connected to the carriage.

8. In a machine, such as described, the combination with the bed-plate, the carriage supported upon guides, and traversing longitudinally of the bed-plate and mechanism for actuating said carriage, of a coating device connected to said carriage, mounted directly upon the surface of the bed-plate; and provided with a receptacle for the reception and discharge of the fluid upon the bed-plate and a spreader blade.

9. In a machine, such as described, the combination with the stationary bed-plate and movable carriage, of the hopper detachably secure to said carriage, and provided with guides engaging the face of the bed-plate, said hopper being provided with a regulated discharge and a spreading blade.

10. In a machine, such as described, the combination with the surface upon which the film is formed, and a receptacle for containing and discharging the solution upon said surface of a flexible spreading blade, and a series of guages interposed between said blade and the surface designed to receive the solution for automatically adjusting the edge of said blade.

11. In a machine, such as described, wherein the fluid is deposited and spread upon a retaining surface, and in combination with the devices for depositing such fluid, and the surface upon which it is deposited, an automatically adjusting spreading blade, the same consisting of a series of independent sections supported upon gauges interposed between the blade sections and the surface upon which the solution is deposited, substantially as described.

12. In combination with the sectional spreader blade, and independent pressure devices applied to the sections thereof, the gauges interposed between the ends of the adjacent blade sections and the surface upon which the film is formed or spread by the blade.

13. In a machine, such as described, and in combination with the bed-plate and a hopper movable longitudinally of, and parallel with, the surface of the bed-plate, and provided with a discharge orifice for the fluid, a sectional spreader blade, supported in rear of the hopper, each blade section being provided with an independent pressure, device, and gauges engaging the surface of the bed-plate.

14. In a machine, such as described, and in combination with the sectional spreader blade supported in rear of the hopper, a pressure spring applied to each blade-section to force it towards the bed-plate, and two gauges interposed between each blade-section and the bed-plate to adjust and sustain said blade-sections with their edges removed from, and substantially parallel with, the surface of the bed-plate.

15. In a machine, such as described, the combination with the bed-plate and sectional blade co-operating therewith to form a film, or layer of the fluid; a series of gauges or supports for the blade-sections resting in contact with the surface of the bed-plate, and provided with converging or bevelled sides.

16. In a machine, such as described, and in combination with the sectional spreader blades, a series of trailing strips pivotally supported at one end, and extending beneath the blade sections, and resting in contact with the surface of the bed-plate, or supporting surface for the film.

17. In a machine, such as described, the combination with the sectional spreader blade and supports, engaging the bed-plate to hold said blade-sections removed from the latter, the bow springs engaging said blade-sections to press them towards the bed-plate.

18. In a machine, such as described, and in combination with a blade-section, a bow spring attached to a bracket at or near its centre, with its ends engaging the blade-section.

19. In a machine, such as described, the combination with the rear and end walls of the hopper, of the pivotted front wall and adjusting devices, such as cams, operating to adjust the discharged orifice.

20. In a machine, such as described, the combination of the bed-plate, the carriage travelling on guides parallel with the bed-plate, the chains or belts on opposite sides of the bed-plate driven in unison and provided with devices engaging the carriage.

21. In a machine, such as described, the combination of the bed-plate, the travelling carriage, the hopper attached to the carriage, and provided with a regulated discharge orifice, and the sectional spreader blade mounted in rear of the hopper, and provided with pressure devices and gauges for sustaining the edge of the blade substantially parallel with the surface of the bed-plate.

22. In a machine, such as described, the combination with the bed-plate, upon the surface of which the film is formed, of a removable casing for covering the film while drying, and an exhaust apparatus in communication with the interior of said casing.

23. In a machine, such as described, the combination with the frame, bed-plate, and the trunk or conduit communicating with an exhaust apparatus or device, of the removable casing provided with an inlet orifice at one end of the plate, and an outlet at the other end opening into the exhaust conduit.

24. In a machine, such as described, and in combination with the bed or plate upon which the film is formed and to which it adheres, a carriage traversing said bed and provided

with one or more cutters for dividing the film into strips while attached to the bed.

25. In a machine, such as described, the combination with the supporting surface to which the film adheres, of a traversing winding reel.

26. In a machine, such as described, the combination of a supporting surface on which the film is formed, a carriage mounted on guides, and traversing longitudinally of said supporting surface, and two or more winding reels mounted upon said carriage in different planes.

27. In a machine, such as described, the combination with the supporting surface, or bed-plate, upon which the film is formed, a travelling carriage, and rollers mounted upon said carriage in different planes, to support the strips, and draw adjacent strips at different angles from the surface.

28. In a machine, such as described, the combination of the bed-plate, the traversing carriage, and two series of winding rollers or reels mounted upon separate shafts on said carriage.

29. In a machine, such as described, the combination of the bed-plate, the traversing carriage, and two shafts mounted upon said carriage and geared together, each of said shafts being provided with a winding roll or reel.

30. In a machine, such as described, the combination with the bed-plate, or surface upon which the film is formed, and separated into strips while adhering thereto, of a travelling carriage, winding rolls or reels, and driving mechanism therefor, mounted upon said carriage, and yielding tension devices, such as springs, intermediate the reels and their driving mechanism.

31. The general combination and arrangement of parts constituting the complete film-spreading device, substantially as described and illustrated.

32. The general combination and arrangement of parts constituting the complete film detaching and winding device, substantially as described and illustrated.

33. The general combination and arrangement of parts constituting the complete machine, substantially as described and illustrated in the drawings accompanying the specification.

7,667. *May 8th*, 1889.—"Obtaining Aluminium or its Alloys." Godfrey Bamberg, 7, Holly Village, Highgate, Gentleman.

My invention relates to the production of aluminium from its chloride, or from the double chloride of aluminium and sodium, by means of zinc. It has heretofore been proposed to bring these bodies together in the solid or liquid form under heating whereby zinc chloride is formed and aluminium set free. Difficulties arise, however, in this process which have prevented its practical adoption. According to my present invention I avoid such difficulties by volatising the zinc in the first instance, and then bringing the zinc vapour together with the vapour of aluminium chloride or of the double chloride of aluminium and sodium at the temperature of a white heat under the exclusion of air, whereby the chemical affinity of the zinc for the chlorine of the chlorides is increased, and both the zinc and the chloride or chlorides are brought into intimate contact in the finest possible state of subdivision, so that a most effective reaction of the particles is established, resulting in the ready production of chloride of zinc, and the setting free of the aluminium, which condenses to metallic form.

I prefer in this process to employ an excess of zinc over and above that required for effecting the said decomposition, so that the liberated aluminium in condensing shall at once mix with the excess of zinc.

The proportions of the materials required for the above described reaction are, theoretically, 195 parts by weight of zinc to 213 parts of chloride of aluminium, but as above stated, I prefer to use an excess of zinc.

The proportion of zinc which combines mechanically with the aluminium is afterwards separated therefrom by subjecting the alloy to a temperature above a clear red heat, or about 1,040° Cent., when the zinc will distil off, while the aluminium, not being volatile at that temperature, is left behind.

The zinc vapour given off can either be directly used again in the process, or it can be condensed into the metallic form.

The zinc chloride can be converted into zinc oxide by the addition of caustic soda, and the zinc oxide can be reduced to zinc by mixing it with fine carbon in any suitable manner and raising it to white heat in the usual way of smelting zinc, and this zinc can be used over again. It will probably be advantageous to use the same zinc over again, as it will contain less impurities than the original zinc, namely, iron, arsenic, silicon, &c.

In practically carrying out my said invention I proceed as follows:—

A suitable retort is nearly filled with zinc previously melted, and of as pure a quality as practicable, and another retort is partially filled with the chloride of aluminium, or the double chloride, or materials such as would produce the vapours of the chloride upon being raised above clear red heat (1,040° C.). These retorts are connected with a third retort, or suitable mixing chamber, by pipes or channels preferably covered with a suitable non-conducting material, so that no sublimation of the chloride, or condensation of the zinc, should take place in them. The mixing chamber is maintained, under exclusion of air, as nearly as possible at a white heat towards that part thereof where the pipes from the retorts enter, while the further end should be at a lower temperature so as to allow the particles of aluminium and zinc to run together therein in the form of a liquid to be drawn off to cool. The zinc chloride will escape at the furthest least heated end as a vapour, and it can then be condensed to a liquid state by means of any of the usual cooling apparatus. The mixed zinc and aluminium is distilled, the zinc going off as a vapour which may be injected directly into the above mixing chamber again, to economise fuel, or it can be cooled down to solid form; the less volatile aluminium remaining behind in fluid metallic form, is run off and solidified.

What I claim is:—

The process for the production of aluminium, or an alloy of aluminium and zinc, from aluminium chloride, or double chloride, wherein metallic zinc and the chloride of aluminium, or double chloride of aluminium and sodium, are respectively heated in separate vessels or chambers to the point of volatilisation, the resulting vapours of zinc and of aluminium chloride, or double chloride, being then brought together in a third highly heated vessel, under exclusion of air, whereby zincic chloride and metallic aluminium will be produced, substantially as herein described.

The Royal Society.—The Royal Society was instituted in December, 1660, and is the oldest society of the kind in the world with the exception of one at Rome. From the period of the Restoration to the reign of Queen Anne, the Royal Society stood alone in this country, in which it has always been the chief scientific organization. Among its former presidents was Sir Isaac Newton, who occupied the chair from 1703 until his death in 1727. Many objects of interest, which once belonged to Newton, were on view in a glass case at the conversazione last Wednesday. Among those present at the conversazione were—Dr. John Evans (treasurer of the Royal Society), Dr. Michael Foster and Lord Rayleigh (secretaries), and Dr. A. Geikie (foreign secretary), the Archbishop of Canterbury, Sir Joseph Hooker, Sir Charles Nicholson, the Swiss Consul-General, Lord Ashbourne, Sir Patrick Colquhoun, the Earl of Rosse, Lord Sudeley, Sir Henry Roscoe, Mr. Justice Wills, Lord Arthur Russell, Sir Edward Reed, Sir D. Salomons, Lord Alfred Churchill, Lord Justice Fry, the Earl of Crawford, the Earl of Mount-Edgcumbe, Sir William Thomson, General Brackenbury, General Strachey, Sir Alfred Lyall, Sir D. Galton, Sir Lowthian Bell, Sir F. Abel, Mr. Wemyss Reid, Mr. A. J. Balfour, Sir Charles Wilson, the Astronomer-Royal, the Master of St. John's, Cambridge, Admiral Sir John Hay, the Bishop of Lichfield, Earl Stanhope, Sir Trevor Lawrence, the Austrian Consul-General, Sir Frederick Pollock, the Bishop of St. Asaph, Sir Frederic Leighton, the Provost of Oriel, the Master of Christ's, and Sir F. Bramwell. The members and visitors were received by the President of the Royal Society, Sir G. G. Stokes, Bart., more familiarly publicly known under the time-honoured name of Professor Stokes, whose discoveries in relation to fluorescence are so well known among photographers.

Correspondence.

DEVELOPMENT IN TWO SOLUTIONS.

Sir,—In reply to the letter of your correspondent "X." which appears in the last number but one of the News, I regret that there should be any difficulty in understanding the paragraph in my article in the Year-Book to which he refers. The words in italics which I now insert may perhaps help to express my meaning more clearly. "The second developer or intensifier need only consist of a similar solution *(to the first)*, with the full dose of pyro *(and alkali in proportion)*, and the addition of a soluble bromide." The quantity of pyro would be the same as recommended for the ammonia formula—viz., 8 grains to the ounce of developer, not 16 grains (as "X." puts it), which is the quantity contained in the No. 1 solution, the latter being mixed for use with an equal bulk of No. 2, which contains no pyro. The amount of bromide necessary would vary according to the alkali used; soda requires less than potash, while some samples of the latter require more than others. In either case, very much less bromide is needed than with ammonia; probably 3 to 4 grains potassium bromide to the ounce of developer will give all the restraining power necessary.

With regard to "Beach's developer," I confess I do not understand the formula as given by your correspondent, nor do I see how it can be utilized as it stands, inasmuch as the various ingredients are not soluble in anything like the proportions given; also the method recommended for using the compound is diametrically opposed to the principle I have advocated of obtaining detail first and density afterwards.

B. J. Edwards.

The Grove, Hackney, London, N.E.

PHOTOGRAPHIC EXHIBITIONS.

Sir,—It is interesting to find by your extract from the *Journal of the Photographic Society of India* that the subject of reform in the conduct of photographic exhibitions has travelled as far as Calcutta, and that our Indian brothers are already beginning to discuss the question whether present regulations are the best possible. In the course of his remarks the writer tells us that in the late Calcutta Exhibition, out of nineteen professionals exhibiting, only five were undecorated by the judges. This clearly shows that the medal craze is as bad abroad as at home. The question arises, is it possible or desirable, now that the use of medals has been so degraded, that they should be abolished altogether? If it were possible in art to decide what is absolutely good, better, or best, and any definite standard of excellence could be fixed, then some reasonable arrangements might be made for awarding to the best photographs in the show some honourable distinction. But it is quite impossible. There *is* no absolute standard of excellence in art. The best to one school—a very masterpiece—to another school may be an abomination, and so everything depends on the judges, generally honest, but seldom competent to appreciate the subtle beauties of a truly artistic production. They are thus often overpowered by the aggressiveness of size, subject, or quantity, and frequently pass over the finest work from its refined unobtrusiveness.

The exhibition promoters appear afraid to abolish medals, fearing that so doing would take away all inducement to exhibit. Well, perhaps it would act in this way to a great extent if nothing were put in their place, but it seems to me there is a satisfactory way out of the difficulty. First let me ask, why do photographers exhibit? For fame, for advertising, or to sell their exhibits, or for a combination of all these, and the *raison d'être* of an exhibition we may assume to be educational, or to demonstrate the best possibilities of the art. Now if societies holding exhibitions would start on a scale according to their means, a sort of Social Photographic National Galleries, a collection of the best work sent to their shows, they would meet the best interests of all concerned, and attain the objects of exhibitors and promoters alike, beside performing valuable historical work, preserving many beautiful productions which would otherwise in all probability drop away in a short time into obscurity. Ralph W. Robinson.

Proceedings of Societies.

Photographic Society of Great Britain.

The ordinary meeting of this Society was held on Tuesday last, the 13th inst., the President, Mr. James Glaisher, F.R.S., in the chair.

A paper by Mr. T. R. Dallmeyer on "Reflected Images in Optical Combinations, and their Effect on the Brilliancy of the Image," was read, accompanied by diagrams on the black board. In the course of the paper Mr. Dallmeyer referred to the first demonstration on the subject by his father, which had been made in conjunction with Sir John Herschel, and given to the Society in the year 1867. The subject of the flare spot was then particularly gone into, but there were other considerations which might advantageously be dealt with. Flare spot was due to the formation of the diaphragm, and could in most lenses be modified or dispersed by changing the position of the diaphragm. For the causes of want of brilliancy now to be discussed the following deductions would apply. 1. The fewer the number of reflecting surfaces, the greater the brillancy of the image. 2. The fewer of these surfaces that were concave to the plate, the greater was the brilliancy of the image. 3. The fewer of these surfaces that were behind the diaphragm, the greater the brilliancy. Flare spots and what were called ghosts had been dealt with, but a point which he believed had not been previously treated was the reflection of light by the plate itself on to the lens, and the consequent reflection back from the lens on to the plate of some of this light. A camera was shown on which, in place of lens, was a front pierced with a pattern of holes at one corner. The back of the camera was fitted in the place of the plate with a concave reflector having the same focus as the distance from the front, and images of the holes were then seen to be thrown on to the corner of the inside of the camera front opposite to that at which the holes existed. Included in the drawings on the black board were representations of the following lenses—a rapid rectilinear, a Petzval portrait lens, a Dallmeyer portrait lens, and a Dallmeyer single rapid rectilinear lens. The latter was introduced particularly because there had been a controversy between Mr. W. K. Burton, of Japan, and himself about it in the pages of the Photographic News. Mr. Burton had, however, since then, in a communication to a photographic newspaper, admitted him (Mr. Dallmeyer) to be in the right. When with this lens it was desired to obtain particularly brilliancy, and other considerations were of less importance, it would be better to use the stop behind the lens.

Capt. Abney congratulated Mr. Dallmeyer upon bringing forward a new phase of the question. One cause of want of brilliancy that had not been touched on was the fact that glass was not perfectly transparent, but acted as a source of light to the extent, indeed, of 4 per cent.

Mr. W. England thought that more care ought to be taken to shield the front of the camera from light. In his practice he never went out to photograph without a hood attached to the camera, and he thought camera makers generally ought to furnish their cameras with such an appliance.

Mr. L. Warnerke was of Mr. England's opinion, that hoods should be furnished with cameras.

Mr. V. Blanchard thought that the credit of using a hood to shade the lens was due to Mr. England, and that he had suggested it to the late Mr. J. H. Dallmeyer.

Mr. W. E. Debenham remembered seeing and using a sliding box hood, called a front camera, as long ago as 1857. It could be drawn forward so as to exclude light from the lens, except that coming from the picture to be represented. Such an arrangement was far more effective than a small hood attached to the lens itself.

Mr. T. Samuels had noticed, when photographing with Johnson's pantascopic camera many years since, that the image was more brilliant than that which he could obtain in other cameras, and found that this brilliancy was due to the fact that the camera was supplied with a front or hood to keep stray light from the lens.

Dr. G. Lindsay Johnson thought a shade for the lens very

important. He used simply a tube which just fitted freely enough on to the lens jacket to enable it to be drawn forward, as much as might be desired, for the purpose of shading the lens. He did not see the advantage over this plan of having a large hood. He would like to be informed whether the superior brilliancy noticed in photographs taken with a single lens was not due to the fact that the tube of such a lens acted itself as a hood.

Captain ABNEY could not see the advantage or difference in principle of a large hood attached to the camera over a small one attached to the lens. In illustration of his remarks, he drew a diagram upon the black board showing the sun and a lens, and, drawing a line from the one to the other, said that it did not matter where the hood was placed so long as it cut that line.

Mr. DEBENHAM thought that Captain Abney would admit that the last proposition would be correct only in the case of a lens of infinitely small magnitude, or of a pinhole photographic apparatus. Where the hood was small and close to the lens, if the bottom of the lens were to be shielded from the sun, the hood might have to be drawn down so low that the upper part of the picture which it was desired to include would only fall upon the lower portion of the lens, and so either act only with a reduced amount of light, or be altogether cut off, if, as is the case with doublets, the stop is behind the front lens.

Mr. DALLMEYER said that he agreed with Captain Abney that it did not matter where the hood was placed, and disagreed with Mr. Debenham in the matter. An optician was required to place a hood where light from any required angle, say, from where the sun was, should not pass through the diaphragm of the lens. He drew on the black board a cone extending from the front of a doublet lens, and represented a hood first, close to the lens, and then at some distance from it, and said that it was of no importance at what part of that cone the hood was placed. With regard to the desirability of allowing some reflection, he added that it gave what was called the effect of atmosphere, but whatever there might be in its favour from an artistic point of view, from a scientific point of view any loss of brilliancy should be avoided.

Mr. WARNERKE showed some strips of gelatine film such as is used for emulsion. These strips had darkened at the edges, and he thought this circumstance might help to explain the fogging of the edges of gelatine emulsion plates which was so often found to occur when they were kept for any length of time.

Dr. LINDSAY JOHNSON showed a photograph which he characterised in no very flattering terms, but which was an object of curiosity as having been taken by an automatic photographic apparatus, of which the members had doubtless heard. It was of the ferrotype kind, and measured about two inches in length.

Mr. DEBENHAM said that according to the prospectus of the company formed to introduce this machine, the chemicals used were cheaper than those at present employed in photography, and as it was proposed as part of the business to supply such chemicals to photographers, they might be led to hope for some reduction of expense from this cause. On the other hand, as it was stated the chemicals and materials for the photograph had been contracted for at the rate of a half-penny each, and as the cost of either collodion and bath, or of gelatine emulsion, for such a plate, would probably not exceed the twentieth of a penny, there might be some mistake as to the cheapness of the chemicals. The cost of ferrotype plate itself he did not know, but did not suppose that it could amount to the difference.

Mr. J. W. BEAUFORT was elected a member.

THE CAMERA CLUB.

ON Thursday, May 8th, a special lantern slide exhibition took place at the Camera Club, and photographs taken during recent tours in Egypt were shown by Messrs. Rodgers, A. Collins, and Major Nott.

Amongst the transparencies were some of excellent quality, and the collection contained a variety of interesting illustrations of present life and manners in Egypt, with original views of the pyramids and other remains and public buildings. Mr. Elder exhibited a number of photographs recently taken in Madeira and Teneriffe ; Mr. Andreae some interesting views of volcanoes in action and other subjects ; Mr. Ferrero some landscapes taken on club excursions ; and Mr. Crookes some charming pictures of Ighthan Moat-house. Other slides by Messrs. Fitz Payne, Carnell, and Sands were exhibited.

On Thursday, May 22nd, Mr. Shipton will read a paper on "Cyclo-Photography—some recent developments, including an ideal bicycle."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on Thursday, May 8th, Mr. J. S. TEAPE in the chair.

The HON. SEC. announced, as a result of the committee meeting held last week, that it had been arranged to have an outing once a month on the second Saturday in the month ; also that papers and demonstrations had been promised by Messrs. J. Traill Taylor, W. E. Debenham, and A. Haddon.

Messrs. H. M. Smith, A. Haddon, and T. E. Freshwater were elected delegates to represent the Association at the forthcoming meeting of the Photographic Convention at Chester.

Mr. H. M. HASTINGS passed round some prints on the new Parisian paper, prepared with chloride of iridium. He said it printed in about half the time of silver, toned very quickly, but lost considerably in the fixing. The general opinion was that, judging by the directions enclosed with the paper, and the results shown, the proportion of iridium used was exceedingly small, and that the process bore a strong family likeness to silver prints on plain paper.

Mr. HASTINGS also exhibited a series of twelve quarter-plate negatives developed with various developers—from eikonogen to pyro and ammonia. They had all received the same exposure, and were all developed for seven minutes. He considered the best result obtained with the No. 1. eikonogen developer, as prepared in the directions issued by Messrs. Marion and Co.

A circular letter was read from the Photographic Convention of the United Kingdom, asking that delegates might be sent from the Association to the Chester meeting.

Mr. P. EVERETT moved that "the circular be placed under the table, and that delegates be not sent ;" there was no seconder, and Mr. Everett withdrew the motion.

THE HACKNEY PHOTOGRAPHIC SOCIETY.

THIS Society held its annual meeting, on May 8th, at Morley Hall, under the presidency of Dr. ROLAND SMITH.

The Society has just terminated the first year of its existence, and has a roll of nearly 100 members, included in which are several well-known amateurs, prize takers at various exhibitions.

The following were elected officers for ensuing twelve months :—*President*, Dr. Gerard Smith ; *Vice-Presidents*, Dr. Ambrose Kibbler, Dr. Rolaud Smith, and Mr. J. Hubert ; *Treasurer*, Frank Jolly ; *Curator*, A. Dean ; *Secretary*, Mr. Fenton Jones, 12, King Edward's Road, N.E. ; *Council*, Messrs. H. Burton, W. L. Barker, H. J. Beasley, J. O. Grant, F. Houghton, Dr White.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

May 8th.—Alderman J. B. STONE, J.P., in the chair. Eight new members were elected.

The curator of the Municipal Art Gallery (Mr. Whitworth Wallis) sent a communication acknowledging the receipt of the National Challenge Cup (won by the Birmingham Society at the Crystal Palace Exhibition in March last), and asking for examples of the pictures which won the cup to be exhibited with it in the Art Gallery.

At the close of the ordinary business Mr. STONE announced that the present meeting had been called specially to discuss the proposed photographic survey of Warwickshire. In the course of his remarks, he said :—"There are two distinct ways in which you can deal with the matter ; one is by taking it in hand yourselves and deciding to work out the whole problem, taking credit for the result of your labours, keeping the con-

trol of the whole undertaking, and carrying it out within your own limits. If you take this view it will be your duty to set about a scheme within your own means and within your own numbers. If you take a good lead, you will be followed by others, and if you take a narrow view, and you permit jealousies to exist amongst yourselves, or in respect to other people, you will damage the whole thing. If you can decide upon broader lines, which I recommend, you will at once offer to the whole world a good idea, and appeal to the co-operation of every one interested in it to contribute towards its success. For this you must go outside your own Society. It appears to me if you do (and I hope you will) you will obtain considerable support—pecuniary and otherwise—from the county generally. You must present to the public a broader scheme, that will invite confidence and that will attract support. You cannot propose any kind of council or committee limited to yourselves; you must begin by proposing a representative council for the photographic survey, and must state frankly that you are prepared to send representative members and render every assistance. There would be, of course, elected representatives from other districts and other societies, and I suggest, also, co-optative members useful to you in many ways, and men sufficiently known to ensure the confidence of the city of Birmingham and the county generally. Then, depend upon it, your prospect will succeed, and you may almost believe that your scheme is an accomplished fact."

Mr. Jerome Harrison, F.G.S. (Vice-President) said that their President advocated the establishment of a County Council or Committee, by which the photographic survey of Warwickshire should be directed; and, considering that there were several photographic, as well as many scientific, artistic, and literary societies in the county, he agreed that such a guiding body was desirable. Such a council should consist of representatives of all the societies willing to promote the work of the photographic survey. But he (Mr. Harrison) did not think it was necessary that their own Birmingham Society should sink their own identity with the task which they had resolved to undertake. The Council of the Birmingham Photographic Society had been carefully considering the question, and they had unanimously passed the following resolution:—"That it is desirable to form a photographic survey section of the Birmingham Photographic Society, with separate officers and separate subscription, to commence and carry out a photographic survey of Warwickshire." He trusted that the meeting would endorse that resolution. The section could then invite the co-operation of other workers in the county and form the "County Council" to which Mr. Stone had alluded, by which the work done by each Society should be pointed out. As there would necessarily be certain expenses incurred, it would be needful to charge a small extra subscription to the section. He hoped they would also invite gentlemen to join the survey section who, although not photographers, felt an interest in the work; and for them the subscription should be somewhat higher. Such persons could thus join the survey and assist in its work without becoming members of the Photographic Society.

The resolution was carried unanimously.

It was then resolved, "That the subscription to the Photographic Survey Section shall be half-a-crown per annum for members of the Birmingham Photographic Society, and half-a-guinea per annum for all others."

Thirty-eight gentlemen then gave in their names as members of the new section.

The officers of the section were elected as follows:—

Chairman—Mr. J. B. Stone. *Vice-Chairman*—Mr. Jethro A. Cossius. *Curator*—Mr. B. Karleese. *Treasurer*—Mr. S. G. Mason. *Hon. Secretaries*—Messrs. J. H. Pickard and W. J. Harrison.

The question of a governing body to direct the general work of the survey was next considered. The following resolutions were then passed:—1. "That the Council should consist of representatives elected by the various photographic and scientific societies of Warwickshire, with co-optative members who may be of service in developing or aiding the work of the survey." 2. "That the photographic, artistic, and literary societies of Warwickshire be invited to send representatives to a general meeting on May 22nd, at St. Edmund's College, Edmund Street, Birmingham, for the purpose of electing a council to direct the photographic survey of Warwickshire."

Sheffield Photographic Society.

The monthly meeting was held at the Masonic Hall on Tuesday evening, when, after the routine business of the meeting, and the election of Mr. W. V. Davy as a new member, Mr. J. W. Charlesworth gave a paper on "Hand Camera Work." He began by describing one made by himself, and showed the most minute details of the same. There were also laid on the table hand cameras by Swinden and Earp, the Griffith's guinea camera, the quarter-plate Kodak and the original Kodak, two by T. G. Hibbert, viz., Turnbull and Rouch's; also the Demon, a toy.

It was announced that Mr. Chadwick, of Manchester, had promised to give a paper at an early date; also that the Britannia Company, Ilford, would give a demonstration, "How to Work Alpha Paper," at the September meeting. A copy of Dr. Emerson's book "Pictures in East Anglia," given by the author to the library, was produced, and arrangements were made for the loan of the same amongst the members.

Photographic Society of Ireland.

An ordinary meeting was held on May 9th, when the President Mr. George Mansfield, J.P., occupied the chair, and Mr. L. R. Strangways, M.A., read a paper on "Stereoscopic Work." The subject was a resumé of the past, an insight into the present, and a prophecy of the future of the stereoscope as it relates to photography.

There was a discussion which brought forth experiences of some of the older members of the Society. Mr. Strangways exhibited a number of cameras which he owned, as well as some which he obtained from the trade, to illustrate the various points he put forth.

At the conclusion of the paper and discussion Mr. Hedley exhibited a hand camera made by Messrs. Swindon and Earp, of Liverpool, which has a capacity for carrying twenty plates in the smallest space, and possesses many well-thought-out devices.

The first excursion of the season took place on May 10th to the Dargles. The morning was wet and the day very dull, which resulted in a small attendance of members.

The session is to close for indoor meetings by an exhibition of members' work in lantern slides on the 22nd inst. This meeting is to take place in the large theatre of the Royal College of Science instead of the Society's rooms.

The West Surrey Amateur Photographic Society.

On Wednesday, May 7th, Mr. Davison gave an address on "Platinotype Printing Processes," accompanied by a demonstration. Mr. Winsford occupied the chair. Several new members were nominated.

Mr. Davison, having recited the advantages of the processes, and given briefly the theory of the formation of the platinum image, explained the distinction between the hot bath, cold bath, and printing-out methods respectively, and proceeded to develop a large number of proofs showing the ordinary details of practice as well as the variations in colour obtainable by the use of the sepia papers, and by the addition of mercuric chloride (half dram to one dram per ounce of hot oxalate solution) to the developer. Cold bath prints were also developed; specimens of all the variations were handed round upon glass plates, as also mounted examples of platinum prints on fabrics and rough papers.

It was decided that the next out-door meeting of the Society should be to Carshalton and district, and that the subject for the first Wednesday in May, evening meeting, be "Gelatino-Chloride Emulsion Papers." Mr. Jaues is to treat this subject.

The Lewes Photographic Society.

A paper on "Cloud Photography" was read by Mr J. J. Hollway at the usual monthly meeting of the Lewes Photographic

Society, held on Tuesday evening. The chair was occupied by the president, Mr. J. G. Braden. A vote of thanks was passed to Dr. P. H. Emerson for the gift to the society of a copy of his work on "East Auglian Life."

Mr. J. J. HOLLWAY read his paper, and described the many beauties of cloud form and sky effects, illustrated by examples from the works of Constable and Gainsborough, showing the proper relation cloud forms should bear to the other part of the pictures. While recommending photographers to use cloud negatives to complete their pictures—for he considered nothing so offensive to the artistic eye as the broad patch of white for the sky generally seen in photographs—he cautioned them about using them iu an inartistic manner, as it was quite probable that unless clouds were inserted with taste and after careful cousideration of their appropriateness to the general effect of light and shade and general composition of the picture, they would rather detract froin what beauty might have existed before their introduction, thau bring about the desired improvemeut. Mr. Hollway exhibited specimens of his own cloud photographs, and by this means showed how greatly the general effect of a photograph could be improved by the judicious introduction of clouds.

At this meeting it was arranged to meet the Hastings Photographic Society on Wednesday, June 4th.

THE PHOTOGRAPHIC CLUB.—The subject for discussion on May 21 will be "Photo-Mechanical Processes"; May 28, "Photographic Fog."

COLOURING MATTER FROM CHLOROPHYLL.—A. Hausen (*Bot. Centralbl.*38, 632) prepares the yellow aud the green constituents of chlorophyll in what he believes to be a pure conditiou by the following process: Some leaves of grass are boiled in water from fifteen to thirty minutes, then washed many times with water, and dried iu the dark. The dry matter is extracted with boiling alcohol, and the solution saponified by boiling for three hours with a slight excess of aqueous soda; a current of carbonic anhydride is then passed through the solution, which is afterwards evaporated to dryness on the water-bath. Ether extracts from this soap the yellow colouring matter only, which is purified by evaporatiug down and crystallizing from a mixture of equal parts of ether and light petroleum. The soap, after extraction with ether, is extracted with a mixture of alcohol and ether, which dissolves only traces of the combination of the green colouring matter with soda. On adding another quantity of alcohol-ether and also phosphoric acid, the green matter is liberated and passes at once into solution, from which it is obtained by evaporation in the form of a brilliant, fragile, greenish-black solid, insoluble in water, benzene, and carbon bisulphide, sparingly soluble in pure ether, very soluble in alcohol with strong red fluorescence. The crystals of yellow colouring matter form orange-red plates insoluble in water, soluble in alcohol, ether, chloroform, and benzene to a deep yellow colour, and in carbon bisulphide to a brick red. These crystals are transformed in the light into cholesterin. The author considers this yellow substance to be identical with the yellow colouring matter of flowers and fruits in general, including that of the carrot.—*J. Chem. Soc.*

RECEIVED:—From Mr. J. R. Gotz, a bottle of special concentrated toning solution for a new Obernetter matt surfaced gelatiuo-chloride paper. The specimen prints accompanying this were free from objectionable gloss, yet contained plenty of detail. The sulphocyanide toning solution we tried upon Alpha paper which happened to be handy, and found it to give rich blacks exceedingly quickly, so that it had to be diluted more than recommended by the veudor.——Fallowfield's well-known *Photographic Annual* for 1890 has also been received. It is now a goodly volume of 432 pages, and contains a considerable quantity of literary matter, giving useful practical iuformation, in addition to the trade particulars relating to photographic applianees. Mr. Fallowfield also sends one of the sheaths which he now fits to his "Facile" hand-camera, to overcome the difficulty of the varying thicknesses of dry plates. Some notices of books and some patent intelligence we are again obliged to postpone because of press of other matter.

Answers to Correspondents.

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

S. B.—*Mergel's Mercury Process.* The details of this process were never made perfectly clear, but you will find an account in the jouruals of April 1872. Paper was treated with ammonio-nitrate of silver, or with a gold salt, then the negative, exposed to mercury vapour, was laid down upon it, and there left, so that the mercurial fumes escaping therefrom should effect the reduction of the silver (or gold) salt, forming an amalgam on the principle of the *Arbor Dianae.* The image so produced in the paper was toned and fixed in the ordinary way, and was said to be permauent.

M. E. P.—*Gum Elemi in Photo-Lithographic Ink.* We find some particulars in the *Photo. Correspondz* relating to the employment of gum elemi in the somewhat complex mixture which is used for ink, both on stone and zinc, for the photo-mechanical processes. It is combined with suet, beeswax, asphalt, resin, and turpentiue, linseed oil varnish and lamp-black constituting, indeed, the chief ingredieut in the ink specified in a long formula therein given.

AMATEUR (Sandgate).—*New American Printing-Out Process.* Give it a trial by all ueans, and compare with your ordinary method for rapidity. No chloride is used, but equal parts of ferric oxalate, silver nitrate, and gelatine dissolved together in warm water with a sunall quantity of tartaric acid.

T. L.—*Photography in Natural Colours.* Since you wrote last week, the letters of Dr. Eder, Dr. Gunther, and M. Leon Vidal, have all appeared in the NEWS, and give as much information as seems likely to be forthcoming; but from these you will be able to glean further details.

ASSAYER (Llanelly).—*Chlorine in Hydrochloric Acid.* The best way of testing for free chlorine is to dissolve a small quantity of diphenylamine in the suspected hydrochloric acid, and look for a blue colouration. Or, the dipheuylamine may be dissolved in alcohol, and poured gently upon the surface of the acid, when the production of a blue halo at the line of junction makes itself apparent.

TECHNIC.—*The Britannia Works Premium.* It is very easy to criticise, but if prepared with a formulated scheme, the way is still open for you to submit a proposal, together with the names of those who agree to assist you in giving effect to your plans.

F. H.—*Zinc Alloys.* Unless you put in some tin, it is not possible to make zinc alloy with lead.

GOTHIC ART.—*Albert Dürer.* The current number of the *English Illustrated Magazine* devotes twenty-one pages to a notice of his works, by Albert Fleming, with some very fine engravings.

C. H. (Walsall).— Dr. W. J. Nicol's patent for "Improvements in and connectiou with Photographic Printing," is dated March 29th, 1889, No. 5,374.

F. C. S.— *New Gaseous Element.* Yes, if confirmed, the uew element damarium will quite revolutionise the present system of chemical formula according to the ruling atouic theory. Hydrogen, being no longer the lightest known element, cannot be taken as unity, but will have to give place to Damarium (D) at the bottom of our atouic series, and all the former weights will have to be doubled. Thus, hydrogen becomes 2, chloriue 71, oxygen 32, sulphur 64, &c. It is said to be the most powerful reducing agent known, instautly throwing out gold, silver, eopper, and lead from their metallic solutions, and reducing sulphurous acid to free sulphur, with production of the new oxide, D_4O. Truly this will necessite great changes, but we must wait for confirmation of this astounding discovery.

COL. WATERHOUSE.—Your interesting communication received and forwarded. Your experimeuts certainly indieate quite an original departure.

RECEIVED:—Report of the Newcastle-upon-Tyne Meeting of British Association, and Prospectus of the Automatie Photograph Company, Limited.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

A DAMP PROCESS.

Much is said now-a-days about the ease of the gelatino-bromide and other dry plate processes for landscape photographic work, as compared with the wet plate method of early times, with its developing tent or box, and the other heavy encumbrances it was necessary to take into the field. Perhaps the newly fledged race of photographers may be unaware that so far back as 1863 an excellent "damp" process was in use, cheaper than the present dry-plate process, whereby plates which would keep good for a day could be taken into the field just as dry plates are carried, and be brought home for development the same evening. Some practical advantages might perhaps be gained by experimentally examining the artistic and other merits of some of the best processes of the past, especially as it is well known that wet-plate methods tend to favour high quality in certain photomechanical and orthochromatic results.

The glycerine process was devised by Mr. Fysh, one of Mr. Valentine Blanchard's friends, and Mr. Blanchard published it in the YEAR-BOOK for 1863. A plate is coated with bromo-iodised collodion, then immersed in a thirty-grain nitrate of silver bath made faintly acid with acetic acid, for it is said that in this process no trace of nitric acid must be present in the solutions. The next step in the treatment is made by the use of the following solution:—Take of English honey, old and crystallized, four ounces; Price's glycerine, two ounces; nitrate of silver, thirty-grain bath, new and iodised, six ounces. When thoroughly mixed, add kaolin half an ounce and shake well, and repeat the shaking occasionally for an hour; then place the mixture in a light place, but not in sunshine, for two days. The solution above the kaolin deposit improves by keeping, and when required for use some of it is filtered into a measuring-glass for the purpose. When the plate is taken from the sensitising bath some of the glycerine mixture is poured over it, and kept moving until all oily appearances cease. The plate is then drained into the bottle, and some more of the glycerine mixture is poured over it; again the surplus is poured from the plate into the stock bottle, after which the plate is placed on edge on blotting paper to drain; when sufficiently drained it is placed in the dark slide for use. Mr. Blanchard's experience was that these plates would keep in good condition four hours in summer, and a day in winter. We used the process extensively, and about 1865 published in contemporary photographic literature some experiments made with it. By reducing the proportion of nitrate of silver in the glycerine solution, it was found that the plates could be made to keep good for a day in summer. The old protosulphate of iron developer was used to bring out the image.

The glycerine and honey mixture recommended above seems highly empirical from a scientific point of view, and no doubt the solution will bear simplification, but in general it yielded excellent results in the hands of those who gave it a trial. Mr. Carey Lea tried it on our recommendation, as mentioned in his book on photography, and spoke favourably of his experiences therewith. Those who found it a failure perhaps used impure materials, for honey is one of the most easily adulterated articles known, as the Swiss—who produce it in large quantities—are aware; then again, some samples of glycerine contain lead, and even high-class varieties sometimes contain chloride of sodium, and will not stand the nitrate of silver test. Not a bad method of applying the glycerine "preservative" is by means of a dipping bath. To those who understand the precautions necessary in working the wet-plate process successfully, the glycerine process for outdoor work within a moderate distance of home is easy, rapid, and inexpensive.

A MEETING OF OPTICIANS ABOUT LENS MOUNTS.

Perhaps the most influential meeting of photographic opticians ever held was that which took place last Wednesday night at the Mona Hotel, London, to make recommendations to the committee of the Photographic Convention about standard mounts for lenses. Mr. A. Haddon presided. Those present were Mr. T. R. Dallmeyer, Dr. James Edmunds, Mr. John Stuart (Ross and Co.), Mr. H. G. Heyburn (Ross and Co.), Mr. L. Cohen, Mr. A. Staley (Charles Reynolds and Co.), Mr. H. J. Anderson (Messrs. H. Anderson and Son), Mr. M. J. Swift, Mr. E. Clifton (the Stereoscopic Company), Mr. W. Taylor, Mr. Conrad Beck, Mr. H. Crouch, Mr. Turnbull (Messrs. Wray and Sons), Mr. T. E. Freshwater (Messrs. Newton and Son), Mr. H. W. Hobson, Mr. T. P. Watson, and Mr. H. R. Fairbanks.

As we have been requested not to publish the decisions at this series of meetings, because such publication would anticipate the report of the Committee, it would be of no use to publish the discussions which led thereto. Last Wednesday, Dr. Edmunds gave the meeting some of the benefit of his large experience relating to the construction of standard screws for scientific purposes. The resolutions about two standard flanges passed at the previous meeting were rescinded to clear the ground, because of the much larger attendance last Wednesday. Certain other resolutions as to the standards to be recommended for adoption for the flanges of lenses of all sizes were then passed, but not unanimously, for some of the larger opticians objected; the chief point of difference of opinion was as to the exact size of a standard flange approximating to 1½ inch in diameter. In the course of the meeting Mr. Taylor remarked that the opticians had but power to make recommendations to the Convention Committee, upon which Mr. Watson opined that if those present agreed to make certain standard flanges, those flanges would become the standards for the whole world; whereupon Dr. Edmunds remarked that those who would exercise most authority in the matter would be the public.

The Chairman announced that if the Committee desired to consult the opticians again, it would invite them to meet in London shortly before the opening of the Convention.

AN INTERNATIONAL PHOTOGRAPHIC EXHIBITION IN VIENNA.

An influential International Photographic Exhibition, or "Photographic Salon," will be held in Vienna in April next year, under the management of the Vienna Club of Photographic Amateurs. The regulations have not yet been formulated, but the general idea is to exhibit only first-class and comparatively recent work, and to make quality rather than quantity the predominant feature. A jury of artists and photographers will decide as to the admission, or otherwise, of each picture. The exhibition will be held in the Imperial Austrian Museum of Art and Industry. Mr. Carl Ulrich, vice-president of the Club, who is now in London, has furnished us the above particulars. The president is Mr. Carl Srna, the Club of Amateur Photographers, Wallfischgasse 4, Vienna.

In the course of his lecture last Friday at the Royal Institution, Professor Meldola said that euprous chloride is as sensitive to light as chloride of silver, and he performed an experiment in proof thereof.

ASTRONOMICAL PHOTOGRAPHY.

BY WILLIAM E. PLUMMER, M.A., F.R.A.S.

On a very superficial survey of the history of astronomy, we may easily perceive distinct epochs at which its further progress as an observational science is apparently barred, and as easily recognise the improved mechanical means whereby those barriers have been removed and a new and wider field of research opened up to patient investigation. The discovery of the telescope, coming as it did when naked eye records had accomplished their utmost accuracy, marks such an epoch; the discovery of the principle of the achromatic telescope, which happily surmounted the inconvenient difficulty presented by the enormous focal length necessary for the due performance of a single lens, marks another. And now, when we see this principle carried to such an extent in the manufacture of huge object glasses as to tax alike the powers of the optician to fashion, and of the engineer to mount, we have, in the application of photography, a possible means for the prosecution of astronomical science into regions of unexpected interest. We may, therefore, hope that astronomy as a science has not yet culminated, and that, so far from being effete, there are still awaiting solution, problems which will only be suggested by further developments in mechanics and optics.

We have alluded to the application of photography as marking an era of increased activity and further progress in astronomy. It would have perhaps been more correct to have insisted on the employment of the gelatine dry plate, as the date from which this new departure is to be reckoned; for the peculiar principle which gives importance to this method of research is its capacity for rendering available the accumulative effects of feeble light when exercised over considerable intervals of time. In the days of the wet collodion plate this valuable result could not be made effective, and consequently its application, though valuable for accuracy of delineation, secured what would have remained little more than scientific curiosities. It is not intended here to suggest that the early photographs of the moon taken by De la Rue, Rutherford, and others possess no value; but it must be remembered that they show no more detail than do our telescopes of moderate power and excellence. They do not mark any material advance in astronomical science. They exhibit the potentiality of advancement which the further progress of photography has converted into a reality. The negatives taken thirty years ago, when De la Rue and Berkowski photographed the coronal appendages of the sun during a total eclipse, taught us no more than that their shape and position could be accurately depicted for all time on a sensitised plate. It was undoubtedly in this respect a great advance over sensational hand-drawn pictures; but if the sensitiveness of the plate had not improved, and especially if the film had still to be used in a wet condition, photography would never have advanced to such a point as to be considered an engine, and a powerful engine, in astronomical research. The same remark applies to Bond, of Harvard, laboriously photographing a few of the brighter double stars in the heavens, the discussion of the measures of which showed no improvement on the micrometrical measurements of ordinary telescopes. The practical confinement of photography to such bright objects as the sun and moon, for years after the early and praiseworthy attempts of De la Rue and Bond, proves how little, in its

earlier stages, it was thought to be a serious competitor as an instrument of research with the largest made telescopes.

But as soon as the dry plate enabled us to store up the accumulated effects of the minutest points of light till they could be rendered visible on the negative, it was evident that we possessed a method of recording the aspect of the heavens with a delicacy and minuteness that were only limited by the mechanical difficulties of the operator. The exertions and experiments of photographic chemists, at first undertaken with a view of shortening the exposure, and rendering permanent very transient effects, have supplied astronomers the means of operating in a very different direction, who, by enormously increasing the exposure, have been able to perceive the traces and register the effects of constant but very minute sources of light.

In one sense it must be remembered that the photographs taken by the astronomer are pictures of very transient duration, and they are taken under exceptional difficulties which do not affect the ordinary operator. His instrument and his camera are being carried on the earth's surface with a velocity of several hundred miles an hour, while the object he is photographing does not partake of this motion. Consequently, he is often several thousand miles distant at the end of his exposure from the spot where it was commenced. This is ordinarily expressed by the motion of the heavens, and except the astronomer has some effectual means of overcoming the difficulty arising from this source, and maintaining the direction of his lens and camera unaltered in space, it is evident that he will not be able to ensure the light from a star constantly falling on the same spot of his sensitised plate. Two defects would therefore exhibit themselves on the development of the latent image: the bright stars or objects that are easily and at once photographed would trace lines on the plate indicating the direction of the earth's motion on its axis, while the fainter stars requiring long exposure to impress their images on the film would not be visible at all. The greater part of the motion necessary to counteract this difficulty is given to the instrument by means of clockwork, whose rate is so regulated as to carry the telescope with the same velocity as the earth revolves, but in an opposite direction. Consequently, if the telescope be pointed to a star and the clockwork be put into action, the instrument would theoretically remain pointed towards that star, however long the exposure was continued. But clockwork, however carefully made, and however ingeniously controlled by mechanical appliances, will never move with the perfect uniformity of the earth's rotation. Therefore it is necessary for the observer to attach a telescope to his photographic apparatus, and to keep a star seen through it accurately bisected by a wire, by slight correcting motions given to the telescope, when he perceives that the star has moved away from the wire by the smallest perceptible quantity. Nor is this his only difficulty; for owing to atmospheric refraction, which depends upon the star's altitude, and which, of course, changes during the exposure, a star will move slowly, but perceptibly, in a manner that no clockwork can adequately follow, and the continual adjustment or removal of this source of error can only be effectually remedied by minute alterations of the direction of the telescope in space. When, therefore, a plate is taken of two, three, or four hours' exposure, it means that an observer is all the time watching the behaviour and motion of a star in a connected telescope, with the view of removing or nullifying such slight deviations from regularity as the imperfections of mechanism or the physical circumstances of refraction necessarily introduce. For, without such precautions, and without a very considerable amount of care and attention, it is impossible to produce that kind of picture in which the stars are shown on development as perfectly round, hard, and small discs, various in size according to their magnitudes, the brighter the star the larger the photographic image.

The method of development is at the choice of the operator; but since accurate measurement of the distances between these minute discs is generally required, it is prudent to obtain as fine a granulation as possible. Hydrokinone gives generally very good results, but those who wish to force the utmost from their plates are rather in favour of a ferrous oxalate development.

Either of the two kinds of telescopes in use among astronomers, namely, the reflector and the refractor, is or can be made, available for photography. But there is this difference. In the former case, the reflector, all the rays, whatever be their colour or wave length, are brought to one and the same focus, and therefore such an instrument is immediately available. In the achromatic refractor as hitherto applied, the rays have necessarily suffered dispersion in passing through the object glass, and the labour of the optician is devoted to bringing the brighter rays of the visible spectrum to a common focus, while the rays about G, in the solar spectrum, the most sensitive for bromide of silver plates, are brought to a focus, or at least converge to a focus, at a point necessarily at some distance from the most suitable for visual rays. Hence in a refractor the plate is not exposed at the visual focus, and a particular form of object glass has to be selected in order to secure rapidity of action and precision of image.

The advantage appears, therefore, to lie on the side of the reflector, and it was, accordingly, with those instruments that the earliest attempts at astronomical photography on an extended scale were conducted. When we consider that a reflector is a simpler optical arrangement, that it is less costly in construction, that it is available alike for all rays of the spectrum, and can, therefore, accommodate itself to any prepared film, it is not a little surprising that most energetic efforts, finally crowned with success, have been made to adapt the refracting form to the purposes of this method of research. It is, however, a fact that, in the past, nearly all the serious astronomical observations have been made with refractors. The explanation of this rather curious fact is not hard to seek, but it would lead us too far astray to discuss the point here. The reason for noticing it is, that it was probably felt that if photography was to reap a wide and abundant harvest in the future, refractors must be constructed to play the same conspicuous part in the new astronomy as they have done in the old. And, undoubtedly, the credit for the due appreciation of this fact, and for taking the steps necessary to secure its accomplishment, belongs to French ingenuity, the ablest exponents of which, in this branch, are the brothers Henry, of the Paris Observatory. Of the permanent success which has attended their exertions it is too early to speak with confidence, but it must be admitted on all hands that they have fully appreciated the advantages to be gained, and manfully coped with the great difficulties that barred further progress.

It would extend this article to an interminable length to

attempt to give even a catalogue of the various purposes to which photography has been, and is being, applied in the region of astronomical research. To some of the more important and more interesting we shall hope to refer on a future occasion, and show how objects of which the largest telescopes had not revealed the presence, have accurately depicted themselves on a sensitised film; how variations which the eye cannot appreciate have been made easily visible; how labour has been saved, and time has been shortened. The success has been so rapid and so marvellous in the past, that it would be bold to forecast for it any ultimate failure in any direction, but there are difficulties which have not yet been wholly overcome, and of which it is not easy to see the solution.

It may be as well to point out some of these apparently unavoidable drawbacks. It is evident that if a plate be exposed for some hours in order to secure the record of the position of the faintest stars in a given district, it is inevitable but that the brighter stars must be over-exposed. Indeed, it not infrequently happens that a reversion of the negative image supervenes, and this long exposure is attended with this inconvenience, that the size of the image of the brighter stars becomes so large, that they are extremely difficult to bisect with the necessary precision, or to determine the centre of action whereat the photographic image commenced which would correspond with the position of the star in the sky. The periphery of the image is generally of so loose a texture that it is impossible to determine this point from measures made at the circumference. And further, considered as a picture it is a failure, because the brightest stars appear as points in the sky without any sensible area, and for accuracy of reproduction the negative should reveal them equally minute. The effect of brightness in the sky is translated on the negative by increased area.

This defect of over-exposure is still more strikingly shown in the photographs of bright nebulæ, where it frequently happens that when a plate has been exposed long enough to secure the detail in the fainter parts, the brighter portions show a mass of uniform density. This difficulty is partially removed by taking exposures of varying length, in some of which all the details will have received the proper exposure, and then constructing a picture of the whole, from the study of its several parts. And lastly, it may fairly be urged that a photograph has no power of discrimination to seize the momentary and best view of a celestial object. If the exposure be carried on through a short but perceptible interval, the effect registered on the sensitised film is the sum of all the varying aspects, which, owing to atmospheric tremor and many other causes, the object successively presents during that interval. The final result may be compared to the effect which would be produced by overlaying many images of the same object taken with a camera in minute but rapid vibration.

West London Photographic Association.—On the 9th the annual smoking concert took place at the Richmond Hotel, Shepherd's Bush Road, under the chairmanship of Dr. Low. The programme was in itself a work of art, having been photo-etched by Mr. Walter L. Colls from a design by J. Martin Dickens. On the 3rd about thirty members of the Society met at "Jack Straw's Castle," Hampstead, and spent an afternoon in seeking "bits" in the neighbourhood of the heath. On the 17th, twenty-eight members sought out some of the charming scenery in the vicinity of St. George's Hill. While the members were waiting for their evening repast, Mr. J. D. England exposed two whole-plate celluloid films upon them.

THE PHOTOGRAPHY OF THE MORE REFRANGIBLE RAYS.*

BY V. SCHUMANN.

Fluorite in perfect white crystals is now-a-days such a rare mineral that it is hardly to be got, even in small paltry pieces, and not at all in large ones. My optical installation certainly contains a fluorite prism, but it is, in consequence of many faults, so defective that its application to the end I had in view was not to be thought of. After having for years vainly endeavoured to obtain such a prism as I desired, my researches on the ultra-violet rays would have remained completely blocked, but that I fortunately was able to obtain, though only as a loan, a fluorite prism and lenses, both of unusual size and purity.

With this fluorite apparatus I renewed my researches, and was, thanks to its excellent definition, immediately enabled to go somewhat more closely into the question of the absorption of light by quartz.

In the first instance I confined myself to observation of the fluorescent spectrum as shown when a plate of uranium glass is brought into the path of the rays. When I, during the observation, introduced a plate of quartz between the source of lights and the slit, I found, at all events with the thicker plates, that the brightness of the image was visibly diminished, and by so much more to the eye as the quartz plate was thicker. The largest quartz plate, which was 5 c.m. in thickness, stopped the more refrangible rays entirely. The less refrangible rays, on the other hand, were but slightly similarly affected.

I am far from arguing that the total disappearance of the particular spectrum region proves the total absorption of the rays. The physiological effect stands on a different ground from the photographic effect. The whole fluorescence spectrum is, however, so badly defined in comparison with the photographic image, that I must give the preference to the latter, even when its sharpness leaves much to be desired. After the somewhat crude earlier experiment the registration of the absorption by the rays was taken in hand. On account of its energetic action I chose for this purpose the aluminium line No. 32. Although the photographs—about 100 in number—that I made for the purpose do not enable me to give an exact numerical table of absorption, yet I can state with tolerable certainty that films of quartz up to a few millimetres in thickness keep back the ultra-violet rays but very little; but on the other hand, if of 10 m.m., and still more of 20 or 30 m.m. in thickness, the quartz retards the exposure of the rays at the end of the ultra-violet in a very pronounced degree. Whether the yet more refrangible rays behave in the same manner as the aluminium line No. 32, I am unable to say. A circumstance to be mentioned later on led me to the conclusion that if there is any difference it cannot be a very considerable one.

Following these results I was able, without much difficulty, to increase the permeability to light of my spectrograph, which was fitted up with a quartz prism and quartz lenses. I reduced the thickness of the quartz through which the light had to pass by replacing the lenses hitherto used by thinner ones (2·2 m.m.) and by shifting the prism so that its edge approached more nearly the centre of the field of light of the collimator lens. In this way the thinnest portion of the prism—that is, the margin at the refracting angle—was made much more use of than

* Continued from page 382.

when the prism, as is customary, stands in the middle of the field of light. With the speetrographic apparatus thus remounted I was able to photograph all the rays, even to the most refrangible, as with fluorite. It only requires longer exposure, in order to attain to the performanee of the latter. These photographs yielded the noteworthy result that, with a sufficient lengthening of the exposure, quartz is not less well suited to the photography of the less refrangible rays than is fluorite.

When I was in the fortunate position of being able to farther prosecute my researehes by means of a fluorite apparatus, I hoped to find a quantity of new lines beyond those which my earlier researehes had diseovered. The first experiments, having this end in view, undeeeived me completely, the following ones not less, and even the last of several hundred, earried on with inereased power of the electrie spark, gave no more evidenee of a fulfilment of my desire for more light in this direetion.

Beyond the wave-length 1820 there reigned with the fluorite apparatus the same absolute darkness for the gelatine plate as in the speetra obtained with quartz. Whether there is really no aetion of light in this dark region, or whether the bodies analysed did not yield any rays in that plaee, or whether the silver moleeule on the plate so obstinately refuses to yield to rays of shorter wave-length any image that ean be developed, must provisionally be left undetermined. Of great influenee upon the sensitiveness of the plate appears to be—as my earlier researehes taught me—the enormous *impermeability of gelatine to light of all rays more refrangible than the cadmium-line* No. 18. In my experienees of later date I found that, for example, a gelatine film of only a few thousandths of a millimetre in thiekness suffieed to prevent the passage of the whole of the spectrum beyond the cadmium line No. 24, and that for the absorption of the last of the aluminium lines a yet thinner film suffices. Like gelatine, also behave eollodion and gum arabic. There now remains to me the hope that experiments with other elements—I have it in view to search for the more refrangible rays in the speetra of the elements that I have not yet tried—may enable me to diseover lines of shorter wave-lengths. With the eleetrodes of the aforementioned metals that I have already employed, further suecess may be obtained by the use of an eleetrie spark of greater energy than that of the apparatus I have hitherto applied to the purpose. Having this in view, I propose to repeat the whole of my experiments.

Hitherto, my electrieal apparatus has consisted of a chromie acid battery of four large elements, a Ruhmkorf indicator eoil for a spark of 25 em., and twenty Leyden jars 40 em. in height. For my future work I have prepared ten Grove cells of unusual size (the platinum eleetrode measures 10 by 19 em.), a Ruhmkorf induction coil for 50 em. spark (secondary coil 75,585 windings of about 54,000 metres in length, and 68,000 resistance) and a Ries battery of nine Leyden jars of 40 em. in height. Perhaps with this more powerful apparatus I may find more lines, as well as more refrangible ones, than in my former observations.

I refrain, as before stated, for the present from a more detailed description of my photographic apparatus. I propose to furnish a complete aecount as soon as I have by further experiments thoroughly proved its capability.

I will now conclude with some details of the power on light of my apparatus. My old speetrograph, even with long continued exposure, and with the slit opened wide, about ½ m.m., only onee gave me the aluminium line mentioned, and then only in weak diseontinuous streaks. With the fluorite instrument an exposure of two seeonds sufficed to obtain a photograph of the before mentioned aluminium, and that with a slit of 0·080 m.m. opening. We need go no further to diseover the extraordinary power of light of the later instrument.

The energy of the less refrangible rays of the ultra violet part of the speetrum with this instrument is so overpowering that I had never known the like. A few minntes' exposure suffieed to solarise many of the lines of this position of the region. Such lines are washed out in a eompletely exposed speetrum. Of all the speetra that I have photographed, those of sodinm, bismuth, and ehromium give the most powerful solarization; with chromium the solarisation goes to such an extent that the whole speetrum appears as light stripes, strewed with lines of slight intensity. The uneommon light power of my speetrograph has been of speeial service to me in making the extensive set of photographs of the region of the spectrum that was nndertaken.

A STANDARD METHOD OF DEVELOPMENT.*

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

Method of Experiment.—Four well-known eommereial brands of plates were seleeted, of as widely diffcrent and as representative eharacters as possible, viz., Wratten and Wainwright's Ordinary, Ilford White Label, Mawson and Swan's Castle, and Thomas's Thickly Coated Landscape. They were exposed for 30 seconds behind a Warnerke screen at a distanee of 1 metre from a standard light consisting of one square centimetre of the brightest part of a Silber Argand working at full power. It was believed that a Warnerke screen would give results sufficiently accurate and coneordant for the purpose in hand, and the coneordanee betwcen the results, and the fact that there was rarely any doubt as to whieh was the eorrect number, justify this belief.

Development was eonducted in a room which had a praetically constant temperature of 16° C. (62° F.), and when finished the plates were rapidly rinsed, immersed in acidified alum to arrest development, well washed, and fixed in the usual way.

The sensitometer numbers were read off both before and after fixing. The praetiee of different experimenters differs in this respeet. Whether a number which is just visible by reflected light before fixing will be visible by transmitted light after fixing depends, of course, upon the density whieh the deposit has acquired, and sinee from a practical point of view it is efficient or printable sensitiveness that we wish to measure, to read after fixing is perhaps the better plan. In the eourse of numerons and extended series of comparative experiments in another connection, I have found that more concordant results are obtained by reading after fixing.

In order to eliminate as far as practicable the influence of air on the developer, development was in several cases eonducted in dipping baths of the old pattern, the tops of whieh were elosed by thick, flat pieees of india-rubber, cut to shape, and fastened down by india-rubber bands which passed round the bath. The bath was completely filled with developing solution.

* Continued from page 376.

The results are given in the table; B F = before fixing; A F = after fixing.

In (*a*) all the plates showed slight chemical fog, and in (*b*), with a longer time of action, the amount of fog was very considerable.

Diluting the developer with an equal volume of water, the proportions of the constituents remaining the same, practically prevented chemical fog when development was not prolonged (*c*), but the density* in all four cases was slightly less than in (*a*). With prolonged development all the plates were badly fogged (*d*).

Double the amount of bromide also practically prevents chemical fog with short development (*e*) and (*f*), although the density in (*e*) was slightly less in all four cases than in (*a*). With long development, however, there was considerable fog (*g* and *h*), though in all cases decidedly less than in (*b*).

Continual rocking of the dishes during development as opposed to occasional rocking (*e* and *f*), has no effect on the final result as regards degree of sensitiveness. In all cases the density was slightly greater with continual rocking (*f*), but the gradations were distinctly better when the dishes were only rocked three or four times in the course of five minutes.

Development in open dishes with occasional rocking gave the same numbers (*g* and *h*) as development in closed vessels, but the amount of staining was greater under the former conditions.

The discolouration of the developer is due mainly to the action of the air upon it, and only in a very slight degree to its own action on the plate. Even after development for an hour in closed vessels the liquid has only a pale sherry colour.

With regard to time, five minutes is not quite long enough to obtain the maximum effect with certainty. Prolonged development, however, tends to chemical fog, which was strongly marked in all cases where development was continued for an hour. The fact that the chemical fog was greater in (*d*) than in any other case where ammonia was used indicates that the amount of fog is a question of time quite as much as of the concentration of the developer.

Sodium carbonate, even in large quantity (*i*), acts more slowly than ammonia, the density being lower in all four cases than in the corresponding cases in (*a*) or (*e*). These plates were free from chemical fog, but in (*k*), after prolonged development, the fog was very dense. Reduction of the proportion of sodium carbonate to 10 parts in 1,000

Parts by weight in 1,000 parts by measure.	Time and conditions of development.	T.C.L.		Castle.		W.W.O.		Ilford R.	
		B F	A F	B F	A F	B F	A F	B F	A F
(*a*) Pyro 5 ; am. brom. 2·5 ; ammonia, NH_3, 2·5	5 minutes : open dish	10-11	10	15	11	10-11	10	15	13-14
(*b*) Ditto ditto	1 hour : closed vessel	10	10	15	15	10-11	10	17-18	15
(*c*) Pyro 2·5 ; am. brom. 1·25 ; ammonia 1·25	5 minutes : open dish	10	10	15	14-15	11	10	15	14
(*d*) Ditto ditto	2 hours : closed vessel	10	10	15	15	10	9	18-19	15
(*e*) Pyro 5 ; am. brom. 5 ; ammonia 2·5	5 minutes : open dish : occasional shaking	10	10	14	13-14	10	10	14	13
(*f*) Ditto ditto	5 minutes : open dish : constant shaking	10	10	14-15	14	10	10	14	13-14
(*g*) Ditto ditto	1 hour : open dish	10	10	15	15	11	10	17-18	15
(*h*) Ditto ditto	1 hour : closed vessel	10	10	15	15	11	10	17-18	15
(*i*) Pyro 5 ; sodium carbonate 25 ...	5 minutes : open dish	—	8	—	14	—	10	—	14
(*k*) Ditto ditto ...	1 hour : closed vessel	—	10	—	15	—	10	—	15
(*m*) Pyro 5 ; sod. carb. 10 ; potass. brom. 2·5	½-hour : closed vessel	—	—	15-16	15-16	10-11	10	15	15

failed to prevent fog with long development. Addition of potassium bromide in quantity equal to 2·5 parts in 1,000 prevented chemical fog, even when the plates were developed for half an hour; but the action of the developer was slower and the density less.

In presence of sodium carbonate and absence of sulphite, pyrogallol solution so rapidly becomes of a very dark colour, and stains the film so badly, that if this alkali is used in the standard developer development must always be done in closed vessels. It is also well to bear in mind that sodium carbonate has a considerable tendency to produce frilling.

Temperature is well known to exert great influence on the rate of development. If the solutions are much below 15° C. (60° F.), it is with most plates almost impossible to get density. According to Eder's experiments,† however, brom-iodide plates which gave 14° when developed for three minutes with sulpho-pyrogallol and ammonia at 2° C. (35·6° F.) only gave 15° when development was conducted at 26° C. (79° F.). It seems, therefore, that temperature has a much greater effect on the density of the image than on the degree of sensitiveness indicated by the sensitometer number. It is, however, important to fix a standard temperature at which development shall be conducted.

It is important to note that whatever the composition of the developer, *if sufficient time was given*, the maximum sensitometer number obtained was *constant for each brand of plates*. It follows that, provided that the developer is allowed to act so long that it produces its maximum effect, variations in its composition are without influence on the degree of sensitiveness registered, but affect the gradations by determining the rate at which development takes place. Mr. Lyonel Clark, as a result of his elaborate experiments with developers of all kinds, has previously arrived at the conclusion that "the action of light is absolute: that is to say, a certain quantity will effect a change in the haloid salts, and any substance capable of developing will, in a greater or less time, make this change apparent" (*Phot. News*, 1889, p. 832).

My own experiments afford independent confirmation of Mr. Clark's conclusion. In this result we have further evidence of the necessity for distinguishing clearly be-

* "Density," here and in the following paragraphs, refers to the density generally, but more especially to the density of the highest numbers.

† *Photo Corr.*, 1883 p. 87.

tween the three different stages of development, on which I insisted in my recent paper at the Camera Club Conference (*Camera Club Journal, Conf. No.*). Variations in the composition of the developer do not *limit* the formation of the primary image, but only affect the rate at which it is formed.

Upon the basis of these results, combined with general experience, I recommend the following standard developers and methods:—

I.—*Standard Pyro-Ammonia.*

5 parts pyrogallol, 5 parts ammonium-bromide, 2·5 parts of real ammonia, NH_3, in 1,000 parts by measure of the solution.

Develop for 10 minutes in an open dish or closed vessel, with *occasional* rocking, at a temperature of 15° C. (60° F.).

II.—*Standard Pyro-Soda.*

5 parts of pyrogallol, 10 parts anhydrous sodium-carbonate, Na_2CO_3, 2·5 parts potassium bromide in 1,000 parts by measure of the solution.

Develop for half-an-hour in a closed vessel at a temperature of 15° C. (60° F.).

Of the two I decidedly prefer pyro-ammonia. It acts more rapidly, and gives more uniform results with plates of various kinds. The only drawback is the necessity for determining the strength of the ammonia solution; but this operation takes very little time, and demands no more manipulative skill than will be possessed by any photographer whose work necessitates the use of a standard developer at all. Titration of the ammonia is little, if any, more trouble than the drying of sodium carbonate. A large quantity of ammonia solution can be made up at once, for at this degree of dilution its strength does not alter even in summer, provided that the bottle containing it is kept in a moderately cool place.

Some brands of plates will not stand the quantities of alkali (ammonia or sodium carbonate) recommended without giving more or less chemical fog, but it may safely be said that the quality of such plates is not of the highest desirable standard. All the plates of best repute are not fogged by the proposed standard developers.

Preparation and keeping of the Solutions.—The developer in either case must be made up in two solutions, which are mixed immediately before use. The pyrogallol should be dissolved in *distilled water*, and although it may be kept for two or three days in a well closed bottle out of contact with all traces of ammonia fumes, it is much better that it should be dissolved when it is wanted. This plan involves very little trouble, and occupies only a short time.

Standard Pyro-Ammonia.

A.—Ammonia, NH_3	... ...	5 parts
Ammonium bromide	... ...	10 ,,
Water up to	... ...	... 1,000 ,,
B.—Pyrogallol	... ...	... 10 ,,
Water up to	... ...	... 1,000 ,,

Mix in equal volumes immediately before use. It is obvious that the mixed solution will have the composition proposed for the standard developer.

The ammonia and ammonium bromide solution will remain unaltered for a long time if not kept in a very warm place, and may therefore conveniently be made up in large quantity. It is better to keep it in several bottles of moderate size than in one large bottle, partly on the score of convenience, partly because any accident happening to one of the bottles does not spoil the whole stock of solution.

In making the ammonia solution we have first to calculate how much of the "Diluted Ammonia No. 1" will be required. The titration with standard oxalic acid has given the number of centigrammes of real ammonia in 10 c.c. of the solution, or in general terms, the parts of ammonia *by weight* in 1,000 parts *by measure* of the solution. Suppose that 10 c.c. of the ammonia solution required 15·4 c.c. of standard acid, then the 10 c.c. contain 15·4 centigrammes of real ammonia, or 15·4 parts by weight in 1,000 parts of the solution by measure. We require to know how much of the solution will be required to give us 5 parts of ammonia, the quantity contained in the standard solution. Obviously—

$$\frac{5 \times 1{,}000}{15{\cdot}4} = \text{volume required,}$$

or in general terms—

$$\frac{5 \times 1{,}000}{\text{parts of ammonia in } 1{,}000} = \text{volume required.}$$

or

centigrammes in 10 c.c.

Weigh out 10 parts of ammonium bromide into a flask holding 1,000 parts by measure, add a small quantity of water, and when the bromide has dissolved, add the volume of "Diluted Solution No. 1," given by the calculation, and dilute up to 1,000 parts.

An operator accustomed to the use of the metric system will find no difficulty in making up the solutions. Any one who uses English measures will find it convenient to make up 16 ounces, *i.e.*, 7,000 fluid grains, or 10,000 fluid grains. The former quantity requires 70 grains of ammonium bromide and 35 grains of real ammonia, the latter 100 grains of bromide and 50 grains of ammonia. Measuring flasks graduated to 1,000 or 10,000 fluid grains can readily be purchased. Grains and fluid grains only should be used, and *minims should be avoided.*

Standard Pyro-Soda.

A.—Anhydrous sodium-carbonate	... ...	20 parts
Potassium bromide	... ...	5 ,,
Water up to	... ...	... 1,000 ,,
B.—Pyrogallol	... ...	... 10 ,,
Water up to	... ...	... 1,000 ,,

Mix in equal volumes immediately before use.

The sodium carbonate solution is made by dissolving the weighed quantities of the solids in water and diluting up to 1,000 parts. It may be kept for a considerable time, but the solution is very liable to attack and dissolve certain kinds of glass.

Of the proposed standards it may be said—

(1) That they agree very closely in composition with the developers used in ordinary practice.

(2) That they do not produce chemical fog on plates of good quality when allowed to act for a time sufficient to develop the maximum sensitometer number which they will give.

(3) That the proportions of the constituents are simple, the materials are easily obtained in a state of purity, and the solutions are readily prepared.

It seems, therefore, not too much to hope that they will meet with the favour of those whose work requires the use of a standard developer of general applicability.

The Photographic Club.—Subject for discussion May 28, "Photographic Fog"; June 4th, "Photo-Mechanical Processes." Bank Holiday outing at Uxbridge; train from Paddington 10.55, Westbourne Park 10.58.

GROUPS AND GROUPING.

BY C. BRANGWIN BARNES.

The photography of groups, either family, wedding, picnic, scholastic, regimental or otherwise, is a branch business in itself, and is treated as such by some firms, who manage to make a remunerative branch of it. It is a great pity that the military group business should be mainly in the hands of a foreigner; were his business premises in England I should not grumble, but the facts of the matter seem to be that up till now no English photographer has been found enterprising enough to travel round the various military centres and photograph the men of the regiments there stationed in companies, purely "on spec."

It has been left to a Frenchman to take the necessary risk, and from all appearances he seems to make a good thing of it; his operator in this country takes the negatives and the work is finished in Paris. Although I personally have strong objections to a foreigner monopolising this branch of the business, I am not prejudiced as to his work, which I must unequivocally state is uniformly good; the pictures are whole-plate size, well grouped and lighted, properly exposed, nicely retouched and printed, enamelled, and supplied in cut mounts at, I believe, two shillings per copy. As the average number of copies sold from each negative would be about fifty, this should be well worth doing, and I would here remark that the old proverb, "Anything worth doing, is worth doing well," applies strongly to taking photographic groups. If a group be well taken, every individual composing the same will purchase at least one copy, so that the better the picture, the more remunerative will it be to the photographer.

The great question in taking a group out of doors is to select a good light—direct front light is far too often used, with the result that the pictures are much too flat and poor; a side light should always be chosen, the space to be occupied by the group apportioned and focussed before the subjects are grouped.

This latter operation can be performed with the aid of one or two persons placed at the edges and centre of the space selected, and care should be taken in selecting just the necessary diaphragm; too large a stop will of course give the edges out of focus, and at the same time should too small a one be used it will unnecessarily lengthen the exposure, which is an important question when the steadiness of some thirty or forty persons has to be considered. When this part of the process has been completed, the figures should be grouped as rapidly and carefully as possible, due note being taken as to the colours of costumes, light and dark portions being so arranged as to balance properly and make a harmonious whole.

Grouping completed, a glance should be given at the composition from the front of the lens, to ensure that no one is hidden behind another, the word should be given and the exposure made, immediately followed by a second and perhaps a third. Nervousness and fussiness on the part of the operator should be avoided, as it is sure to create a lack of confidence on the part of the sitters if exhibited. In a group of any large number, there are sure to be one or two amateurs who will be free with suggestions as to what you might or ought to do; these must be quietly and at the same time politely ignored; if you let them see that you thoroughly understand what you are about, and are yourself confident of a good result, they will usually, in vulgar parlance, "dry up," and leave the arrangement in your own hands. Where the group is composed of a large number of persons, I would recommend that the size of picture taken should be at least 12 by 10, and whenever it can be managed, 15 by 12; the larger the picture the more imposing it looks, and the better the orders.

Groups look elegant when vignetted and mounted in contact with bevelled glass, so-called opalines; the only objection to this style of finish being that they look somewhat smaller than when mounted on card with a three or four inch margin, but the increased delicacy is an advantage which should outweigh the disadvantage of size.

THE PROGRESS OF THE PHOTO-MECHANICAL PRINTING PROCESSES.

BY HERMANN E. GUNTHER.

I.

Many an improvement has been made in connection with photo-mechanical printing processes since my last reports on this special branch of photography were published in these pages,* so that I think it desirable to take a brief survey of the most important advances and successes which deserve to be recorded.

Photo-zincography and Photo-lithography.—For taking prints from a prepared zinc plate in the lithographic press the bichromated albumen process is still much used in Germany, because it is about twelve times as sensitive as the asphalt method, though the latter gives finer and sharper lines. In this process the zinc plate, previously poured over with warm water, is coated with a thin film of bichromated albumen, and, after drying, exposed beneath a negative. The zinc plate is then rolled up with transfer ink, and placed in water, until it can be developed by means of a pad of cotton wool. In developing, the sensitive albumen film is sometimes rubbed rather briskly, to remove tone;† this, however, causes the lines of the image to be damaged, though only to a slight degree. But afterwards, in etching the picture, the etching fluid enters into the channel thus produced, and quickly enlarges it, so that the lines damaged during development are soon entirely broken up. This defect may be almost entirely avoided by the following method, recommended some time ago by F. O. Moerch. An asphalt solution is prepared in the well-known manner, and, after filtering, is poured over the exposed bichromated albumen film. A slight degree of heat accelerates the drying of the coating of varnish. After drying the plate is immersed in a dish of luke-warm water from half an hour to two hours, according to the amount of exposure which the albumen film has had beneath the negative. During this operation the albumen film becomes hygroscopic, but only at the parts which have been protected from the action of light, and the asphalt coating is loosened by this reaction. If now the film be slightly rubbed by means of a fine pad of cotton, the lines will come out sharply and completely. They can hardly be damaged, because the asphalt coating, if once dry, becomes exceedingly hard where it rests on a dry ground, whilst it becomes brittle and friable where the base is damp.

* See Photographic News, xxxii., page 98, 155, 197.

† It may be remembered that by the "terminus technicus" *tone* or *false tone*, that action of light is understood which extends over the parts of the film that were entirely covered by the negative, and which imparts to the impression a flat appearance.

A useful invention has been made by the firm of Wezel and Naumann, of Leipzic, who prepare zinc plates as a substitute for lithographic stones. This is done in the following manner: lithographic stone is dissolved in a mixture of sulphuric and hydrochloric acid, and to the solution is added a mixture of an asphalt solution and resin with some good oil-soap, such as sebacylic lime. After removing the superfluous acid by evaporation, the residue is dried to powder, which is now a combination of sebacylic lime and sulphate of lime. The dry powder is then mixed with a weak solution of soda, and by a steam injector sintered on the hot zinc plate, which thereby receives a coating equal to that of the natural lithographic stone. These prepared zinc plates are treated in the same manner during the transfer process as lithographic stones, only the etching is somewhat modified, inasmuch as phosphoric acid with diluted gum arabic is used instead of hydrochloric acid or aqua fortis. More than 6,000 prints may be obtained from one transfer, and the zinc plates are suitable for any kind of transfer, as well as for any lithographic pen and ink or chalk work.

An original method of photo-zincography has been adopted by a well-known German establishment. As I am told, it is the same process which is in use in the photographic department of the Belgian School of Civil Engineering for the reproduction of plans and maps. In this process, zinc of the factory of the "Vieille Montagne," in Belgium, is used, which bears the numbers 8 to 10, according to the surface of the sheets. The plate is at first cleaned in a solution of nitric acid of 8 per cent., and then polished and washed in plenty of water. The plate is then again placed in the nitric acid bath until it has acquired a uniform silver-grey appearance, when it is removed, again rubbed and thoroughly cleaned, and finally coated with a gallic solution. In the above-mentioned establishment this solution is prepared as follows: 75 grammes of nut-galls are broken and dissolved in 1,500 c.c. of water. The solution is reduced to one-third its volume by boiling; next it is mixed with 125 grammes of gum arabic, 25 c.c. of hydrochloric acid, and 12 c.c. of nitric acid, and then filtered. The zinc plate is coated with this solution by means of a flat brush. When the coating is dry, the plate is washed, dried, and coated with the following sensitive solution:—

Asphalt	...	...	...	20 grammes
Oil of lemon	...	...	...	15 ,,
Benzine	...	...	...	500 c.c.

which should be filtered after solution. The exposure necessary is from 30 to 40 minutes in the sun, and 2 to 3 hours in diffused light. The development of the plate is effected with essence of turpentine, or, if this does not exercise the necessary dissolving power, with a mixture of this essence with benzine. After development, the plate is immersed in a bath of diluted acetic acid (5 per cent.) to remove the nut-gall and to uncover the lines of the image. In order to transform the image into one which can be machined like a lithographic stone, it is coated with a solution of 100 grammes of absolute alcohol and 5 grammes of gum-lac, by means of a brush, dried, and treated with essence of turpentine, by which the asphalt is dissolved. By this treatment the portions of the zinc plate beneath the lines of the image are uncovered, and the plate can then be rolled up by the use of an aqueous gallic solution, and printed in the well-known manner.

A rapid photo-lithographic process has of late been invented by M. Balagny. A gelatino-bromide plate is placed for a few minutes in a solution of bichromate of potash, when it is removed, dried, and exposed beneath a photographic negative. It is then exposed for a few seconds to light at its back, and then thoroughly washed. The plate is now fixed on the table of a photo-lithographic press, rolled up with fatty ink, and printed in the customary way. Balagny uses gelatino-bromide films, specially prepared for this purpose by M. Lumière, the gelatine coating of which is attached to its pellicular support by a silicated solution. In using ordinary gelatine plates, the film would probably be pulled off in rolling up the plate. By this process a number of photo-lithographic prints can be procured an hour after the negative to be reproduced has been made.

The same process has been for several years in practical use in the Imperial Printing Establishment at Berlin, with the difference that the prints are not taken directly from the negative, but that after rolling up the negative, a transfer is made from it on to a zinc plate.

An excellent method of preserving drawings and photo-engravings on lithographic stones, so that they may be reproduced after a lapse of many years, has quite recently been published by Fr. Sandtner, of Copenhagen. From a stone bearing an engraving, or a photographic transfer, a print is taken, with a solid black ink, on transfer paper, and this print is at once transferred to a sheet of white gelatine, or to parchment paper, which has been coated with a gelatine solution. This transfer is mounted on a drawing board, and by the aid of a flat and soft brush covered with a solution of aniline brown, taking care that no streaks are produced. After drying, it is coated once more, and, when dry, again; the printing ink is washed off with a few drops of turpentine by means of a small pad of cotton. The gelatine transfer is then removed from the drawing board, when it shows a beautifully clear negative, which is perfect to the smallest details. Imperfect transfers can be at once washed off gelatine sheets by means of essence of turpentine, and the sheets may be used again. Negatives of this kind can be preserved for many years if they are varnished with a white turpentine varnish to which some siccative has been added. The picture side is varnished first; then the back of the sheet. This coating of varnish not only protects the negative from moisture, but it prevents folds and wrinkles. Prints from such negatives are taken on transfer paper which has been prepared, in the well-known manner, with a solution of bichromate of potash, and the impressions are then transferred to the stone.

PHOTOGRAPHY IN COLOURS.—In the *Photographic Globe's* editorial notes, the writer says:—"To express an opinion that photography in colours is impossible, or to discredit the announcement that somebody has succeeded in it, is something photographers ought not do. The French did not believe in Daguerre's success until a famous savant introduced his discovery for him, and if anybody claims to have succeeded in colour photography, give him a chance and listen to his statement. It is bound to come, but whether in the form now agitated in Austria, Germany, or on the lines of Mr. Bierstadt of New York, it is impossible to say. Mr. Bierstadt evidently knows more about the subject as connected with process work than any other photographer, and an examination of some of his work in coloured prints, the plates of which were made with chromatic screens, equivalent to the coloured prints, would lead one to believe that chromophotography is not far off.

Notes.

The *Court Journal* is well advanced with its photographic intelligence. It gravely announced in a recent issue that the Photographic Exhibition now being organized by the London Chamber of Commerce was opened on the previous Wednesday week. Our contemporary evidently has got a little mixed between photographs and the plans of the Watkin tower which have been on view in the hall of the Drapers' Company, where, also, the Photographic Exhibition will be held. *Apropos* of the Drapers' Hall, it may be said that no such gorgeous surroundings have ever accompanied an exhibition of photographs. Probably the hanging committee will have some trouble in arranging the pictures so that all shall be equally well lighted, as most of the four or five halls are illuminated only from the sides.

The enterprising people who have been offering a confiding public a "two-pound pastel portrait free" on the condition that it shall be "framed suitably so that the work shall show to advantage," have not thought it worth while to take any notice of the rather damaging correspondence which has been published, and which throws a light on their curious method of doing business. Two persons have related their experience in the *Globe*. This experience is identical. Each sent a photograph, and received an answer requesting the remittance of ten shillings for a frame, as it was to their "mutual interest to have the picture framed by a first-class house." If, the writer went on to say, the purchaser was not perfectly satisfied in every respect with the pastel and frame, the remaining nine shillings need not be sent. In the two cases mentioned, neither thought it worth while to send ten shillings for a frame which had not been seen, and declined the tempting offer, and the coincidence concludes by the inability of both to get back their photographs from the advertisers. What is wanted now to make the story complete is the experience of some person who has complied with the conditions of the advertisers.

Lady William Lennox, who is doing a good business as a milliner, doubtless writes from experience when she says, "some women invariably hate a new gown or bonnet the instant it has been sent home. 'I wish I hadn't bought it; so stupid of me not to remember that I look hideous in that colour always'; or, 'of course, I ought to have known that these sleeves would make me too frightful for words.'" This is the experience all over of the photographer. Some ladies invariably hate their new photographs. Perhaps they discover (a discovery, by the way, not always made known to the photographer) that the dress they were photographed in does not suit them, or that some little peculiarity in the gown has been made manifest by the camera, and so they do not like the photograph. Not a few regard being photographed as they regard shopping—an occupation which demands a great variety to be shown them before they can make up their minds. The idea of having but a single photograph to approve, or the reverse, is a species of Hobson's choice which is almost repulsive. All this makes the photographing of some ladies a nervous undertaking, not to be regarded lightly by the photographer.

Quite an unique collection of photographs is in progress of arrangement at Moscow. The idea has originated with the Baroness Klara von der Deckler, of Tiflis, who has sent a circular letter to the beautiful women of the world, asking them to forward their photographs to her. These photographs will be examined by a committee of artists, and those approved of will be placed in an album to be entitled, "Types of Female Beauty of the last years of the Nineteenth Century," and deposited in a museum at Moscow for preservation. All this is interesting, but one would like to know what plan the Baroness has adopted to find out the beautiful women. She must have names and addresses, because a letter simply addressed, for instance, to the most beautiful woman in London, would have sufficient claimants to puzzle the Post Office.

The Royal Geographical Society has taken a step in the right direction. It is now alive to the fact that there are not only such persons in the world as amateur photographers, but that now-a-days there is scarcely a man who travels who has not a photographic kit stowed away somewhere in his luggage. The Council of the Society has therefore issued a request to all the Fellows to forward copies of any photographs they may have taken during their travels, to the map curator of the Society. Should the donor have purchased the photographs, he is desired to give the name and address of the photographer for reference. If this idea be well supported by the numerous travellers who belong to the Society, a valuable collection will be accumulated.

Epping Forest is becoming one of the happy hunting grounds of the amateur photographer. A stroll through its woodland glades the other day revealed the fact that not one, but dozens, had selected the place for photographic study. Somebody recently complained that when setting up his camera he was stopped by one of the keepers, but surely this must be a mistake. The only explanation possible is that the amateur intended to photograph a group of friends, and that the keeper mistook him for one of the peripatetic professionals who, we presume, either pay for the privilege of making a living out of the visitors, or have a licence from the Common Council.

The occupation of the peripatetic photographer, by the way, must have been seriously interfered with by the amateur. Save on such places as Hampstead Heath, Epping Forest, and Clapham Common on popular holidays, he cannot have much to do. Even among the working classes cameras are becoming common enough, and in hosts of little suburban back gardens on Sundays they may be seen at work.

THE ROYAL ACADEMY OF ARTS, 1890.

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

GALLERY No. 3.—No. 186 ("Onwards," Sir John Gilbert, R.A). Our first feeling is that the frame is too small for the picture, and that the horse will shatter the whole thing to atoms, and dash out the brains of the unfortunate rider. No one can say that there is not plenty of "go" here.

In No. 190 ("Departing Day," Peter Graham, R.A.) we miss the cattle, and feel the rose-red mountain crowns are what the street-hawkers describe as "'ighly coloured"; but, in spite of the vivid tint, the scene is a beautiful one.

No. 195 ("A Smithy," W. C. Symons). This is coming nearer home—*i.e.*, nearer the photographer's pasturage—and is well worth careful examination, both for pose, arrangement, tint, and tone. The *realities* of life are the *natural* food for the camera.

Two pictures by Walter J. Shaw, No. 200 ("Off Bolt Head"), and 206 ("A November Day"), are such grey and green seas as have been seen (and tried for) on many a focussing screen.

The large and central picture of this end, No. 203 ("Redemption of Tannhäuser," Frank Dicksee, A.), the work of an Associate, put in this place of honour for the first time, speaks for itself. It is almost superfluous to say that it is altogether a masterpiece. Note the earnest expressions of the youthful acolytes; the central massing and grouping of the "whites," and of the "blacks," at side; the sacerdotal, inflexible dignity of the priest—movement of the messenger bringing the symbol of absolution; sympathy of the pilgrim band; the emotion in that *one* hand of the utterly broken Tannhäuser; the unity throughout, and general convergence towards the leading theme; breadth of treatment, and warm glow of declining day. All go to befit it for its place of honour.

There are two portrait studies near here, pointing a lesson to the portrait photographer—Nos. 204 (by James Sant, R.A.) and 211 (by H. T. Wells, R.A). Note carefully the open lips. There are very few people who can keep their mouth shut, either literally or metaphorically; fewer still who can do this gracefully; and still fewer when before the lens, especially when *told* to "close the lips and look cheerful." Therefore, do not make everyone close his lips when before the lens, if he seldom or ever closes them away from that cannon's mouth.

In portraiture, note again No. 212 (by E. J. Poynter, R.A.), how a lovely face may be detracted from by a distressing background.

No. 215 ("Low Tide," Peter Graham, R.A.) pleases one more by his figures and the bit of rock they are on, than the rest of that picture.

In No. 224 ("Rus in Urbe," Briton Riviere, R.A.) we take to the "collie" rather than to the boy; and again, in No. 225 ("The Anxious Look-Out," Thomas Faed, R.A.), the faces are not to our liking—quite.

No. 234 ("Thames, Dorchester," Vicat Cole, R.A). Here is some fine cloud drawing, and the "swirl" of the eddying waters is good to look upon, but the trees—a larger stop . . .!

No. 235 ("Portraits," W. O. Orchardson, R.A.) contains many a hint to the taker of groups.

Let us now consider together: No. 241 ("Outward Bound"), No. 248 ("Stand by"), and No. 76 ("All hands shorten sail," in room 1, all by Frank Brangwyn). No need to refer to catalogue to know that these three are off the same palette; almost monochrome—in cool tint and low in tone—broad, and simply, relying on drawing with true values, and lo! the picture grows. In No. 76, that unruly bucket, rolling from the lurch of the ship, seems somewhat "too sharp" to give a satisfactory idea of its erratic motion; possibly its entire omission might have been an advantage. This is a debatable point, of course; but, anyhow, the residuum of success goes far to support the dictum frequently attributed to Turner, viz., "it is the *greys* which make the picture."

Now look below at No. 243 ("Bath of Psyche," by Sir F. Leighton, P.R.A.), call to mind No. 166, and see opposite, No. 310 ("The Tragic Poetess"), by the same master, and each in their severe, yet befitting classic frame-surroundings. Psyche, the beloved of Eros (Cupid), and rival of Aphrodite (Venus), the personification of the human soul purified by passion and misfortune, and so prepared for perfect purity and happiness; the Dawn in search of the life-giving sun, &c. One needs such exquisitely beautiful manifestations as these to enable the ordinary mind to participate in the rich, boundless imagery of ancient Greece. Such creatures—*i.e.*, creations as these—we at once feel are not made of ordinary human clay. Nor are they, I take it, ever intended to be looked upon in that light. Art is as manifold, not only as nature herself, but also as many sided as the creatures which a cultured imagination can conceive, or create, upon a basis of idealised nature. And, although just for the moment it is not easy to fully grasp the foreshortening of the left arm of the Tragic Poetess, nevertheless the creation, idealisation of her care-burdened beauty, the inexorable sweetness of the face, gives one a fuller meaning to the conception, *Nemesis*. The deities of classic times were a reality then, such as but few can now realise, and those few alone can reveal them to us. Each of the three pictures helps one to realise that poetry is not for the ear alone. That they are not to be thought of as made of human clay, one has but to glance to the next frame, No. 249 ("A Jib for the New Smack," J. C. Hook, R.A.), where the hardy toilers of the deep are further hardened by their toil.

In No. 258 ("The Terrace," G. D. Leslie, R.A.), one's sympathy goes out towards the young lady, who, with justice, might repudiate being so utterly ignored in the title, and, as a matter of arrangement, we should have preferred the basket of flowers being almost anywhere else rather than where it is

No. 266 ("Brixham Trawlers," C. Stoney) is an old and familiar, beloved and valued, photographic friend.

No. 270 ("The Sculptor," J. B. Burgess, R.A.) is a fine work. The sculptor is the sort of man who lives for his art, and yet is not unworthy of the loving adoration of his wife. The "Church militant" called in to pass opinion on "the clay" evidently feels *his* responsibility concerning Pia Mater, Alma Mater. Note the echo of the theme, the repetition, re-duplication of the mother and child "in the flesh," as well as "in the clay," the picture on the wall, the subdued background and surroundings, contrast of the old and the young, the relief of contrast in darks and lights, general unity throughout, and the harmony of tint and tone. Altogether, a picture to study and learn much from.

No. 271 ("Loch Katrine," J. MacWhirter, A). An instructive study for the camera-man; shows the value of a subordinate figure. Note its position, relative size, and balance, the simple scale, and soft warmth of colour.

* Continued from page 374.

Also, in No. 279 ("Old Sherwood") by the same artist. Again, note the broad and simple treatment, true in tone and warmth of the after-glow; how the grouping of the bits of "life" all lead up to "that bold captain of a fearless band."

In No. 285 ("Highland Tramp Crossing a Headland," Thomas Faed, R.A.), although there is a feeling of the frame being too small for the size of the figures, and rather cramping their space to move in, yet the man's face is just simply *grand*—a bit of real life—a face with a history behind it, and worth all the rest of the picture put together.

No. 296 (Portrait, F. Goodall, R.A.), with a plain background of a rather unusual tint, which tells well against the face, and also the black and rose-coloured silk; and yet, possibly, it might have been still better had the green been of a somewhat lower tone; perhaps the hands are not quite satisfactory, but certainly the balance of the head is admirable.

No. 294 ("By the Committee Boat," W. H. Bartlett). Boys about to start for swimming race. The variation of pose is noteworthy, but we do not ever remember seeing boys (or men) racing in bathing caps.

No. 311 ("Grey Day at Newlyn," Anna Nordgren). We should very much like to have seen this picture put in a more see-able position. It is undoubtedly a carefully wrought work, in cool, low tone, nothing "painty" or shrill, but ably carrying out the feeling of a grey day: calm, sombre, quiet.

In No. 318 (Portrait), Professor Herkomer shows us his well-known skill in portraiture, and, in No. 319 ("Poverty and Progress," A. H. Y. Titcomb), shows the power of "reality" treated with simplicity, truth, and breadth, the "common-place" conveying true pathos. The world is full enough of *subject*; it only wants *seeing*.

No. 324 ("Frigidarium," L. Alma-Tadema, R.A). The interior of a Roman bath, where, at the time represented, it was customary to begin with a Calidarium (hot bath) or Tepidarium (tepid), and take the Frigidarium (cold) afterwards. The cold bath was in great repute after Antonius Musa recovered Augustus from a dangerous disease by the use of it, but fell into discredit after the death of Marcellus, which was attributed to the injudicious use of this remedy. Of course the marble and draperies are all that this painter has taught us to expect, yet, nevertheless, we have seen several of his larger works which have pleased us much more.

Of the two diploma pictures, No. 337 ("Freedom of the Press," J. B. Burgess, R.A.), and No. 338 ("On the North Foreland, W. O. Orchardson, R.A.), the "censors of the press" will probably appeal most strongly to the photographic instinct. Several notes may here be made—in pose, general arrangement of subject, and chiaroscuro.

In No. 328 ("Garden Flowers," Marcus Stone, R.A.), the garden steps and girlish beauty call to mind similar pictures (and backgrounds), yet the youthful grace of the figure, the flower of the "posie," is restful for the eye to dwell upon. The title, "The world went very well" (No. 302, by John Pettie, R.A.) calls up "All in a garden fair."

While at this end of the room, take a distant view of two large portrait studies—No. 269 (C. Calthrop), and No. 292 (P. R. Morris, A.R.A). Both bring to mind the effect produced by using a too short focus lens—not "(wide-angle)-wisely, but too well"—(revised edition). Is this effect contributed to by being hung aloft?

PHOTOGRAPHIC LENSES.*

BY THOMAS R. DALLMEYER.

FROM the general formula deduced from the three investigations above, applied to a case to find the distance of the diaphragm and the radii of the surfaces most favourable to the formation of a distinct image, it is found that it is

not possible to form an image perfectly distinct on a plane, although a distinct image can be formed on a curved spherical surface, the curvature of which is dependent on the refractive index and the focal length; in fact, its radius is μ F.

In these two cases (shown on black board), the diaphragm in one case is situated behind the lens at a distance

$$\frac{\mu - 1}{\mu^2 + \mu + 1} f.$$

Radius $R = \frac{\mu - 1}{\mu^2} f.$ Radius $S = -\frac{1}{\mu - 1} f.$

The other case is in the plano-convex lens, where the distance of the diaphragm

$$= \frac{\mu - 1}{\mu} f$$

$$r = \infty$$

$$s = (\mu - 1) f.$$

And as the curvature of field is dependent on μ, the higher the refractive index, the less curved will the field become. The effect of the diaphragm has a most important bearing on astigmatism, curvature of field, and distortion. In connection with astigmatism, the use of the diaphragm is the only means, in a single lens or system of lenses, of diminishing it if it should exist. On curvature of field and distortion it acts in exactly opposite directions in single lenses or single cemented combinations of more than one lens.

Take the case of the plano-convex lens above with a small diaphragm in contact. The curvature of field here will be very considerable, but the distortion practically *nil*. Now the further the diaphragm is removed from the lens the greater becomes the distortion, but the less the curvature.

It will be seen that by limiting the aperture the image-forming rays for each small pencil are closer together, and are not interfered with by those that have shorter foci, and would meet the lens at far greater refracting angles if the full aperture were employed. The further the diaphragm is removed, the flatter does the field become, but more distortion is introduced.

(*d.*) Distortion. The usual and simplest manner to describe this is to find the appearance after refraction of a square grating when the diaphragm, supposed small, is placed in front of the lens, and the field "flat" or cured of curvature. Where the refracting angle is greatest, viz., furthest away from the axis, the pencils are more refracted towards the axis than they are as they approach the axis, the axis itself suffering no displacement. The single rays of course may be taken as the axes of pencils. You

* Continued from p. 372.

will thus see that the pencils representing the lines become convergent towards the axis. This distortion is known as "barrel-shape" distortion. The opposite distortion, called pin-cushion, occurs if the diaphragm be placed behind the lens. The "barrel-shape" distortion is generally considered the less disagreeable of the two, and hence the diaphragm is usually placed in front of the single lenses.

Being now familiar with the effects of spherical aberration as produced by single lenses, and the general principles adopted to eliminate these errors, we will proceed to investigate how combinations of lenses may still further and better tend to annihilate the errors of form.

The various applications of lenses to different purposes will indicate the most appropriate directions in which to work to accomplish this. For very rapid lenses, such as are used in portraiture, it is necessary to pay strict attention to the aplanatism of the central pencil, and choosing such forms as are best suited to eliminate curvature of field, astigmatism, and distortion, but these latter are made subservient, in the main, to those of rapidity. When, however, aperture may be sacrificed, we are enabled to lay greater stress on the three latter considerations, but in every case the skill of the optician consists in the best compromise among the effects of aberration.

We have seen that a single glass lens can neither be achromatic nor aplanatic for parallel rays, but we have found that a single lens can be made achromatic by combining it with another lens of different dispersive power; the condition for axial achromatism being merely one of the correct relation between the focal length of the lenses or their powers. Let us now examine the condition for aplanatism by combination with another lens.

In the first approximation combining two lenses we have—

$$\frac{1}{v_1} = \frac{1}{f_1} - \frac{1}{u}$$
$$\frac{1}{v_2} = \frac{1}{f_2} + \frac{1}{v_1}$$
$$= \frac{1}{f_1} + \frac{1}{f_2} - \frac{1}{u}$$

so that if the lenses are in contact, the effect is the same as one lens equal to the *algebraical sum* of the *powers* of each; if the second lens was negative, for example, we should get—

$$\frac{1}{v_2} = \frac{1}{f_1} - \frac{1}{f_2} - \frac{1}{u};$$

and with any number lenses—

$$\frac{1}{v_n} = \frac{1}{f_1} + \frac{1}{f_2} + \ldots + \frac{1}{fu} - \frac{1}{u}.$$

We have found a second approximation for a single lens showing the aberration, and for our purposes here this may be put under a more convenient form.

Since $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$, and $\frac{1}{r} + \frac{1}{s} = \frac{1}{\mu - 1}\frac{1}{f}$;

Let $\frac{1}{u} = \frac{1}{2f}(1 + a)$, $\frac{1}{r} = \frac{1}{2(\mu - 1)f}(1 + x)$,

$\frac{1}{v} = \frac{1}{2f}(1 - a)$, $\frac{1}{s} = \frac{1}{2(\mu - 1)f}(1 - x)$,

If we then find the values of

$$\left\{\frac{1}{r} + \frac{1}{u}\right\}^2 \text{ and } \left\{\frac{1}{s} + \frac{1}{v}\right\}^2$$

we obtain the second approximation in a more convenient form after the necessary reductions, viz.:—

We have at the first lens,

$$\frac{1}{v_1} = \frac{1}{f} - \frac{1}{u} + \frac{1}{\mu(\mu - 1)}\left\{\frac{\mu + 2}{\mu - 1}x^2 + 4(\mu + 1)ax + (3\mu + 2)(\mu - 1)a^2 + \frac{\mu^3}{\mu - 1}\right\}\frac{y^2}{8f^3}$$

This may be written

$$\frac{1}{v_1} = \frac{1}{f_1} - \frac{1}{u} + \omega_1 y^2,$$

and on passing to the second lens

$$\frac{1}{v_2} = \frac{1}{f} - \frac{1}{u} + \omega_1 y^2$$
$$= \frac{1}{f_1} + \frac{1}{f_2} - \frac{1}{u} + (\omega_1 + \omega_2)y^2$$

and in general—

$$\frac{1}{v_2} = \frac{1}{f_1} + \frac{1}{f_2} + \frac{1}{f_3} + \ldots \frac{1}{f_n} - \frac{1}{u} + (\omega_1 + \omega_2 + \ldots \omega_n)y^2.$$

The object then for aplanatism is to make

$$\Sigma\, \omega = 0.$$

Now this can always be done by assuming a definite ratio between the radii of one lens and finding the ratio between the radii of the second that shall destroy the first aberration.

Now if we call r_1 s_1 the radii of the first lens, and r_2 s_2 the radii of the second lens, and take a form of aplanatic combination, such as the rapid rectilinear, in which both front and back combinations are identical with cemented and identical contracts.

Here s_1 and r_2 are identical except in sign, and if the glasses chosen are suited, there is only one form for the best correction for spherical aberration. The ratio of the powers is a constant, and therefore by a proper substitution in the above equations, this construction becomes a simple matter. The question evolves itself into a simple quadratic, one root of which is usually imaginary. Should both be imaginary, the glasses are unsuited to the purpose, and a symmetrical system cannot obtain.

The front combination alone, with its convexity towards the object for the oblique pencils, has a powerful coma-*in*, and the back combination alone, with its concavity outward, a powerful coma-*out*. The two in the combination have the effect of counterbalancing one another, more or less, according to the selection of suitable material; the residuum effect of aberration for the oblique pencils being visible as astigmatism or curvature of field, but distortion is destroyed. A proper selection of the new glasses certainly enables improvements in both these respects with larger apertures than was formerly possible.

For the elucidation of the possibilities of producing combinations of large aperture suited to portrait work, at a period, too, when rapidity was of the utmost importance, we owe a great debt of gratitude to the prince of mathematical opticians, Professor Petzval. His portrait combination, known to you all, was a triumph, and the result of pure analytical investigation. He proved to working opticians the possibilities of vast improvements in the instruments then made, and also confirmed them in many of their geometrical and practical deductions.

For your interest I have made a drawing, tracing the course of the rays through a Petzval combination for the oblique as well as the central pencil, and it serves to show how perfectly the mathematical elegance—perhaps I should say labour—brought to bear on this subject corresponds with the general principles then known and

worked upon for the best relation to exist between the incidence and emergence of the various pencils to form a distinct image.

I think I may be allowed to mention here, with pardonable pride, my late father's improvements in lenses generally since that period, and particularly with respect to his portrait combination. It was a great advance on that of Petzval, not only for greater covering power, but for strict mathematical capabilities. You are well aware that a lens that is free from spherical aberration for parallel rays is not so for nearer objects, but becomes what is called over-corrected for spherical aberration. Now, in addition to better optical perfection, the form of the back combination, by a mechanical contrivance of separating the back flint from the crown, will correct or counterbalance the over-correction for nearer objects if necessary, or may, on the other hand, be so far removed as to introduce, according to taste, a considerable amount of positive spherical aberration, that was first asked for by the late Mr. T. R. Williams, to soften the biting sharpness of lenses when required to produce more artistic results.

In slower lenses, where rapidity is sacrificed, a judicious selection of the powers of the elements in the combination or combinations, and arranging their curvature so that, as in the case of achromatism, the pencils at incidence and emergence are similarly treated for every part of the lens, so do we arrive at better perfection of the image, until the maintenance is so perfect that it becomes a parallel with an imaginary pinhole (without diffraction), the aperture or intensity being as great as possible consistent with this perfection.

To conclude, as photography for utilitarian purposes in the sciences and commerce require our lenses to attain the highest mathematical precision, no less does art—and photography is rapidly gaining ground as an art—require the optician to handle the subject in an equally intelligent manner, to give to those instruments wider capabilities.

Photographic Society of Great Britain.—Technical meeting, Tuesday, May 27th, at 8 p.m., 5A, Pall Mall East, when "Stereoscopic Work" will be discussed.

Colonel Stuart Wortley.—We regret to have to announce the death of Colonel Stuart Wortley, who occupied a leading place in London photographic circles some years ago. His large landscape photographs and his sea views, in which the camera often faced the sun, were many of them of a highly artistic character. Not long since he went on a voyage round the world for the benefit of his health.

A Varnish Vehicle in Painting.—In a circular issued by the Aston Chemical Company of Birmingham, it is stated that an article in the *Daily Telegraph* has said:—"The late Frank Holl used as a vehicle, amber varnish, diluted may be with a little nut or purified linseed oil, to make it run more freely, and though amber varnish is found difficult to work with, it has proved to be the only durable preparation of its kind extant. Mr. Herkomer, Mr. Sant, Mr. William Hughes, and other prominent painters 'swear by amber varnish,' and the freshness of their productions of several years ago sufficiently testifies to the merits of that valuable vehicle." The circular adds that the one great drawback to the use of a varnish vehicle in painting is its rapid drying quality, causing the brush to drag, and preventing its being worked freely; and again, if an oil be mixed with amber varnish, the incorporation of the two is not complete enough to form a reliable stable mixture. Mr. Standage has overcome both these drawbacks; his medium is neither a varnish nor a simple oil, but a peculiar combination of the purest linseed oil with the finest quality of carefully hand-picked amber. No other ingredient whatever enters into its composition.

THE ROYAL INSTITUTION.

Professor Meldola on "The Invisible Photographic Image."

Last Friday night Professor R. Meldola delivered a lecture at the Royal Institution upon "The Invisible Photographic Image." Dr. Edward Frankland, F.R.S., presided. Among those present were Captain W. de W. Abney, Professor Alexander Herschel, Mr. Paul Waterlow, Mr. Geddes, Mr. J. W. Swan, Mr. H. Trueman Wood, Lord Rayleigh, Mr. C. V. Boys, Mr. Walter Coffin, Professor Dewar, Professor Hughes, Mr. F. Goldby, Dr. J. H. Gladstone, Mr. Shelford Bidwell, and Dr. James Edmunds.

Professor Meldola began by giving an outline of the history of photography, beginning with the photographic design produced by Schultze in 1727. The next step was the considerable advance made by Wedgwood, and first made known at the Royal Institution, of spreading the sensitive compound over a surface instead of using it in mass; this was done in 1802. He told how Fox Talbot, in 1835, produced photographs on paper by means of chloride of silver, and how later on some of these photographs were brought under the notice of the Institution by Faraday. Sir John Herschel coated glass with chloride of silver by subsidence, and one of his early photographs produced in that way was exhibited. The discoveries of Niépce de Chalons and Daguerre were described, and their likenesses, together with that of Fox Talbot, were projected on the screen by means of the electric lantern. As to Dr. Thomas Young's photograph of Newton's rings, taken in 1803, Professor Dewar by search had found on the premises what was believed to be the appliance made by him for producing the rings, and, as they could see, some of the rings were distinctly visible. The lecturer spoke of the discovery of the action of light on bichromate of potash by Mungo Ponton, then entered into historical details of later date.

The speaker pointed out how silver chloride becomes discoloured under the action of light and at the same time gives off chlorine, or, under some circumstances, hypochlorous acid. Bromine acts in analagous manner under the action of light, and silver iodide does so only when a halogen absorbent is present. The amount of darkening produced has no relation to the relative sensitiveness of the three haloids; it only means that some of the products are more highly coloured than others. Evidently the action is one of photo-chemical decomposition, and is not a mechanical change. Substances which absorb the liberated halogen accelerate the decomposition; oxidising substances act as retarding agents. Captain Abney has made this his own special subject, and it is evident that a ray of light falling on a silver haloid is doing chemical work. The chemical nature of the coloured product resulting from decomposition by light is still shrouded in mystery; all that is known is, that it contains less of the halogen; it is never formed except as a mere trace, mixed with a relatively vast mass of unaltered haloid. Carey Lea has called such products photo-salts, meaning thereby a combination of each dark product with unchanged haloid. He (Professor Meldola) thought that the free metal theory of the deposit hardly holds good, because chloride of silver will darken in the light under strong nitric acid, and the latter acid would dissolve the dark product if it were silver. The sub-haloid theory may be true, but still it has not been established in such a way as the chemist has the right to demand.

The oxychloride theory is also without vigorous proof. He had put most carefully dried silver chloride under dried liquid hydrocarbons, and in every instance it had darkened under the action of light; such results, however, merely raise the question, what are the kinds of products due to the medium in which the decomposition takes place? When chloride of silver darkens under water, an oxychloride may be formed.

Mr. Carey Lea has recently formed some beautifully coloured compounds of silver, which he thinks to be identical with those which form the photographic image. In 1859, a committee of the British Association described something of the same kind, and how to form red silver chloride.

The invisible photographic image is now formed in a minute fraction of a second, but there is good reason to believe that it is analagous in composition to the photo-salt, although it would be premature to say that it is the same. It was at one time held that the invisible image is due to a molecular and not a chemical change, an idea which he believed to still survive. Reducing and oxidising agents act in the same way upon the visible and upon the invisible image, and halogen absorbents make modern films more sensitive still, which facts tend to show that the image is of the same nature in both cases.

Carey Lea, Eder, and Abney have shown that mechanical pressure will produce the same effect upon a sensitive film as that which is produced by light, but a halogen absorbent must be present; and, if the result of the action of stress or light were merely mechanical, he could not see the necessity for the presence of the halogen absorbent. That this absorbent must be present is a fact strongly in favour of the chemical theory of the invisible image. The experiments of Mr. Spring, of Liége, show that in some instances when great pressure is brought to bear upon certain dry salts, chemical reactions are set up; something of the same kind seems to take place when light acts upon a silver haloid. In conclusion, he thought that the scientific foundations of the problem of the nature of the invisible image must be laid by the chemist; but the problem is a difficult one, because the photo-salts of Lea are not of such a definite nature as those with which the chemist is in the habit of dealing.

We postpone a criticism of this lecture until the full text has been published.

North Middlesex Photographic Club.—An outing of this Club will take place on Monday, May 26th; the members will meet at Paddington Station at 10 a.m., and proceed to Cookham and work to Maidenhead. Friends and visitors are invited to join.

The Late Mr. W. H. Geddes. — In the course of an obituary notice the *Arbroath Guide* says:—"Mr Geddes is best known from his connection with photography in Arbroath, and in that connection he is known far and wide. He was the oldest photographer in the town, and indeed it was his brother Thomas who introduced the art into Arbroath. Mr. Thomas Geddes had his joinery shop in North Grimsby, and somewhere about the year 1848, while continuing to carry on that business, he opened a photographic studio in High Street. At that time the Daguerrotype was the common form of photography, but shortly after starting the business Mr. Geddes began to take portraits on glass, and he continued long enough in practice in Arbroath to introduce also the taking of photographs on prepared paper as at present. In 1851 Mr. Thomas Geddes emigrated to Australia, and his brother William took up the photographer's business, doing good work. Since then the business has been much developed by his son, who will carry it on under the same title as before.

FICTION IN PHOTOGRAPHY.

The story of a Strange Sitter, also told by an American of Americans, has a wholly unexpected finale, and so possesses one of the most interesting features in historical narrative—that, namely, of surprise. It is Christmas Eve; the hour is within a few minutes of midnight; outside the closely-fastened shutters the wind is howling, driving the blinding snow into the eyes of a few solitary wayfarers who are luckless enough to be out of doors at such a season and at such a time. The photographer's little parlour is rendered still more cosy by the charms of contrast. All is comfortable here. Cigars are lighted, fresh glasses of toddy, with the due quantum of lemon peel, are supplied; chairs are drawn closer round the roaring fire—the matter of drawing closer of chairs is *de rigueur*—and the American artist and host begins his tale, a long one, of which the following is a short summary.

I lived at that time, says the narrator, next door to a boarding house, which supplied me with frequent customers. One afternoon, about a week before Christmas, a certain Captain Adolphus Smith called to have his portrait taken. He was a remarkably handsome man, "clustering curls waved round his chiselled brow," and so on. He was also very particular about the appearance of his necktie. Two days after his visit, while I was working at his portrait, I was started by a voice immediately behind my chair. I turned and saw a young girl of a pale ghastly appearance, dressed entirely in white, with a single red rose in her bosom. "I wish," she said, "for a carte-de-visite, to be given, when finished, to Captain Smith." In a state of extreme excitement, I took the necessary negative without the slightest trouble. The girl remained motionless, and in a good position. When I returned with the plate she was gone, and I should have thought the whole matter a dream, had there not been a material greenback, which was not there before, lying on my table. In due time I gave the Captain his own portrait and that of the mysterious young woman. "What!" he cried, in a voice hoarse and almost inarticulate with rage, "what is this?" and fell to the floor in a fainting fit. It was afterwards explained to me that the portrait was that of a Miss Susan Robinson, who had fallen in love with the Captain, had been treated by him with much unkindness after kindness; had received, in short, her *coup de grace* from the Captain's cruelty, and had died some twelve months before she appeared in my studio. So far, says the photographer, it seems evident that I had taken the photograph of a ghost; but there is more to come. Some months afterwards, a lady from the boarding-house chanced, in looking at my scrap-book, to light upon the portrait of my strange sitter. "Ah!" she said, "I see you have taken Miss Sarah Robinson." "Pardon me," said I, "Susan." "No, no, Sarah," replied the lady; "Susan died over a year ago. This is the portrait of her twin sister, who was staying in our boarding-house last Christmas." I then learnt, says the photographer, that Miss Sarah was subject to epilepsy, and had been treated with nitrate of silver, which, lodging in the tissues of her skin, had imparted to it a permanent livid colour, fully accounting for my spectral sitter's ghastly appearance. She had probably seen the Captain enter my studio, and being acquainted with the whole story of her sister's unhappy love, had determined to give that gay soldier a lesson. Not, I fear, to any good purpose, concludes

* Continued from page 337.

the story teller, since the last I heard of him was that he was one of the most notorious male flirts in New York.

Another story of several pages professes to show what may be done by a photograph. "Only a Photograph," is the title, but from a photograph arises—not probably for the first or the last time—a wedding. The reader is introduced to the Picture Gallery at Antwerp, where a visitor, Mr. Brown, has received another man's hat in exchange for his own, which he had left in the charge of the proper official. Now, Mr. Brown's hat had the distinction of holding a lady's photograph fastened to the top lining. The gentleman who has received this hat for his own sees the picture, becomes enamoured of the shadow, and seeks the substance. For some time his efforts are fruitless. The tale gives an amusing description of his obtaining, after much toil, an introduction to a lady who, alas! though similar to his ideal, differs from it on a nearer view in some important particulars. After numerous difficulties, upon which the story dilates at large, he meets with the object of his aspiration, tells her all about the photograph, without showing it to her, and asks her advice on the subject. The lady, who loves him at first sight, finds her position a hard one. She is unwilling to assist him in discovering the girl who, she naturally supposes, is her rival. That, indeed, would be in her opinion, crowding the mourners. No: she declines to advise him. "Will you, then, see the picture?" asks the lover. "That would not be right," replies the unconscious beloved. However, being a woman—and so not entirely devoid of curiosity—she at last consents to look at it. A handsome case is handed to her, which she opens, and discovers her own portrait. The conclusion, so far as these two are concerned, may be confidently left to the reader's imagination. Only one difficulty remains for after-consideration. How did this lady's photograph find its way to the hat of the gentleman who visited the Picture Gallery at Antwerp? Mr. Brown had a sister, a friend of this lady, and the owner of her photograph. When Mr. Brown left his sister for Antwerp, she, wishing to remind him of her, pinned, on the night he left, what she thought was her own picture, in his hat. The picture was really that of her friend. And this little mistake of Miss Brown's was the cause of the marriage. Nor must the photographer be forgotten, for had the portrait been a bad one, that marriage would probably never have taken place.

In the next tale, a photograph, so far from producing a marriage, nearly produces a divorce. The interest of this story of a tragi-comic character turns on an error in a number affixed to a negative. It is told by a rising photographer, who begins by numbering his negatives as people sometimes number their cheques—with thousands for units. The dramatis personæ are a young man with an old and jealous wife, and a middle-aged friend who has formerly been a suitor for her hand. The old lady, of course, has money. One day this former suitor comes to bid her farewell. He is compelled, he says, in a sad and mysterious tone, to leave England for ever. The old lady receives this intimation with calm composure. "You are one of my husband's most intimate friends," she observes: "can you tell me anything about him—I mean as to what he does when away from me—before you go?" "Nothing," he replies; "yet stay! last Wednesday he visited a photographer's with me. Go to that photographer's and ask for No. 99,999. When you obtain the unfortunate's portrait, it will explain all"; and without a word more he was gone. The unfortunate! Horror-struck, the wife, already in her imagination abandoned, visits the photographer who tells the story—the photographer indicated by her former suitor—and asks for the fatal number. She receives it, utters a shriek, and faints. The husband returns home unsuspicious to his meat tea. The kettle is boiling on the hob, the cat lies in her accustomed place on the hearth-rug, but his wife—ah! his wife—has become a fury. "Look," she cries with vindictive emphasis, "at this," and thrusts No. 99,999 before his astonished eyes. "Well," says her husband, "what of it?" It is a pretty face, in a dress very fashionable and very low cut. "It is," says the wife, "a brazen hussy, and you ought to be ashamed of yourself." "Why on earth should I?" asks the innocent husband; "I never saw the woman in my life." "Oh, the perfidy of mankind!" she groans in reply, and threatens the divorce court. At this juncture the former suitor comes in radiant. He learns what is the matter, and asks to see No. 99,999. "Good gracious!" he exclaims, "here is some mistake. No. 99,999 is the number of my own portrait, and it has been affixed to the portrait of—well, somebody else." "Your sister," he continues, turning to the lady, "had refused me, I had determined to leave for America, and I was anxious to let you have my own portrait which I had taken for her. However, she and I have made it all up now, and you must do the same." "The mistake," says the photographer, "was owing to the negligence of a careless boy, whom I was unwise enough to employ as a clerk. It very nearly made me a witness in proceedings in the Divorce Court.

(*To be continued*).

PHOTOGRAPHIC MOUNTS.

The *Liverpool Daily Courier* of Saturday and Monday last contains a report of a case which came before Mr. Justice Lawrence and a special jury at the Nisi Prius Court, Liverpool spring assizes.

The *Courier* of Monday last says:—"This was a part heard action by Aaron Vandyke, photographer, Bold Street, to recover damages for breach of contract from Marion and Co., wholesale dealers in fancy and photographic goods, London and Paris. Mr. J. C. Bigham, Q.C., with Mr. T. S. Little (instructed by Mr. Walter H. Cowl), appeared for the plaintiff; and Mr. W. R. Kennedy, Q.C., with Mr. Pickford (instructed by Mr. Henry White, of London), for the defendants. The plaintiff purchased from the defendants, about the end of 1886, 50,000 enamelled cabinet mounts, which were alleged to be defective, photographs mounted on them exhibiting signs of streakiness after the lapse of a few months. This, the plaintiff contended, was due to the presence in the mounts of hyposulphites, caused by insufficient washing during the process of manufacture. On the other hand, the defence was that the streaks in the photographs were to be attributed to lactic acid, produced by fermentation of the germs in the solution of starch used by the plaintiff in mounting the photographs. Further evidence was given for the defendants, among the witnesses examined being Mr. Thomas Bolas, F.C.S., Mr. Frank Bishop, a partner in the firm of Marion and Co., Mr. Cowan, photographic specialist, Mr. George Taylor, Mr. W. Downey, and Mr. Mowll, photographers. After considering their verdict for three-quarters of an hour, the jury returned into court, the foreman announcing that there was no possibility of their agreeing. His Lordship, however, said they must make another effort to arrive at a definite decision. In reply to the jury the plaintiff expressed his willingness to take the verdict of the majority, but to this the defendants refused to assent. The jury again retired, but as after two hours' further deliberation they were unable to agree, they were discharged."

Patent Intelligence.

Applications for Letters Patent.

6,607. F. Taylor, 4, Corporation Street, Manchester. "Photographic Printing Frames."—April 30.

6,825. J. Parkinson, S. Fawcett, and C. F. Parkinson, South Regent Street, Lancaster. "Registering Apparatus for Photographic Exposures."—May 3.

6,861. G. Prescott, 99, Hatton Garden, London. "Stereoscopic Slides."—May 3.

6,984. H. Silbergleit, 4, Corporation Street, Manchester. "Apparatus for Developing and Fixing Photographic Negatives."—May 6.

7,010. B. J. B. Mills, 23, Southampton Buildings, London. "Cameras." (Louis Lumière, Montplaisir.)—May 6.

7,066. W. G. Tweedy, 8, Athenæum Terrace, Plymouth. "Actuating Photographic Shutters."—May 7.

7,150. J. B. Brooks, 6, Livery Street, Birmingham. "Camera Stands,"—May 8.

7,159. R. Mercer and A. J. Mercer, 128, Colmore Row, Birmingham. "Hand Cameras."—May 8.

7,248. H. R. Hume, 40, Rowan Road, Hammersmith, London. "Photographic Shutters."—May 9.

7,296. C. D. Ahrens, Tudor Road, Norbiton, Surrey. "Apparatus for the Polarisation of Light."—May 10.

7,411. H. M. Hastings, 54, Edith Road, West Kensington, London. "Light-tight Developing Dish."—May 13.

7,420. A. Coke, 2, Guldney Road, Clifton. "Photometer."—May 13.

7,453. A. G. Green, C. F. Cross and E. J. Bevan. "A Process for Photographing by means of Organic Compounds."—May 13.

7,489. C. C. Vevers, 12, Market Street, Leeds. "Cameras."—May 14.

7,578. W. G. Thomson, 8, Quality Court, London. "Photographic Roller Holders."—May 15.

7,589. W. E. Gibb, 35 Southampton Buildings, London. "Apparatus for Producing Photographic Pictures."—May 15.

7,650. J. R. Gotz, 433, Strand, London. "Photographic Shutters."—May 16.

Specifications Published.

9,358. *June 5th*, 1889.—"The Production of Alloys of Aluminium." Robert Ellis Green, late of No. 41, Sandringham Road, Hackney, now of No. 5, St. John's Terrace, Southall, Merchant.

This invention relates to the production of alloys of aluminium with any other alloy-forming metal; its object is to produce such alloys, not by combining metallic aluminium, which has already been produced, with a metal, but directly by decomposing the fluorides of aluminium or the double fluorides of aluminium and potassium or sodium in the presence of the metal with which it is desired to form an alloy.

To illustrate the manner of carrying out the invention, I proceed to describe the details of the process when the object is to form an alloy of aluminium and iron.

I use a crucible or retort or any suitable furnace which will bear the heat at which iron becomes fused; at the lower part of the crucible or furnace I fix a tuyère or inlet pipe, connected to a supply of carburetted hydrogen or hydrogen gas. I place in the crucible or furnace iron, and fluoride of aluminium, or the double fluoride of aluminium, and sodium or potassium, and sometimes white sand (silica) or silicate of soda, or potash, or other compound of silicon if it be necessary; that is to say, that inasmuch as many qualities of iron contain silicon, I am guided by the amount of it that is contained in the iron which I am about to use. Thus, if the iron be free from silicon, and when desiring to produce an alloy of aluminium and iron which shall contain one per cent. of the former, to every 100 lbs. of such iron which I put into the crucible or furnace, I add 8 lbs. cryolite (double fluoride of aluminium and sodium), and 35 ounces silicate of soda, or 40 ounces silicate of potash, or 32 ounces silicon disulphide, or 26 ounces of white sand, and I lessen the quantity of silicon compound which must be placed in the crucible or furnace in proportion to the amount of silicon contained in the iron in accordance with the chemical combining proportion.

Having made these calculations and put the necessary quantities of each material into the crucible or furnace, and turned on the supply of gas through the tuyère, I gradually raise the temperature of the crucible or furnace till the whole contents have become fused. I keep up this heat for about thirty minutes, when the fluoride having decomposed, its aluminium is absorbed by the iron and the alloy formed, and is ready to be drawn off into moulds.

When forming alloys of aluminium with other metals I proceed in the same manner, and use the same materials, except that I substitute the other metal with which I wish to alloy the aluminium in place of the iron as above.

What I claim is:—

1st. The production of alloys of aluminium in the manner described.

2nd. The production of alloys of aluminium direct from the fluorides of aluminium, or the double fluorides of aluminium, and sodium or potassium, and silica, or compounds of silicon reacting upon each other in the presence of a metal.

10,594. *July 1st*, 1889.—"Shutters for Photographic Cameras." John Kershaw, 47, Spring Gardens, Buxton, Derbyshire, Photographer.

The improvements which are the subject of this invention relate to the means employed for closing the spring blind in the shutter of a photographic camera, and the object of this invention is to construct a shutter that may be used either as an instantaneous shutter or as a time shutter, when an interval of time for exposure is required in lieu of instantaneous exposure.

I construct a shutter in which is a spring blind with an aperture for exposure of light to the sensitive plate. By means of a gravitation lever in combination with a ratchet wheel on the end of liberating roller of spring blind, as described in the specification of my invention, for which letters patent for Great Britain were granted to me bearing date the 21st day of April, A.D. 1885, and numbered 5,014, the spring blind in the shutter may be closed instantaneously.

For the purpose of obtaining an interval of time for exposure when instantaneous exposure is not required, I employ a secondary lever of an angular shape in combination with the aforesaid gravitation lever. I suspend this secondary lever to a stud formed on a spring plate, which I attach to the side of the shutter in proximity to the gravitation lever. I form an angular slot or cam groove in this secondary lever, through which I pass a stud which is attached to the gravitation lever. On the end of the liberating roller of spring blind I attach a worm which, when the said liberating roller is revolved by the operator in order to wind the blind on, the said roller, preparatory to exposure, actuates a worm wheel affixed to the side of the shutter. I form this worm wheel with a hole in the face thereof, into which a stud attached to the aforesaid spring plate is caused to enter by the action of the spring plate, when the ratchet wheel is revolved and the before-mentioned hole comes opposite the stud in spring plate. I attach a pawl to the aforesaid spring plate, which engages with and prevents rotation of the ratchet wheel affixed to the end of the blind roller immediately the said stud enters the hole in the face of the worm wheel, but not at any other time.

When it is required to close the spring blind instantaneously, the herein-above-described secondary lever remains inactive, and the spring blind in the shutter is instantaneously closed by one compression of the air bulb which is attached to the pneumatic tube acting on the gravitation lever; but when it is preferred to obtain an interval of time for exposure, the said secondary lever, in which is a cam groove, is set at an angle which necessitates a second compression of the air bulb in order to close the blind or shutter, the first compression causing the blind to open and remain open until the second compression of the air bulb, which releases the pawl from the ratchet wheel by the return of secondary lever to its original position, and thus permits the spring blind to close.

To obviate concussion in checking the blind when the said blind is required to be kept open to obtain a longer exposure,

I place in the liberating roller a coil spring with a resistance which is insufficient to neutralise the action of the spring contained in the bottom or receiving roller for the blind, but is sufficient to prevent concussion.

When it is required to give more exposure to the foreground than to the sky, I cause the aperture in the blind to open from the bottom of the shutter by placing the coil spring in the receiving roller in the upper part of the shutter, by which means the blind is caused to pass from the liberating roller contained in the upper part of the shutter, over the tension roller at the bottom of the shutter, and, returning upwards, is wound on the receiving roller.

10,504. *June 28th*, 1889.—"Deciding the Correct Exposure in Platinotype Printing." CHARLES ROBERT CRAWFORD, 10, Monmouth Road, Bayswater, London, Gentleman.

I take a negative of a number or series of letters, or figures, or signs, and when this negative has been duly developed and properly treated for printing, I cover the first letter, or figure, or sign with one layer of fine tracing paper or other suitable material, and the second letter, or figure, or sign with two layers of paper or material, and the third letter, or figure, or sign with three layers of paper or material, and so on, providing as many letters, or figures, or signs as may be desired, and covering the same, if necessary, with glass, and under this negative so treated I place a piece of ordinary sensitised paper, enclosing the whole in a suitable printing frame. In the same frame, or in another by its side, I place the platinotype paper under its negative, which has also been properly treated, and I give these two prints the same exposure until the platinotype print has been correctly exposed, when I note the letter, or figure, or sign that is just visible in the first mentioned or deciding print. The next prints are arranged for and from both the negatives in the same way, and when the letter, or figure, or sign noted as above is again just visible in the deciding print, the correct exposure has again been given to the platinotype print, and in this manner all these platinotype prints will be exactly alike when they are finished off in the usual manner, care being taken that the bath is kept at about the same temperature. When the trial exposure has not been quite exactly correct, it will be easy to make a due allowance therefor, and note a letter, or figure, or sign before or behind that which is just visible as aforesaid.

9,403 *June 6th*, 1889.—"Apparatus for Copying by Photography." ARCHIBALD BARR, Professor of Engineering, and WILLIAM STROUD, Professor of Physics, both of the Yorkshire College, Leeds.

Our invention has reference to the copying by means of photography of pictures, drawings, book illustrations, and the like, more especially for cases in which it is desirable to have the reproductions or negatives of all one size, or restricted to a very few definite sizes. Now the object of our invention is to provide an apparatus by means of which such copying may be effected with ease, rapidity, and accuracy.

Such an apparatus should provide or consist of means, (1) for properly supporting the book or picture; and (2) for supporting the camera, and adjusting the same at the proper height and distance, and in the proper position with reference to the picture, and also for focussing the same. One of the most useful cases to which our invention may be applied is the production for lecture use of lantern slides of illustrations from books, and we shall describe our invention with reference to such use, as this, perhaps, best illustrates and ascertains the nature of our invention.

An apparatus constructed in accordance with our invention consists in the first place, of a holder or support for the book. Such holder may conveniently consist of a box-shaped frame, open at the front, and provided at the back with two sliding boards arranged so that they can be simultaneously and to an equal extent moved towards or from a central vertical line. The upper edges of the boards may be arranged to move in a narrow groove in the under side of the top board of the frame close to the back edge thereof. The lower edges of the sliding boards may be similarly fitted to slide in grooves in the bottom of the frame, or provided with lugs or bosses fitting on a tubular or plain slide or guide bar. The two sliding boards are so connected together that they are constrained to move simultaneously and to an equal extent towards or from the centre vertical line (in which their inner edges would meet if closed up). This may be effected by suitable link mechanism, but is perhaps most conveniently carried out by providing each sliding board at its lower end with a tapped or screwed boss or socket, fitting respectively on opposite (*i.e.*, the right and left hand) side portions of a quick pitched right and left handed screw. In this case a guide for the lower edges of the sliding boards as above mentioned is unnecessary. The book, opened to the page containing the illustration to be copied, is placed with this page against the back sliding boards, which have been opened the necessary distance so as to expose the illustration to be copied. The opposite page of the book is laid on the top board of the frame at the back thereof, and a pointer or index attached to one or other of the sliding boards facilitates the adjustment of the boards to give the proper opening, the size of which may have been previously ascertained by measurement from the illustration. A couple of Argand gas burners, or other source of light, placed one towards each side, and towards the front of the frame, supply the necessary illumination for the picture; the front of the frame being, of course, covered in so much at each side, as to exclude the direct light from the lens of the camera. Instead of using artificial light, the frame may be arranged and placed so as to expose the illustration to be copied in daylight.

The second part of our invention relates to the means for supporting, adjusting, and focussing the camera. The camera is supported by mechanism for adjusting it to the proper height (to be afterwards described) from a frame or carriage capable of being moved on a railway or longitudinal guide, so that the centre line of the camera may be moved to and fro in a direction at right angles to the back of the frame or book-holder, *i.e.*, to the illustration to be copied. An index or pointer attached to the carriage or frame, and a scale of equal parts fixed on the side of the railway or longitudinal guide, enables the camera to be at once adjusted at the proper distance from the book holder to produce a negative of the desired size.

The scale is most conveniently graduated and marked according to the longest dimension of the picture to be copied, so that when the camera is placed with the index opposite this division, the image of the picture in the camera will be of the desired effect.

The camera is supported from the carriage or frame by means of a parallel motion, so constructed as to keep the camera in a perfectly horizontal position both longitudinally and transversely, and preferably so as to constrain the camera to move in a vertical line, so that its up and down motion may not affect its distance from the book-holder. Such a parallel motion may consist of two pairs of hinged boards (or equivalent link connections), the angular or radial movement of the one pair being at right angles to the angular or radial movement of the other pair. Or the two pairs may be arranged with their angular or radial movements in the same sense or direction, in which case a vertical guide and a connecting board or rods joining the middle hinge is required in order to keep the camera perfectly horizontal in a longitudinal direction. The lower boards hinged to the carriage or frame may further be prolonged below the point or axes at which they are hinged to the frame or carriage, and carry a balance weight or weights to facilitate the raising and lowering of the camera; or a spring may be introduced so as to balance or partially balance the weight of the camera. Such spring may be conveniently introduced at the hinge connecting a pair of radial boards or frames. A pointer attached to the camera, and a vertical scale of equal parts fixed to the carriage or frame, facilitate the adjustment of the camera to the proper height, a scale of equal parts being also attached to the inner edge of one or both of the sliding boards of the book-holder, for reading off the requisite height of the camera. The movable or negative end of the camera is provided with a pointer or index, and the base of the camera with a scale of reciprocals for facilitating the focussing of the camera; the graduations and markings of

this scale being made to correspond with those of the scale indicating the distance of the camera from the book-holder. By the arrangement of scales described, if a picture, for example, having twelve inches as its longest dimensions is to be reproduced, the camera is to be removed to the mark twelve on the railway, and the back end of the camera to the mark twelve on the base board of the camera.

Provision may be made for securing the camera in any position in which it may have been adjusted.

In order to facilitate the use of the apparatus for the production of positives from negatives, provision may be made for supporting the negative in the same position as that described for the book-holder; or provision may be made to alter the position, and a second pointer or index attached to the camera carriage at a distance from the other equal to the distance between the front and back of the book-holder.

To support loose drawings, photographs, pictures, we may provide a board to which they may be fixed, such board being furnished with a ledge or brackets at right angles thereto, so as to rest upon the top board of the frame.

7,983. *May 14th*, 1889.—"Making Lantern Slides for Copying." Walter Griffiths, Highgate Square, Mosley Road, Birmingham, Manufacturer.

My invention consists of a new and more convenient arrangement for holding photographic negatives or positives—lenses and sensitive plates for the production of lantern slides, transparencies, or other copies of the aforesaid photographic negatives or positives—in such a way that the instrument is always ready fixed as regards the required size, the required position, and the required focus of the said photographic picture, and without the necessity of any preparing whatever, as distinguished from the ordinary methods and necessities in producing lantern slides and transpareneies.

I carry out my invention as follows:—

The focus of the lens to be used having been discovered or determined, I prepare a tube, preferably square, and of the length to suit the said focus. This tube may be of any suitable material, such as wood, metal, mill-board, or straw-board, &c., or a combination of these materials; as an instance I use wood, straw-board, and cloth combined. Into one end of this tube, which I will call the "front," I fix a grooved frame, into which to slide the photographic negative or other plate, and which is thereby held in the required position.

These grooves are made to fit any one size of plate, such as the standard photographic sizes—6½ by 4¾ inch, 8½ by 6½ inch, &c.

Immediately in front of this groove I place, if required, a second groove, into which may be inserted a ground glass, for the better diffusion of the light passing through the negative or photographic plate, this being often desirable.

At the opposite end of the tube, or at any required distance up it, I fix a frame with an aperture in the centre, in which aperture is to be placed the sensitive plate, before-mentioned, and which may be held in position by a spring, or any of the usual devices. Between these arrangements, at each end, I insert a third frame in the aforesaid tube, this third frame carrying the lens, which is to project the picture upon the sensitive plate mentioned, and placed in the aperture mentioned.

I provide a double cap or lid, which fits over what I call the back end of the tube, its function being to protect the aforesaid sensitive plate from all light except that passing through the lens mentioned, and which light contains the image from the negative or photographic plate situated in the grooves at the front end of the tube. Small handles, or such like, may be placed on the lid or cap or other parts, for convenience in handling.

I complete the apparatus ready for use by setting the aforementioned frames in such relative positions that an image of the negative or photographic plate is projected upon any sensitive plate in the back end of the tube, with all the requisite sharpness of focus, and correct size and position, that once being fixed, all further setting may be dispensed with, and the instrument rendered always ready for immediate use.

10,092. *June 20th*, 1889.—"Improvements in the Construction of Lanterns." John Farmer Chapman, of the firm of Farmer and Chapman, of Caledonian Works, Bilston, Staffordshire. Tin-plate Workers, and Japanners and Wrought Iron Hollow-ware Manufacturers.

The object of this invention is to so construct the articles that the tops and bottoms may readily be packed as detached from the bodies, and the bodies themselves be opened out, so that they may be packed flat-wise, or approximately so, one upon the other, and the parts be readily put together and fixed in place on arrival at their destination.

The inventor claims:—

1. A lantern, or lamp, or lamp head, which is similar in character to a lantern, having the top and bottom made separately from the other portion of the body, so that they may be packed detached therefrom, and the sides, including the door (or vertically divided portions of the cylindrical part of a round lantern, lamp, or lamp head, of the character described), hinged together with hinges of which the pins may be used also to fix the top and bottom to the sides.

2. A lantern, or lamp, or lamp head, which is similar in character to a lantern, having the top and bottom made separately from the other portion of the body, so that they may be packed detached therefrom, and the sides, including the door, (or vertically divided portions of the cylindrical part of a round lantern, lamp, or lamp head, of the character described), hinged together with hinges of which the pins may be used also to fix the top and bottom to the sides, said top and bottom being provided respectively with turned-down and turned-up edges (or, in the case of a round lantern, lamp, or lamp head, of the character described, with a turned-down and turned-up portion respectively of its edge).

3. A lantern, or lamp, or lamp head, which is similar in character to a lantern, constructed substantially as described with reference to drawings.

Proceedings of Societies.

London and Provincial Photographic Association.

At the weekly meeting on the 15th inst., Mr. P. Everitt occupied the chair.

Mr. Pask passed round some silver prints showing red patches. The prints were on paper sensitised by himself; he had not experienced markings of this kind before.

Mr. W. E. Debenham thought it arose from weakness of the silver bath.

The Hon. Secretary believed the markings to be due to the paper having been kept in a damp place.

Mr. W. H. Prestwich said that he had several reams of albumenised paper toned a blue colour which he wished to decolourise; he found that a little nitrate of potash added to the fixing bath had the desired effect. He enquired if the use of the fixing bath was likely to prove detrimental to prints.

Mr. W. E. Debenham suggested the use of a chloride of lime toning bath in preference.

The Chairman showed some sheets of blotting paper made from cotton waste; it was smooth, tough, and absorbent, and well adapted for blotting off sensitised paper.

A question from the box—"Is the stability of a print increased by using an alum bath after fixing?"

Mr. W. E. Debenham believed that it was. The results of his experiments in this direction had been published.

The Chairman said that he had noticed that the tone of prints turned more purple a few days after toning, fixing, and drying.

Mr. J. S. Teape said that he had noticed the same thing.

Bristol and West of England Amateur Photographic Association.

The monthly meeting for May was held in the Queen's Hotel on the 2nd inst., Colonel Playfair in the chair, when an exhibition of slides entered by members for the Society's lantern competition took place. The slides entered were few, comparatively, but made up for the most part in quality what

was lacking in quantity. They were entered in three classes, under the heads of landscape, architecture, and figure subjects, and in sets of six or more, numbered. Members present voted during the exhibition of the several lots, and the result was declared later, Mr. E. Brightman being found ahead in all three classes.

A special feature of the evening was the use with the lime-light apparatus of the patent saturator, invented by A. W. Scott, of Weston-super-Mare. For the purpose of comparison, the ordinary mixture of oxygen and coal gas was first employed, some slides outside the competition being passed through. On the employment of the saturator, however, so marked a superiority in the illumination was at once perceptible, that all present were of opinion that the light was more than doubled. The saturator consists of a spiral worm or perforated tube, coiling through a cylinder packed with asbestos, or some similar material, and soaked in gasoline previous to use. This arrangement is encased in an outer cylindrical body of tin or brass, having a small box in conjunction with one of its sides, in which burns a wax night-light, which gives off just enough heat to vaporise the gasoline about as fast as is necessary. The tube from the oxygen cylinder being connected with the lower end of the spiral worm, a current of oxygen gas is allowed to pass through, and it "saturates" itself on its way with the gasoline vapour liberated by the warmth in the interior cylinder. Thence passing directly to the jet, it is employed precisely as the mixed gases are in the oxyhydrogen limelight, and the result is probably as good.

Professor SCOTT, the father of the inventor, conducted the demonstration, and shortly recounted the various advantages of the saturator.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A MEETING of the Society was held in the Mayor's Parlour, Old Town Hall, on the 14th inst., Mr. GEO. BANKART in the chair. Two members were elected. The report of the excursions committee was brought up, and the following recommendations as to excursions were accepted:—June 19—To Stratford-on-Avon; July 17—Forest District; August 14—Miller's Dale, half-day; September 11—Maxstoke Priory.

The medals were then presented to the successful competitors in the print competition, held April 15, as follows:—Society's medals (for prints over whole-plate)—Silver medal, Mr. Geo. Bankart; bronze medal, Mr. F. Pierpoint. Past President's medals, presented by Mr. Geo. Bankart (for prints under whole-plate)—Silver medal, Mr. A. W. Wilson; bronze medal, Mr. W. Jolliffe.

Mr. Sculthorp having resigned his position as treasurer to the Society, the hon. sec. was requested to convey the hearty thanks of the Society to him for his past services, and Mr. A. W. Wilson was unanimously elected to the post.

THE SOCIETY OF ARTS *conversazione* will take place at the Natural History Museum, Cromwell Road, S.W., by permission of the Trustees of the British Museum, on Friday, 27th June. The reception by the Duke of Abercorn (Chairman) and the members of the Council of the Society will commence at 9.0 p.m. The bands of the Grenadier Guards and the Scots Guards will perform during the evening.

RECEIVED.—From Mr. Alfred Jubb, Huddersfield, "The Art and Practice of Interior Photography," by F. W. Mills. The book is divided into two parts, the first comprising apparatus, exposure, orthochromatic photography, the dark room, and various matters involved in making the negative. Part II. treats of the various printing processes; and this is followed by appendices giving the tables usually inserted in photographic manuals. The negatives from which the illustrations are produced were specially prepared, the author states, to illustrate the text by examples of different styles of work.——From Wilhelm Knapp, Halle A.S., the third edition of "Anleitung zur Photographie für Anfanger," edited by G. Pizzighelli. This book for beginners consists of 200 pages, and has 101 illustrations.——From Messrs. F. E. Becker and Co., illustrated and descriptive cata-logue of photographic apparatus and material; a book of nearly 200 pages, with a comprehensive index.

Answers to Correspondents.

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

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

"APPLES."—*Discolouration.* The yellow marks on your print seem to be caused by atmospheric sulphuration or an escape of gas getting into the frame, for you notice that the margin, where pressure is applied, is free from yellow stain. The mount is not at fault, for all the covered parts are perfect; neither is the starch wrong. In short, unless you have recently been throwing down your silver residues, or working with sulphuretted hydrogen too near the house, we should be inclined to suppose that a leakage of coal gas, or of foul air, had tinged the whites of your print. Try a paper smeared with acetate of lead to discover the origin of these foul gases, which are evidently doing you some damage at the present time.

J. W. M. (Stroud Green).—Wants to hear of a good white light for copying purpose without resorting to electric illumination. Mr James Downey, of Eldon Street, South Shields, will give you an account of the Ligroine lamp; or, you might enquire of Messrs. T. Fletcher and Co., of Warrington.

LANE.—*Back Numbers.* If complete, or nearly so, you might offer them for sale by advertisement. Otherwise they are only valued as waste paper.

A. W. L. (Finsbury Park).—*Slow Toning of Albumen Prints.* The method of ammonia fuming ought to meet your case, and this would neutralise the excess of acid which causes you so much trouble. *Lens for Groups and Buildings.* A rapid rectilinear for 12 by 10 would be suitable, or a wide angle if you are often required to work in cramped positions.

J. A. D.—The hearing lasted three days, and many interesting points were touched upon. The jury were unable to agree, but we were told that the majority was in favour of a verdict for the defendants.

COL. WATERHOUSE.—Owing to a full programme for the May meeting, your valued communication could not be read. The date will secure priority, although it may have to stand over until June; or, very likely, it may be published in the *Journal*, if taken as read.

J. E. B. — *Bromide Prints and Platinotypes.* 1. You may readily distinguish between them by touching the prints with a drop of corrosive sublimate solution, $HgCl_2$, which has no power of acting upon platinum, whilst silver prints of any kind would be instantly bleached. 2. Quite true, the price of platinum has been very considerably advanced, being now about 54s. per ounce.

PAT.—*Leather Photographs.* Why select leather as the basis, when you can so readily obtain more uniform materials or layers on which to work? This is going back to the earliest and crudest phases of photography, such as practised by Davy and Wedgwood.

CHEMIC. — *Boride of Silver.* There need be no fear of carbon reducing boracic acid or borax in the presence of silver; the experiment referred to necessitates the employment of magnesium along with the borate of silver.

W. L. P.—We have not heard of any such forthcoming exhibition. Let us hear further particulars, if you have any definite information.

R. B. B. (Glasgow).—*Photo-Engraving.* A very good account of the photogravure process was recently given, with a practical demonstration, at the Camera Club Conference by Mr. W. T. Wilkinson. See the NEWS of March 28th, p. 237.

PHOTO-LITHO.—*New Albert Transfer Paper.* This was not procurable a few weeks ago, when we had occasion to enquire on behalf of another correspondent.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1656.—*May* 30, 1890.

CONTENTS.

PAINTERS AS JUDGES OF PHOTOGRAPHS.

IT has for a long time been the custom at photographic exhibitions to invite an artist or two—sometimes more than two—to join with photographic experts as judges of the works sent in for competition, their province being to examine the pictures, and to award medals or other prizes to those which, in their opinion, are best entitled to distinction. That they exercise this power with honesty of purpose and with great good nature—for time with them means money—no one can for a moment deny, and it would, indeed, seem ungrateful and unnecessary for anyone to raise an enquiry as to that phase of the question. But it has more than once been asked—not, we may say, in parenthesis, by disappointed exhibitors—whether painters are qualified judges of what a photograph should be.

At first sight, it would perhaps appear to many that the question can be dismissed in a very easy manner. An artist's business is to make pictures, and surely no one else can be a better judge of what a picture ought to be. This would certainly be a correct way of regarding the subject if all pictures were produced by the same process and in the same medium; but we know that this is not the case, and that the means by which a photograph is rendered possible are very different to those adopted by the artist, who causes his very thoughts to grow upon the canvas.

By a long course of study, involving intense application and observation of things around him, he has mastered the art of creating, with a few apparently magical strokes of his brush, images which have either been first impressed upon his retina, or which he has evolved out of his inner consciousness. The roughest sketch of a skilled artist is often a masterpiece, and will afford more pleasure to the earnest student than will the most finished picture. It may be a landscape, a seascape, or perhaps a rapidly executed study of the human face. It is quite rough in texture, and the lines of the brush are evident; perhaps even the paint stands up in ridges where the palette knife has been. It is not intended for, nor will it bear, the closest examination, but we must retire from it a short distance, and then we shall see how excellent it is. Now let us try an experiment with this rough sketch in oil. Cut a hole the size of a penny piece in a square of cardboard, and cover it over the canvas so that only part of the picture enclosed within that little circle is visible. It is meaningless; it is a patch of paint, and nothing more. The painting, we at once acknowledge, must be studied as a whole, and at a certain distance, or its beauties will never unfold themselves; but, seen thus, we cannot fail to admire the skill of the artist, and wonder how it is that he is able to express so much by so little.

But how different is this picture to a photograph. Its very roughness, which constitutes one of its chief charms, exhibiting as it does the power of mind over matter, would not be even tolerable in a photograph. Its want of detail, its lack of sharpness, would at once condemn it in the eyes of a man whose art education had been confined to photography. Such a man would, however, be able to tell us that by certain devices he could mimic these effects which are so dear to the artist. He would say that by purposely throwing his lens a little out of focus, so as to soften the outlines of his picture, and by other little devices during the printing operation, he could make his photograph appear not unlike a painting in monochrome. He might also truly say, that sometimes by accident—by an error in development, for instance—a negative will give a peculiarly soft misty effect when printed, which will at once attract the eye of a painter. Let us suppose that such a picture finds its way to an exhibition where an artist is among the judges. The painter at once recognises an effect that he would fain produce on canvas with his brush. His practised eye insensibly clothes it with colour, and he admires it as something which he has never before seen in a photograph. To his mind, therefore, it stands out distinguished by an indefinable beauty from its fellows. It more nearly approaches in its nature a painting than anything else

on the walls around him, and to it, in his honest opinion the medal ought to go. If this view be supported by the other judges present, who will perhaps hardly like to set up their opinion against that of an R.A., the prize will go, not to the best photograph, but to the one which most resembles in appearance and general treatment a painting.

It is a recognised canon of art that a worker dealing with a particular material shall not hide its identity, and attempt to make it imitate something else. The æsthetic craze of a year or two back—laughed at as it rightly was for many of its extravagances—at least did good in teaching people that a plain coating of honest paint was better than graining to badly imitate something else, and that red brick is not improved by stucco to make it appear like stone. The woodcarver must remember that he is working with wood which by its nature lends itself to a certain treatment, and that he must not produce from it the solid ornament more fitted for stone. The worker in iron must follow the path laid down for him by Quentin Matsys and others, and must not trespass upon the domain of Grinling Gibbons, or attempt to reproduce the delicate filagree work of those who work in gold, silver, or ivory. A painter in oils would at once acknowledge the foolishness of attempting to imitate the work of his brother in water-colours, and the pastellist will, if he be wise, steer clear of both, knowing that his coloured chalks have a field all their own. We consider that the same thing should hold good with photography. It has its own particular merits and demerits, and it should not be bent and tortured to resemble that which it is not, and with which it has little in common. Those who juggle with it, and try to get certain effects from it by purposely putting lenses out of focus, and otherwise abusing their apparatus, would do well to throw up photography altogether, and take to some branch of art where the hand can be made obedient to the eye, and where the will rules both.

But to return to our question, "Are painters qualified judges of a photograph?" We humbly think not, and have set forth our reasons for this opinion. At the same time we trust that we have also made plain our high admiration for an artist's work. His opinion would be invaluable were it confined to pointing out errors of composition, or indicating faults which might have been remedied by a more judicious position of the camera. But if he be ignorant of the many difficulties with which a photographer has to contend—and has not had himself some practice with the camera—he is hardly qualified to pronounce judgment upon a photograph placed before him. He is, indeed, in much the same position as a photographer would be if called to pass judgment upon a number of paintings. The photographer, like the artist, would be trammelled by preconceived notions of nature which he had gathered from his own daily practice. He would at once discard all excellencies due to subtle contrasts of colour, for they would be beyond his ken, and if he were called upon to pass an opinion upon, say, one of Turner's pictures, he would probably assert that it was most outrageously out of focus, and would suggest that the artist would do well to insert in the picture the details which were lacking.

GLASS SCREENS FOR DEVELOPING-ROOM LAMPS.

From current literature it appears that some confusion prevails in the minds of a considerable number of photographers as to the best kind of light to use in the developing-room, and its relative amount of safety. The only way out of this maze is to consider each item upon scientific principles, and the one selected for consideration now is that of the glass screens of developing-room lamps.

Sometimes it is said that such-and-such a sample of red or other glass is not safe, and it is condemned accordingly, after being tested somehow, either by means of photographic plates or by the spectroscope. The circumstance should be borne in mind, however, that all transparent coloured glasses are white, or, rather, practically colourless, if made in sufficiently thin films, and that only as the thickness of the glass increases, does its power of selective absorption of particular rays of the spectrum become apparent. Hence, a sheet of ruby or other glass which has been condemned, might have been accepted by the person who rejected it had he tried two thicknesses instead of one. The second sheet of the same average ruby glass scarcely reduces the light visually more than if it had it been a sheet of common window glass, because the first piece cuts off nearly all the rays it naturally absorbs, and the small fraction remaining has alone to be cut off by the second sheet of glass. If, however, the sample of glass be really bad for the purpose, because it naturally freely transmits a band of rays injurious in developing, such rays may more or less pass through the second sheet as well as the first. Once, in an instance in which a photographer had, after employing his mode of testing, rejected one sheet of red glass in favour of another, we recommended him to try two thicknesses of the first glass, and it proved to be better for his purpose than the single sheet of glass which he had originally accepted.

In all experiments of this kind the light should be practically constant; that given by any particular make of candles—which candles are turned out commercially in tolerable uniformity—is near enough for utilitarian purposes. The flame should always be at exactly the same distance behind the screen. The man who uses variable daylight as his source of illumination, and then arranges his screen to make the light inside the room fairly safe under all circumstances, is acting against first principles, and straining his eyesight considerably and unnecessarily, taking the average of a whole year's work.

Why is an ordinary sheet of ruby glass transparent, and a sheet of iron opaque? The theory is that the molecules of the glass are all in a state of vibration, and that waves of light of different wave-lengths beat upon the vibrating molecules. Those waves of light

which coincide in time of vibration with the period of swing of the molecules, are absorbed by the latter, and increase the motion of the molecules; such increased motion is made evident in the form of heat. The glass grows warmer by cancelling such rays, for power is never lost; it can only be transformed. The waves not of the same period as the molecules have not their energy taken up by the latter, so pass round them, and come out at the other side of the sheet of glass. A sheet of iron contains atoms or molecules which respond to all the waves of the luminous spectrum, hence none of them pass through. Ice absorbs the invisible rays of the sun freely, but transmits the visible rays, so whilst the former rays will gradually melt a lens made of ice, the visible rays will pass through the ice lens freely, and can then be made to ignite gunpowder.

CURIOUS EXPERIMENTS WITH LIGHT.

The following is an abbreviation of a letter from Mr. G. M. Minchin, of the Royal Engineering College, Cooper's Hill, which appeared in last week's *Nature*:—

Before publishing in detail the results of many experiments on the generation of electricity by the action of light falling on certain sensitive substances, I wish to make known a result which seems to be of a most remarkable character.

The photo-electric cell which I employ consists of a small glass tube, filled with an alcohol; two metallic plates are immersed in the liquid; each plate is connected with a platinum wire which may either be *soldered to the plate* or passed through a small hole in the plate and *pinched tightly to it*: these wires pass through the ends of the glass tube and are sealed into it. The poles of the cell are connected with the poles of a quadrant electrometer.

The plate is sensitised by a peculiar process, the mere publication of the details of which would not enable a reader to make it successfully. The publication of the process is therefore reserved for a future occasion. One plate is quite clean—not sensitive to light. The cell is fixed vertically in a clamp. When the cell is of the "impulsion" kind, what happens is as follows: Daylight being allowed to fall on the sensitive plate, the spot on the scale of the electrometer moves, and after a few seconds comes to rest, indicating an electromotive force varying with the intensity of the light, its amount for such diffused daylight as we have at present (May 10) at noon being between $\frac{1}{2}$ a volt and $\frac{3}{4}$ of a volt—which is, I submit, a surprisingly great magnitude. On the withdrawal of the light, the deflection falls, and there are means of rapidly getting rid of the deflection without injury to the cell. Either before or after this deflection caused by light ceases, let a slight tap (sometimes inaudible) be given to the base or clamp in which the cell rests, and then results a remarkable change in the cell. *It is no longer sensitive to light.* The insensitive state is indicated by a rapid return motion of the spot on the scale; it is merely *indicated* by this motion, there being no necessary connection between this motion and the insensitive state, for if the cell were now left for some time (perhaps an hour or so) in the dark, the disturbing E.M.F. of the cell would vanish, and there would be nothing to tell us that the cell remains insensitive; but that it is really still in the insensitive state we find at once on again exposing it to light. Another gentle tap given to the clamp, or the stone table on which the whole apparatus rests, will restore the sensitive state; and so on indefinitely, the sensitive and insensitive states following each other and being produced, in the case of many such cells, with great ease.

These results I found a long time ago, and they have been seen by, or communicated to, several scientific friends. From the first, I maintained that the results are due to an alteration of the molecular state of the sensitive surface, or of the layer of contact of this surface with the liquid, and that in one arrangement of the molecules the light energy can be taken up electrically, while it cannot be so taken up in the other.

I now come to the special point which is the occasion of this communication. A few days ago I was investigating the effect of static charges communicated to the plates on the sensitive and insensitive states, and in the course of these experiments I found that if a Voss machine, not in any way connected with the cell or the electrometer, was worked in the room while the cell was in the insensitive state, *the moment a spark passed between the poles of the Voss, the insensitive state was altered to the sensitive*, whether the cell was connected with the electrometer or not. Finally, I found that the best method of showing the inductive effect of the spark is to connect an insulated wire, apparently of any length, to either pole of the cell, and to place the poles of the Voss near the wire (a distance of several feet will do with a spark about half-an-inch long).

If the cause to which I have assigned the change from the photo-electrically insensitive to the photo-electrically sensitive state of the cell is the true one, it is impossible to avoid the speculation that impulsion results of this kind may be very common in the economy of nature; and that the mode in which solar energy is taken up by plants may be effected, and even altered in kind, by sudden electromagnetic disturbances. The effect of a Hertz oscillation is, indeed, not confined to an alteration of a plate from the insensitive to the sensitive state; for I have cells in which if the sensitive plate is, on exposure to light, electrically negative to the back plate, a Hertz oscillator at a distance will reverse the relation when the plate is again exposed to light.

While the above communication was going through the press, I made an experiment which renders it almost certain that in the impulsion cells the results are due to the formation of some *oscillating layer* at the surface of the sensitive plate. Being anxious to keep the alcohol in the cell (which in this instance was closed by a ground-glass cap), I sealed the cell into a glass tube through the extremities of which the wires of the cell passed. The effect of the disturbance thus resulting was that no amount of tapping the support of the cell would change it from the sensitive to the insensitive state, although before being thus treated it was sensitive to the most minute disturbance. I suspected, however, that after some hours the liquid and the plate would again enter into the peculiar relation on which the impulsion results depend, and so it turned out; after three hours the cell could be rendered insensitive by taps, and sensitive by the inductive effect of a Voss machine.

Eikonogen.—It will be seen, from an article by Julius F. Saehse, quoted on page 414 of our present issue, that eikonogen is the favourite developer with professional photographers of Germany, whose opinions were recently asked by circular.

ETHICS OF PHOTOGRAPHY AND PHOTOGRAPHERS.*

BY J. TRAILL TAYLOR.

Some are unkind enough to allege that there is no system of ethics applicable to photographers and photography, unless in the inverse application of the term, and they adduce examples in favour of this negation, to some of which I shall have occasion to allude.

Can photography lie? it has been asked. Can photographers lie? or, to put it more plainly, Do photographers lie, and why, or under what circumstances, do they lie? Is it necessary they should, and is it expedient that the strict and severe Temple of Truth be erected in its midst? In the social world strict ethics are largely ostracised; ethics and politeness, popularly so called and practised, are not invariably in harmony.

In what I say, I am not supposed to have reference to photographers as social, private individuals, but merely to them *as* photographers. In itself photography is but a plastic tool in the hands of those who know how to employ it, and it may be made to subserve good or evil. My present purpose will be served by pointing out certain directions in which deviations from pure ethics are occasionally made by those who handle the camera. In doing so, I take no cognisance of departures from accuracy of statement made to serve the exigencies of trade or commerce. Deliberately false or misleading representations do not enter into the topic before me, this being simply *falsehood* open and palpable. Neither do the tradesman's arguments to his innocent purchaser that such and such a piece of apparatus is the thing for him to have, because such an one uses none else, and he has obtained a plethora of medals at exhibitions; this is *humbug*. Nor does my category include the one who assures me a lens is ten inches in focus, while, measured properly, instead of from the posterior end of the brass work, it is twelve; this is *ignorance*. Nor the tramp who, pointing his camera at a house under pretence of photographing it, secures the money in advance, without having any intention of developing his plate, if plate there was in his camera; this is *fraud*. Nor the young Daguerreotypist who, having succeeded in taking one or two fairly good Daguerreotypes, handed his camera over to a more experienced man, after having, unseen, smeared iodine on the shutter of the dark slide, by which his rival failed *in toto* in producing a picture; this is *trickery*, and, under some circumstances, pardonable. Nor the one who rubs powdered nitrate of silver inside the front of the dude's hat at a picnic with ladies when the thermometer is in the nineties; this is *mischief*. These, and numerous examples of like nature of departure from the straight path which might be adduced, scarcely come under the heading of *mal* ethics, although they are not ethical. And yet the line of demarcation is hard to draw.

Nice distinctions may even be drawn between artifice, deception, fraud, charlatanry, empiricism, delusion, white lies, and black lies, but they all belong to the same family.

Photography is in itself so absolutely truthful that it is accepted as evidence of realism. The camera merely depicts what is placed before it. But realism is not necessarily, and does not necessarily convey, truth. The large lump of coal placed on a cloth-covered table with a few miniature shrubs and twigs around its base, and then photographed on a large scale to do duty as a scene in the Rocky Mountains, or anywhere else, cannot be said to be in accord with ethics if such be done with intent to deceive, even although the trick cannot be discovered by the experienced geologist who examines the perfect strata through his magnifying glass.

A point of sight may be selected for a view which, when aided by a lens of short focus, shall give as a result a photograph true as a piece of realism, but conveying the false idea that the duck-pond in the foreground is a large lake, and that the shrubs or trees of six foot height almost rival the giants in the Maraposa Grove in California. A realistic photograph, while thus geometrically true, may not only fail in conveying a truthful expression, but one the every reverse.

Stepping from nature outside to inside the studio, who has not heard of the two sets of solid furniture—one being in miniature, to be had in use solely when men of Zaccheus-like stature desire that their circumscribed longitude should be elevated into that of mid-stature by contrast with the surrounding tables and chairs. I touch only lightly upon one of the most prevalent of *mal* ethics in the studio, because it is the outcome of the ignorance of the photographer; I refer to the two entirely different kinds of perspective to be so often found in one picture—that of the background and side scenes on the one hand, and that of the figure on the other. In a portrait—a standing figure of a lady full length—which was seemingly much admired at a recent exhibition, the point of view of the background was below the knee, that of the figure itself was about opposite her eyes. But some background painters and photographic artists so-called do not appear to think that perspective has anything to do with their art. The amateur who takes his portraits out of doors with natural surroundings never encounters this anomaly; the perspective of his figure and background necessarily harmonise, and is it to be wondered at if the educated artist or observer of nature is found to give preference to one over the other?

Artists seem to arrogate to themselves a prescriptive right to improve upon nature. I have heard the late Sir George Harvey, President Royal Scottish Society Academy, speak in approving terms of a local artist who always enlarged the eyes of his subjects when working them up by the brush or pencil; photographs, in the estimation of this gentleman, always made the eyes too small—for artistic taste, I presume. But æsthetic truth and ethical truth are not the same thing, although there are cases in which one may with advantage be made subservient to the other. I heard a famous New York photographer giving directions to his managing printer, who was one morning submitting to him rough proofs from the negatives of the preceding day. "Take a big slice off that lady's belly (indicating with a pencil) and place it on behind. It will much improve her appearance." And it did so. "But that is not like ———," I remarked of a new portrait of a famous actress, since extensively published; "she is rather sour and scraggy, while this one is amiable and somewhat fleshy." "Oh," remarked the photographer, "a retoucher has been working a whole day on that face in order to obtain this effect. She doesn't care whether it is a good likeness or not, so long as we make her good looking.

Retouchers! O, what ethical sins have you not to answer for! You supply all the crudities and deficiencies of nature. At your magic touch strabismus vanishes. Where nature has been unkind in the matter of eyes, 'tis

* A lecturette at the London and Provincial Photographic Association.

yours to supply the required number, and convert minocular into binocular vision; to round the sharp angles of the features by the transference of adipose tissue from where it is not wanted to where it is needed; to fill up the furrows dug by time; to enact the chiropodist upon facial excrescences: and the dentist, in case the taker of the negative has forgotten to stuff cotton wadding pads inside the mouth to ensure a pleasant rotundity to the wan cheeks—a thing a New York photographer never omits. *You* do not believe that the man or woman exists who, in his or her heart, endorses the sentiment of Oliver Cromwell about being painted with his wrinkles and warts. And you are right. They may assert as much as they like, but you well know such phrase and fact do not coincide, and accordingly you dress your ewe in lamb fashion, taking shelter behind Luther's dictum, that a great artist portrays a man as he should be, and not necessarily as he is.

Perhaps it is in the West States of America where retouching has its highest development. A reporter in California interviewed a photographer and conversed on retouching.

"What do you think of that?" said the artist, showing a cabinet portrait. It was simply the likeness of a mild, motherly, middle-aged lady, and the reporter said he could see nothing remarkable about it.

"I suppose not. How do you like this?"

"Good Lord, what a fury!" exclaimed the reporter, as he looked on the deeply seamed face of an old woman, with lowering brows, thick, cruel lips, and a brutal chin.

"Same subject," explained the photographer, putting the two pictures side by side. "Shows what retouching can do."

"But the retouched one does not look a bit like the woman who sat for it."

"Of course not; that's the beauty of it. The old woman wouldn't have taken the picture if it did. A photographer these days has to be barber, surgeon, and dentist. Look at this."

It presented a man with a bald head and a twisted eye. In the finished picture the eye was straight and the baldness gone.

"For friends of his youth in the West, you know. Here's another."

This time a young man with two of his upper teeth protruding repulsively was shown. The tusks had been extracted by the artist's brush.

"Corresponding with a Boston girl he had never seen, but that he wanted to come out and marry him."

The reporter looked over piles of negatives, and compared them with the pictures made up from them, and sent out unblushingly by the sitters as likenesses. Plain women were made pretty, pretty ones given beauty, and in all cases the looks had been vastly improved. No woman seems to want to have herself shown just as she is, and the men are quite as vain. Very young men are frequently amazed at finding how much heavier their moustaches and downy siders are when photographed. The camera makes lean women plump and fat ones slimmer, knocks off ten years at least from the age of the mature, and in ninety cases out of a hundred lies shamelessly. Of course, it is the camera, not the photographer, who is to blame.

(To be continued.)

The Photographic Club.—The subject for discussion on June 4th will be "Photo-Mechanical Processes."

HIGH ART.

The following, from last week's *Referee*, is not altogether complimentary to the photographic profession:—

They coaxed me up a hundred stairs,
  They lured me to their den,
For me they laid their artful snares—
  Those photographing men.
They dragged me to a room of glass
  Beneath a blazing sun,
I thought I should have died. Alas!
  I'm nearly fourteen stone!

They saw their victim pant and blow,
  They heard him cry, "I melt!"
But ne'er a one for all my woe
  One grain of pity felt.
They seized my head and screwed it round,
  And fixed it in a vice,
And simpered when they had me bound,
  "That pose is very nice!

"Look up—look up, and wear a smile,
  Look pleasant, if you please.
You must keep still a little while;
  Just straighten up your knees."
'Tis thus they jeer and jibe at me
  As, faint and hot, I try
An inch before my nose to see
  With sunstroke in my eye.

I think of all the bitter wrongs
  My later life has known;
I writhe beneath Fate's cruel thongs,
  I knit my brow and groan.
And still, with many a smile and smirk,
  The artist trips about,
And gives my chin a little jerk
  And sticks my elbows out.

Ye gods, am I a grinning ape
  To pose and posture thus?
Am I a man in human shape,
  Or turkey that they truss?
My head is free; with fiendish mirth
  I raise a vengeful hand,
And dash the camera to earth,
  And fell the iron stand.

I take the artist by the throat
  And pin him to the wall,
And jerk his chin and tear his coat,
  And hold his head in thrall.
I bid the trembling victim smile,
  I cry, "Be gay and laugh,
And in the very latest style
  I'll take *your* photograph!"

I twisted till I broke his neck,
  I baked him in the sun;
I left the room an awful wreck,
  And then the deed was done.
They held an inquest on the bits;
  Ye photographing crew,
Before to you the writer sits
  Just read that inquest through.

The opening soirée of the City Photographic Exhibition, under the auspices of the Photographic Trades Section of the London Chamber of Commerce, will take place in the Drapers' Hall, Throgmorton Street, this evening, at nine o'clock.

One of Mr. W. M. Ashman's photographs—which he showed us yesterday—of the interior of Bath Abbey, has a large stained-glass window in front of the lens rendered in all its details with unusual perfection and sharpness, and this without under-exposing the interior of the building; it forms a good sample of this difficult class of work.

DEVELOPERS USED BY GERMAN PROFESSIONAL PHOTOGRAPHERS.*

BY JULIUS F. SACHSE.

EARLY in the present year the publishers of *Liesegang's Photographisches Archiv*, in Dusseldorf, Germany, prepared a circular to be sent to the most celebrated professional photographers within the German realm, for the purpose of thoroughly settling the question as to what special developer, formulated for gelatine dry plates, was in most general use with professional artists who make portraiture their speciality, further asking information how their special formula works in every-day practice. As a test whether the scheme would meet with a favourable reception, and bring forth free responses, it was concluded to send out at first but half a hundred of these circulars as a feeler. To the surprise of the projectors of the scheme, twenty-eight replies were received within a few days.

The editor of the *Archiv* prefixes the list with the explanation that they do not wish it to appear as if they believed the success of photographic portraiture to depend solely upon the composition of the developer. We reproduce the list entire for the benefit of our readers, both amateur and professional, that they may gather such facts and hints as have proved of value in the practice and experience of the most successful artists in the far-off Fatherland.

The circular contained the following four leading questions, viz.:—(1) What developer do you use in your portrait studio? (2) What special properties or qualifications do you claim for your developer? (3) Give combination of solutions used in cases of normal exposure? (4) Do you use a preliminary bath (Vorbad), and what of?

Herr von Ayx, Mainz.—Developer—Eikonogen. Properties—The brilliant action on the half-tones and highlights during reduction, with proper manipulation. Composition (No. 1).—Sulphite of soda, 200 g.; distilled water, 3,000 g.; eikonogen, 50 g. First pulverize the sulphite, then dissolve in the water; to this solution add the eikonogen in crystals; place the whole in a water bath until the latter is wholly dissolved. (No. 2).—Carbonate of soda, 150 g.; distilled water, 1,000 g. For use, 3 parts No. 1, 2 parts No. 2. No preliminary bath.

Carl Bornträger, Hofphotograph Wiesbaden.—Developer—Eikonogen. Properties—It permits of a shorter exposure than any other developer known to me; works out fine detail, neither monotone nor too hard, with great rapidity. Composition (A)—Distilled water, 1,500 c.cm.; sulphite of soda, c.p., 100 g.; eikonogen, 50 g. Dissolve the sulphite and eikonogen in hot water. Keep this solution in a dark bottle with ground-glass stopper, in dark closet away from all contact with ammonia or acids. (B)—Distilled water, 500 c.cm.; carbonate of potassium, c.p., 75 g. For use, three parts A to one part B immediately before using. When plates are developed far enough, wash well under tap, then place in 5 per cent. alum bath for one minute, again wash thoroughly, and fix in bath: Water, 800 c.cm.; hypo, 200 g.; bicarbonate of soda, c.p., 40 g. No accelerator.

Heinrich Fritz, Hofphotograph-Greiz.—Developer—Eikonogen. Properties—Advantages over the oxalate developer formerly in exclusive use: 1. Shortening time of exposure by one-half, so that slower and better plates can be used; 2. Use of developer until exhausted, therefore much cheaper and convenient. Composition—Sulphite of soda, 100 g.; carbonate of potassium, 40 g.; eikonogen, 20 g.; to which is added a few drops of hypo, 1 : 50. (Note in the original the volume of water is not given.) By addition of water and bromide of potassium, over-exposed plates may be easily corrected. Accelerator—Unnecessary with above developer.

Arno Cersten, Hofphotograph, Altenburg 1 S.—Developer—At present only eikonogen (since six months), prior to that, oxalate and iron exclusively. Properties—The local water supply is strongly impregnated with limestone, and great difficulty was experienced in cleaning the hands and utensils while iron was used; therefore, eikonogen is now exclusively used. In addition, I value the rapidity of development, the softness and clearness of the shadows, in spite of which they still have enough strength. I use my own dry plates, made after Obernetter's modified formula. Composition—I rub 12 g. eikonogen crystals to powder in a small wedgewood mortar; pour this into a funnel; after closing the opening with cotton, I then add 50 g. pulverized sulphite of soda, then fill the funnel with 750 c.cm. distilled water; stir with glass rod until filtered. To this add 8-10 c.cm. concentrated solution of bisulphite of soda, at 38° R., which almost destroys the colour of the filtered solution. Then pour 38 g. of calcined soda (c. p.) in the same funnel with 250 c.cm. of distilled water; filter when dissolved; then pour both solutions together, and shake well. Thus I make 1 litre of developer in 15 minutes without using boiling water. Accelerator—Not necessary in normal cases; when necessary, take 1 part hypo to 3-10,000 parts of water; soak the plate a minute, then develop without washing. Fixing Bath—1 part hypo to 5 parts water; to 3 litres of this solution add 50 c.cm. of concentrated solution of bisulphite of soda.

Julius Schaar, Dusseldorf.—Developer—Eikonogen. Properties—Quick and strong action; the negative being very soft yet strong, without having to resort to intensification; with attentive manipulation the picture appears in three to four minutes beautifully modulated. Composition (A)—Distilled water, 1 litre; sulphite of soda, 10 g.; eikonogen, 10 g. (B) Carbonate of potasssium, 150 g.; distilled water, 1 litre; hypo, ½ g. Take equal parts.

L. Springer, Hirshberg in Schlesien.—Developer—During the past six months eikonogen, with great advantage, in place of all others. Properties—Magnificent, clear, yet strong negatives, when developed until the deepest shadows show through; results not to be obtained with any other developer. Composition (A)—Sulphite of soda, 200 g.; distilled water, 3,000 g.; eikonogen, 50 g. (B) Carbonate of soda (cr.), 150 g.; distilled water, 1,000 g. For use, A, 1 part; B, 2 parts. Fixing bath—Hypo, 250 g.; sulphite of soda, 50 g.; water, 1,000 g.; sulphuric acid, 8-10 g. In developing a plate, old developer is first used until the image appears; this is then poured off and completed with fresh developer until the negative is very strong, as the negative is apt to reduce in the fixing bath. In copying poor photographs the oxalate developer is used, as the eikonogen brings out the grain of the paper in too great relief. This fact in itself is a proof that greater results are obtained with eikonogen than any other developer.

I. H. Voight, Hofphotograph Homburg, v.d. Hohe.—Developer—Eikonogen for negatives as well as contact

* A digest of the useful information about developers, collected by the Dusseldorf publishers, appeared recently in these pages in a letter from our German correspondent. The present article of Mr. Sachse, from the *American Journal of Photography*, contains the details.—ED.

prints and enlargements on chloride and bromide paper. Properties—the image appears rapidly, and develops gradually until the required density is reached, when it may be immediately checked. If proper attention is paid to the work, neither intensification nor reduction is necessary with my developer. A clear picture is obtained, perfect in all detail. Water, 500 g.; sulphite of soda, 25 g.; carbonate of potassa, 5 g.; carbonate of soda, 15 g.; eikonogen, 5 g. Eikonogen must be pulverised in a mortar to thoroughly dissolve.

P. Barth, in Elberfeld.—Developer—Iron oxalate. Properties—Simplicity, greater capabilities of development, especially in the case where a large number of plates are to be developed consecutively. Composition—Saturated solution. Just so much iron is to be added to the oxalate as the latter will stand without becoming turbid. I wish to mention it is, on the whole, immaterial what developer is used. The whole difficulty in portrait photography consists in properly lighting the subject.

Emil Becher Dillenburg.—Developer—Iron oxalate. Properties—With this developer I always obtain the same results. It is easy and simple in its manipulation, and gives negatives such as are only obtained with hydroquinone or eikonogen under extraordinary favourable circumstances. It also allows, in my experience, shorter exposure. Composition—Sulphate of iron and oxalate of potash are dissolved in distilled water. For cabinet plates I take 12 g. iron to 40 g. oxalate, by normal exposure. When the light was weak, increase the volume of developer one-half. In over-exposure, reduce the volume of developer and add water. The chemicals must be pure. [Note.—I prepare my own dry plates.]

A. Blankhorn, Hofphotograph Offenbach a. m.—Developer—Iron oxalate; tried hydrochinon; plates fogged, time too long, preparation too complicated, also too dear. Properties—Simplicity of manipulation, absolute safety, and cheapness. Composition (A)—Sulphate of iron, 1 part; distilled water, 3 parts. (B)—Oxalate of potash, 1 part; distilled water, 3½ parts. Dissolve warm. Just before using, mix 1 part A to 2 parts B. For under-exposure add 1 drop soda (to -15-45 solution) when partly developed. In case of over-exposure 2-3 drops bromide potassium. Accelerator—For short exposures 1-2 minutes in hypo bath, 1-1,000 for instantaneous pictures of children invaluable.

(To be continued.)

THE LIVERPOOL PHOTOGRAPHIC EXHIBITION.

The Liverpool Amateur Photographic Association will next year hold an International Photographic Exhibition, and by permission of the Liverpool Corporation, in the Walker Art Gallery there.

The Exhibition will open on Friday, 6th of March, 1891, and close on Saturday, 4th of April, 1891. The intention is to keep the Exhibition open for four weeks only, but no frames can be removed until the "final close" of the Exhibition.

The Executive, being anxious to elevate the standard of public competitions in every way, intends to restrict its efforts to triennial public exhibitions; also, as far as practicable, to reduce the number of awards, the intrinsic value of a medal being, of course, a secondary consideration. It trusts that other associations and photographers will assist its efforts to limit public exhibitions, their frequency being somewhat fatal to originality and good work, as well as a severe tax on exhibitors.

Among the numerous conditions are the following:—Pictures from exhibitors abroad—*i.e.*, outside the United Kingdom—may be sent unframed, packed in boards. They will receive every care, and be framed temporarily, free of cost. The executive undertakes, free of cost to exhibitors, to unpack, repack, and deliver to the carriers at the close of the exhibition all exhibits, but will not hold itself responsible for any accidents. The best professional assistance will be engaged, and every possible care exercised.

The names of the judges will be announced in January, 1891, prior to the date fixed for entry of exhibits. The board of judges will consist of men of recognised artistic and technical ability, with whom the executive is satisfied that merit, and merit only, will be their guide in giving the awards. The name of the exhibitor and title of the picture must appear plainly on the front of the picture, mount, or frame.

The number of awards will be practically left to the judges, they having discretion to withhold entirely awards in any of the classes where more than ordinary merit does not exist, or the number of competitors is not considered sufficient. The judges have also power to award extra medals for work of special merit. The award of the judges shall in all cases be final. No medals will be awarded except those struck off the dies of the Liverpool Amateur Photographic Association, and no prizes or awards will be accepted from any other source. Except in the champion class, no picture of any description shall be entered or allowed to compete which has been previously exhibited at any public competition in the United Kingdom, an exception being made in favour of the Photographic Society of Great Britain as regards its 1890 Pall Mall Exhibition. Private exhibitions confined to members of photographic associations not to count as public competitions or exhibitions.

Properly printed, unmounted, duplicate copies of the winning pictures are to be supplied to the Liverpool Amateur Photographic Association, which will be preserved in a suitable album, to remain on view in the Club Rooms of the Association, as a memorial, and record of the prize winners of the 1891 Exhibition.

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

The excursions connected with the Photographic Convention have been arranged as follows:—

Excursion A.—Conway Valley, Tuesday, 24th June, Conway and Bettws-y-Coed; leaders, Messrs. C. H. Bothamley and W. Tomkinson; leave Chester by train for Llandudno Junction. Two parties will be formed—one for Conway, the other will proceed by train to Bettws-y-coed. (1) Conway.—Leader, Mr. C. H. Bothamley. Conway Castle, exterior and interior—Plas Mawr, an old Elizabethan Mansion—Town Wall and Gates—Beach—Shipping. A return journey to Llandudno can be made from the Junction at various times during the day. Tal-y-Cefn, a very picturesque village up the valley, can also be reached by rail, leaving by Llandudno Junction, and returning from Tal-y-Cafn. (2) Bettws-y-coed.—Leader, Mr. W. Tomkinson; by train from Llandudno Junction. Swallow Falls—Miners' Bridge—Fairy Glen—Conway Mill and Falls—if time, Ponty Pant and Ledr Valley. Those who intend to go on to Bettws, and wish to break the journey at Conway, must take return tickets for Bettws.

Excursion B.—Moreton Old Hall. Train *via* Crewe, to Mow Cop. Members must obtain of the local Secretary tickets of admission to the Hall and its surroundings. Only twenty can be issued for each day. This also applies to Thursday's excursion.

Excursion C.—Eaton Hall, Wednesday, 25th June; leader, Mr. G. Watmough Webster; by steamer from the Groves at 1.15; return fare, 6d. A Convention Group will be taken.

Excursion D.—Vale of Llangollen, Thursday, 26th June; leader, Mr. J. L. Mackrell. (1) On arriving at Llangollen the party will make for the Vale Crusis Abbey—Morning Light; (2) Cross over mountains to Chain Bridge and Berwyn, then down the Canal; (3) The Old Maid's residence.

Excursion E.—Moreton Old Hall; leader, Mr. F. Evans; train *via* Crewe, to Mow Cop. (1) The Royal Mersey Yacht Regatta, Friday, 27th June; leader, Mr. Paul Lange; (2) Hawarden. Train from Northgate Station. The Old and New Castle—The Park—Church and Village.

For the convenience of members wishing to visit Eaton Hall during the week, time tables will be published of the sailings of the s.s. *Ormonde*, the new twin-screw steamer specially designed and constructed for passenger traffic on the River Dee (under Board of Trade supervision), for the safety and comfort of passengers. Eaton Hall is six minutes walk from Eccleston Ferry. The return fare to Iron Bridge or Eccleston, upon production of membership ticket. The best view of the Hall is to be obtained from the river bank, near the Iron Bridge, in the morning before 10.30.

Permission has been given to photograph the following places, at any time during the week, upon production of a membership ticket—By the Dean, for Cathedral and precincts; by the Rev. S. Cooper Scott, for St. John's Church and Ruins; by the Duke of Westminster, for interior and exterior of Eaton Hall and Park; by Mr. W. H. Gladstone, for Hawarden Castle and Park.

RETOUCHING IN THE NEAR FUTURE.

BY REV. F. C. LAMBERT.

THE question, "Is retouching moral?" is one which certainly presents one aspect of the question, but the old adage, "Any fool can ask a question which may puzzle a wise man to answer," comes to my mind. For I may at once confess that this question is not altogether unlike the older one, "Is it permissible to use poison?" And like many such questions, can only be answered by asking other questions.

There is more similarity than may appear at first sight between the retouching and poison problems. We may reply that a poison in the hands of a competent person, familiar with its limits and uses, ceases to become a poison in the ordinary sense, and becomes an invaluable means of producing a much desired result. Everyone now-a-days knows that many of our most valuable medicinal remedies were for a time regarded simply as poisons, and marked "dangerous" in mental capitals. The reckless and ignorant use of them would have kept them on that formidable platform, had not kindly science turned these tyrants into faithful servants.

The liberal abuse and abundant contempt with which it seems just now in certain quarters a matter of habit to besprinkle the art of retouching, is certainly a matter for some consideration.

The question I would place before the consideration of practical workers is this: Is retouching being used with that care with which we should handle a most powerful drug, or with the freehanded lavishness with which our forefathers administered the cure-all black draught?

It is worse than foolish on the part of the professional worker to nurture ill-will against that part of the younger generation which is being told and taught by its artistic friends that professional portraiture is a burlesque on art, and reply that the public "will have it;" that they pay for the "glass-marble" surface, and expect to get it; for the question remains: Who taught them to expect them?

History repeats itself often enough, as we all well enough know. The introduction of this new power of course was followed by its liberal abuse. There is some connection, too, between the sharpness of detail and characterless smoothness of surface.

But the pressure of cultivated taste is slowly but surely making itself felt in a growing demand for a general softness of outline—less glitter and polish—and a not altogether unreasonable demand that a portrait should contain *some*, if small, resemblance to the original.

Therefore a word of friendly warning and suggestion may be offered to the professional worker—viz., "Progress, reform, change is in the air. The novelty of the egg-shell or billiard-ball surface is fading. The time-honoured glassy stare, with the two catch lights in the eyes, is losing its mesmeric effect. The discriminative sitter does not value sharpness-all-over (or anywhere, for matter of that) so much as many a negative maker would suppose. With less of this sharpness there is less need for retouching. Broad and simple lighting again will render that little still less. A characteristic pose, well caught, will make the sitter and his friends prefer *that* particular print with possibly faulty technique, to a more 'highly finished' show case specimen."

Voluntary reform from within is surely better than enforced reform from without.

The motto is "less and better;" less of indiscriminate smoothing this and sharpening that; and *what little* is wanted, let it be in the *right place*.

We may for convenience of expression say that so-called retouching of negatives is of two kinds.

1. *Remedial.—i.e.*, endeavouring to remove those results produced on the print which are not, under normal conditions, observed in the sitter—freckles, colour blotches, deep-seated scars, and all such differences which the plate emphasises in a way not usually observable.

2. *Constructive* (and often Destructive).—Removing wrinkles, straightening noses, and "improving!" nature generally.

It is with this latter sort that I would say, with the coming generation, "We'll have none of it."

That a certain amount—but not so much as many think—of No. 1 is not only legitimate, but necessary in our present state of knowledge, it is altogether idle to deny.

But the best doctor is the one who cures us with the least physic, and so the best retoucher is he who can *do* the most *with* the least. Quality, and not quantity. To touch without some knowledge of drawing, &c., is to prescribe without knowing the symptoms of the case or the properties of the drugs.

As the chemical and optical side of our art grows, the need for the retoucher will decrease in inverse ratio; but meanwhile, the man who hopes to gather approval and support must assuredly, in the very near future, diminish the quantity and increase the quality of the retouching part of his work. As to the education of the retoucher, and the duration of his work in the future, I must defer my remarks; concluding with one most significant fact—viz., the phenomenal growth of matt-surface—black and white printing processes, which very considerably reduce the quantity of remedial retouching required to produce prints, which commend themselves more to trained artists than any other, be they never so highly finished specimens.

MR. GLADSTONE AND THE AMATEUR PHOTOGRAPHER.—Says the *Daily News*:—"A story told at Hawarden about the amateur photographer stopping Mr. Gladstone in the village, and appealing to him just to stand one second till 'a snap picture' of him was taken, is quite correct; but our Chester correspondent says there is a sequel which has not been recorded. Mr. Gladstone shook his head, smiled pleasantly, and walked on towards the new station. Returning later, he found the enthusiastic amateur still standing near the same spot, and looking extremely unhappy at his failure. To a second appeal in these circumstances, Mr. Gladstone, good-humouredly entering into the situation, yielded, and stood in the village street until the camera was adjusted and he had been 'taken' by the now delighted artist, who, after profuse thanks, went on his way rejoicing."

THE ROYAL ACADEMY OF ARTS, 1890.

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

GALLERY No. 4.—As no photographic exhibition is complete without a view of Conway or Windsor Castle, so, also, is it almost axiomatic that no collection of portraits is complete without Mr. W. E. Gladstone, No. 361 (by Sir J. E. Millais, R.A.). The monotony, however, is relieved in this case by a grandson being added. "Grandpa" has his eye on the speaker, or rather the spectator, "as usual." Monotony is again relieved by having a view *from* Windsor Castle, 366 (F. Goodall, R.A.; for a view *of* the Castle *vide* 484), and certainly the bit of foreground wall is not the least attractive part of the canvas. The general light seems somewhat cold, and not inviting of prolonged study. Nor is our old friend the Conway utterly forgotten, *vide* 353 (D. Watson). No. 396 ("Puritans' First Winter," G. H. Boughton, A.) has all the subject and sentiment for a strong picture, but somehow, the distant figures do not look as distant from the foreground figures as their relative size would imply. No. 405 ("A Difficult Passage," E. W. Grier) presents an elderly gentleman—with a ruby nose—deliberating how he may best "shift" so as to "how" a difficult passage of "crotchets and quavers" on his "cello"—a simple, homely subject, without the usual superfluous studio properties (N.B., an unobtrusive background), and, taken altogether, a picture well worth a few mental notes.

No. 420 ("The Haven under the Hill," Sidney S. Morish) makes one think of the delightful fresh air of our coast line—say Luccombe Chine, or some of the Denes in Yorkshire. Study this picture carefully. The portrait study, No. 441 ("Lady Betty," P. H. Calderon, R.A.), is interesting, inasmuch as it presents a by no means unpleasing rendering of a tint of hair not generally admired. Poets have sung of tresses and locks of tints without number, almost without name, but one fails to recall any poetic epithet for this tint except we have licence to call it "golden." However that problem may find issue, it is a most admirable and masterly piece of painting. Note the graceful pose of the head, disposal of the hands, and simple lines of drapery—some valuable hints here. Before quitting this room, observe No. 398 ("An episode of the Deluge," C. E. Butler). No. 386 (Ditto, Mr. W. Blackden), and last, but not least, No. 499 (Ditto, ditto, H. J. Draper) in the next room (Gallery V.). These three would have gained rather than lost in the public eye had they been placed side by side.

GALLERY No. V.—The first thing which catches our eye on entering Gallery V. is No. 449 (Portrait, W. B. Richmond, A.), and almost involuntarily we say, Oh, what a splendid frame! and then pass on to No. 457 ("Harvest Festival in Cornish Fishing Village," W. B. Fortescue), a natural realistic gathering "of the people," who have brought their offering of fish and fruit. Note the effect of the back lighting of figures in the gallery. Is it a desirable or satisfactory thing to represent people with their mouths open as though singing? (On this point compare No. 774.) Close by is No. 458 ("Where Sea and River meet," B. W. Leader, A.); perhaps somewhat gaudy in foreground, nevertheless full of sunlight. Observe there is abundant definition without great extremes of small detail.

No. 462 ("A pound a leg," Leghe Suthers). An evening effect admirably rendered in subdued and harmonious tones and tints. The itinerant horse dealer offering "a pound a leg" for a doubtful nag from a still more doubtful gipsy owner. The arrangement of the parts is instructive and note worth.

No. 470 ("Conversion of St. Hubert," A. Lemon), showing Hubert, who, engaged in the pleasures of the chase to the exclusion of his religious duties, until a stag with a spectral crucifix presented itself and converted this merry huntsman from the chase to the cloister, where he "lived happy ever after," finally becoming Bishop of Liège, and bequeathing to all members of his race the power of curing the bite of mad dogs (query M. Pasteur). Altogether a dramatic composition, yet not unpleasing, excepting in the rawness of its sky, perhaps.

No. 473 ("Echoes of a far-off Storm," J. Brett, A.R.A.), a "stormy" letter to the plate maker demanding an explanation of that streak of thin emulsion or fog mark across the plate?

No. 485 ("The only Survivor," F. Bourdillon). The pose of kneeling figure is admirable, full of suggested strength and pathos.

No. 487 ("A Summer Night," A. Moore) calls to mind the word "stipple." The formal interlacing of the flowers is rather distressing. Some of the figures are well worth study as regards pose and balance.

No. 501 ("Yarmouth, I.W.," Henry Moore, A.). Note the "echo" of the two foreground cows "in focus," and the more distant ones less so, and how it gives depth of planes, gradation of distance, the simplicity of the lines of composition, general treatment and handling, full of light and air.

No. 507 ("Oliver Twist," James Sant, R.A.). A scene from the boundless store-house of Dickens. Who can forget his first impressions and sympathy with Oliver? "He had a crust of bread, a coarse shirt, and two pair of stockings in his bundle. He had a penny too—a gift of Sowerberry's after some funeral in which he had acquitted himself more than ordinarily well—in his pocket. 'A clean shirt,' thought Oliver, 'is a very comfortable thing; and so are two pair of darned stockings; and so is a penny; but they are small helps to a sixty-five mile walk in winter time.' . . . So after a good deal of thinking to no particular purpose, he changed his little bundle over to the other shoulder and trudged on." (Ch. viii.) Oliver before us seems a bit too fresh, may-be? Are the dog and sheep an artistic license? The shepherd in distance is not the least interesting part of the picture.

No. 519 ("Paris and Œnone," G. A. Storey). The red cap worn by Paris does not seem to quite harmonise with the red parts of Mrs. Paris' garments, nor does the youthful figure of Paris give one an idea of the sort of person to carry off Helen of Troy. Was it a case of Troy, Troy again?

The question proposed by C. Seton, No. 512 ("A doubtful Strad."), seems to find some sort of answer in No. 1050 ("A genuine Stradivarius," W. Gay). A pity these two frames are so far apart.

SIR H. TRUEMAN WOOD.—Sir Frederick Bramwell announced last week at the Society of Arts that Mr. H. Trueman Wood is about to be knighted, and added that this was "a mark of honour from our Sovereign which I am sure no man has more thoroughly deserved than he has. The way in which he has carried out the duties of secretary since the death of Mr. Le Neve Foster must, I am sure, have been appreciated by our thousands of members, and the way in which he carried on those duties which he undertook of looking after British industries at the late Paris Exhibition deserves praise at all hands."

Notes.

Military authorities seem to be suspicious of photography. On no other ground can the curious fact of the entire absence of photographs of the interior of the Tower of London be explained. A few days ago we strolled through the interesting building, and on arriving at the Beauchamp Tower enquired whether any photographs could be obtained. The answer was in the negative. In justice to the sturdy yeoman of the guard who was in charge, we are bound to say that he was rather hazy on the subject, as he seemed to think that the etchings he had on sale would answer our purpose as well as photographs. But this was excusable, as it was impossible for him to express an opinion on what he had never seen, and, so far as we could discover, the interior of the room in the Tower so full of pathetic records has never been photographed.

This seems a strange piece of indifference or neglect. On the walls, carved by their own hands, are the names of prisoners whose lives—or, to put the matter correctly, whose deaths—are part of the history of England. Surely no more interesting memento could a visitor carry away than such a *fac simile* as photography could give. Even as a question of profit, the walls are worth photographing. If a description of the writings on the walls can be sold, why not also photographs? There is not an American visitor—and they can be numbered by scores—who would not purchase a photograph of the word "Jane," so deeply indented by the unfortunate ten days Queen of England. As for the other objects of historical interest in the various parts of the Tower, their name is legion, and yet not a photograph is purchasable. It sounds incredible, yet it is the fact. We do not know who is the responsible authority, but if it rests with the Constable, perhaps the newly appointed official, Sir Daniel Lysons, will take the matter into consideration.

Whatever the result may be, what is known as a "boom" has set in with regard to penny photographs. The parent Automatic Photograph Company has the capital it asked for, and on the strength of its success has floated a more extended scheme for the purchase of its foreign patents, for which it modestly asks a quarter of a million. Meanwhile one of those ingenious persons always ready to follow somebody else's lead, has spotted a weak point in the original undertaking—the omission to make any mention of artificial light, without which the use of the machine is restricted to the daytime—and has brought out a rival company, one of the features of which is that provision has been made under the patents to apply the electric light automatically. This company estimates the number of its customers at fifty per day, whereas the other one put the possible number at thirty. No doubt one estimate is as trustworthy as the other, but as both companies have taken great care not to invite photographers to give an opinion on the merits of the rival schemes, we do not know that we need trouble ourselves about the matter. If the public must speculate, they may as well speculate in photography as in anything else.

The highest price ever offered for a photograph was probably that which was mentioned in vain some weeks ago for the photograph of the plaintiff in a certain action. The theory of the defendant was that the plaintiff was the same person who achieved notoriety on the Continent some time since, but to sustain the theory, proof of identification was necessary. A hundred pounds was offered for a photograph, but the person who had one in possession refused to sell. An artist was then employed, and attended the court during the hearing of an appeal on some point of law. Unfortunately, he could only catch a glimpse of the plaintiff, and his sketch was a failure. Up to now sensitive plates are not equal to the subdued light of our law courts, or a detective camera would have been called into requisition.

The Americans are extremely fertile in their invention of photographic "notions." The latest freak of fashion is for a gentleman to send to the lady he admires a handsome box, which, when opened, shows a photograph of an aristocratic pair of ears, the back button-hole of an abnormally high collar supporting a closely cropped head, and a view from behind of a well-cut coat. Indignation is, of course, the first emotion raised by the receipt of such a portrait, and the young lady naturally seizes a piece of ribbon attached to the box with the intention of rending the unwelcome gift to pieces, when, at the first tug, the picture slides out of the box, disclosing another which shows the proper features of the young man, smiling, after the manner of his kind, at his mollified sweetheart.

It is not every sitter who is so indifferent to his personal appearance as represented in a picture as is the King of the Belgians. He was recently sitting to an artist, and, getting somewhat tired, expressed a hope that the work would be speedily completed. The artist replied that he was afraid he should be obliged to detain him a little longer. The King sighed and remarked, "You might finish me off in a couple of seconds or so." "How?" exclaimed the amazed artist." "By just drawing a large man with a big nose." This was undoubtedly an abbreviated way of describing his appearance, yet, judging by the Belgian postage stamps and the Belgian coins, it was sufficiently accurate.

But monarchs must, after a long course of photographers and artists, grow somewhat callous as to how they look. As each photographer and each painter gives a different rendering of the royal features, the only interest the sitter must have in the subject is how he or she will be turned out at the hands of the new man. In fact, crowned heads at times must get a little mixed as to what is their exact appearance and expression.

The West-End photographers have been exceptionally busy on the occasion of the recent Drawing-Rooms in photographing the *debutantes*. It would be exceedingly convenient if the Queen would have a studio fitted up at Buckingham Palace, so that ladies could be photographed in all their freshness as they arrive. To array oneself for the ceremony, and to put on one's dress, train, and feathers for the photographer the next day, is not quite the same thing. Somehow, all the spirit and "go" of the affair evaporate. Her Majesty is a great collector of photographs, and why not add to her interminable list of albums a "Drawing-Room Album," to contain such portraits of the ladies presented to her as might be available? It would probably mean an extensive studio and a large staff of artists, but it need not cost the Queen a single farthing. There are plenty of enterprising firms who would undertake the task, provided they were not hampered by Court routine or restrictions.

In more than one instance we have recently noticed with satisfaction that ethnographical science is finding out the value of photography. At the Stanley Exhibition are several pictures which give a good idea of the natives of different tribes—what manner of men they are, and how they occupy themselves. We have all read much about Africa and its inhabitants of late months, but these photographs tell us at a glance much more than we can glean from any written description. One photograph, showing how the huge tusks of ivory are carried from the interior of the country to the coast, is especially interesting. The poor natives have evidently yet to learn how to keep still and look pleasant, for they have done neither the one nor the other, some of the figures being very indistinct in outline; but as they are somewhat deficient in clothing, a little fuzziness is not a matter for regret.

But at our more permanent ethnographical collection at the British Museum the value of photography is also recognized, for several fine enlargements from pictures taken at New Guinea by Lindt, of Melbourne, have recently been hung on screens. These pictures measure about 42 by 36 inches, and if we remember rightly the originals of some of them were shown a few years back at one of the Pall Mall exhibitions. One picture of a chief's house, supported on rough piles above water, is most interesting, as showing a lake dwelling of to-day, resembling those of ancient times, the remains of which have been so often found in Europe. A group of children—little black imps—is huddled together on a platform in front of the house, just as we see the small monkeys at the Zoo crowding together on a cold day.

Some other photographs in the same gallery seem, by their yellow tint, to be of older date. These are portraits of Kaffirs, some of which exhibit a remarkable form of head-dress, which looks like a tall cap covered with astrachan and with a plate on the top. But this is, in reality, no cap at all, but is formed by the natural growth of the hair, or rather wool, which is clipped all round like a well-kept hedge, and is crowned by a ring made of palm leaves, which is covered with vegetable wax and polished up with charcoal until it rivals in the splendour of its shine the domestic fireplace of civilisation. There is an old saying that "one half the world does not know how the other half lives." It would seem that photography is destined to be of great service in supplying part of the required information.

Those who still make oxygen gas—and their number must have been greatly reduced since the Brin Company have supplied it in cylinders at such a cheap rate—will be interested in a letter which appears in the *Scientific American*, in which the writer asserts that he has for some time discarded the use of manganese for admixture with the potassic chlorate, and has substituted for it carbonate of iron. There is probably some confusion here, for carbonate of iron is the crude iron ore, occurring either as spathose, or, in a more impure form, as clay ironstone. This, under the action of heat, is changed to ferric oxide. The red oxide has long been used in association with potassic chlorate for oxygen making, and if this substance is intended, there is nothing new in the suggestion. If, on the other hand, the clay ironstone is meant, impurities would be likely to be introduced into the retort, which might lead to serious accident.

It is evident, from reports reaching us from many sources, that eikonogen as a developer is fast finding friends among both professional and amateur workers. From our own trials of it we believe it to be more valuable for portraiture than for any other branch of photography, and for the reasons that the contrasts which it affords are soft, and that the colour of the deposit lends itself admirably to the inevitable retouching pencil. Amateur workers who have been used to obtaining vigorous landscape negatives with pyro and ammonia generally fail in their first attempts at portraiture, because they aim at a density which blots out all the finer lines and expressive markings of the face. With eikonogen they can hardly fall into this error. It gives an image like a ferrous oxalate developed plate at its best, and works with far greater certainty of result. We all know that on the Continent almost exclusively, and in some of the principal studios in this country, the ferrous oxalate method has for a long time been the standard system of development for portraiture. Eikonogen seems likely to usurp its place.

The French Exhibition, like most other large exhibitions now-a-days, was far from complete on the opening day, and half consisted of packing cases. In about another week it will be in a fairly advanced state. The Exhibition consists largely of fancy articles, in which the French display their acknowledged high level of artistic excellence and refined taste.

FICTION IN PHOTOGRAPHY.

A PRETTY and pathetic story was told many years ago—at a time, indeed, when photography was a mere infant—in the *Family Herald*. A certain honest peasant woman, known as "La Veuve Yvonne," living in a little secluded village in Brittany, having heard of the marvellous powers of photography, determined to visit Paris to test its merits after a fashion of her own. Arriving at the capital, she inquired for a photographer, and visited his studio. "I wish," she said, "for a portrait of my child." "Certainly, madam; have you brought the child with you, or shall I call upon you?" "Neither," replied La Veuve Yvonne: "they tell me you are very clever in making children's portraits." "I succeed pretty well," said the photographer; "but when they are exceptionally restless."—"My child will not trouble you with his restlessness." "Ah! then," replied the photographer smiling. "I am pretty sure to do well." "My child," she continued, "is dead." The photographer ceased to smile. "You want a picture of him before he is buried." "He has been dead and buried for five years." "What!" said the surprised artist; "you have, then, a picture of him." "If I had," replied the widow, "I should not be here." The photographer told her kindly that what she requested was impossible. "Impossible!"—and the widow's countenance fell—"they told me that photography could work miracles." A sudden thought sprung from the kind heart of the photographer, and illuminated his brow. "You have still your child's clothes, madam?" "Yes. I made them for him myself." "How old was he?" "Six years." "The colour of his hair?" "Golden." "He was a good boy?—you will forgive my inquiries." "He said his prayers every night at my knee." "Pardon me for asking all this," said the photographer to the weeping mother. "You shall—yes, by the help of heaven—you shall have his portrait. In a couple of days come to me again." The widow came, and received the first proof. "It is he!" she cried with a mother's happy love, "it is my son. He wears the little boots I got for him from neighbour Dubois. This is his little coat with the pearl buttons, which I sewed on with my own hand. Ah! and that is his long, bright, golden hair. Oh! monsieur, what shall I pay you for this?" "Madame," replied the photographer, "photography, you have been told, can work miracles, and miracles are never paid for."

Dame Yvonne returned to Brittany, and remained till the day of her death convinced that the portrait she had placed over her cottage bedstead was the portrait of her dead child.

The good photographer had dressed a small child of his own in the boy's Breton costume, and had represented him in a kneeling attitude, his head bent, and his face hidden by his hands, clasped together in the humble attitude of prayer. On a deceit of this kind, as on the celebrated oath of Uncle Toby, the recording angel, while inscribing it in the book of human actions, surely dropped a tear, blotting it out for ever. That celestial being, indeed, seems to have inspired the mother with a reply to all the doubts and cavils of inquisitive neighbours. "Why," said one of these, "does your son hide his face thus in his hands?" "Ah!" replied La Veuve Yvonne, "you must be a bad Christian indeed to ask that. The little angel in heaven is praying for me, his poor old mother, who is left in the world alone."

Even religious stories have been suggested by photography. But they seem not to have been a commercial success. A little volume containing them, entitled the "Photographer," was discontinued after the second number. These stories present a melancholy reflection of Bunyan. The camera appears not to lend itself kindly to the purposes of conversion. In one tale we are told that the three brightest features in the Christian's countenance are Faith, Hope, and Charity. So far, indeed, as faith is the evidence of things not seen, the photographic comparison is happy. The protagonist of another tale is asked, "Do you perceive your faithful likeness? Does your countenance appear hopeful? Is your charity sufficiently in shadow? Is your body full of light? Is the light which falls on you unsteady? Are you endeavouring to look cheerful, or are your features rigid and harsh?" Dismayed by these enquiries the protagonist endeavours to escape, but the photographer adjures him not to run away, to let him look again at his general appearance, and finally adjourns the sitting to a time of increased light.

The preceding stories were all told in prose. The following was originally composed in rhyme. A young officer, cornet Fitz Sparrow, in the Aldershot Blues, "stood four feet six in his shoes," and his diminutive stature was to him a source of enduring shame and sorrow. He forgot, or never knew, apparently, the moderate statures of those military heroes, those thunderbolts of war, Nelson and Napoleon. It was in vain that he mixed raw eggs and brandy and drank the compound: it was in vain that he wore the tallest top hats he could find; it was in vain that his bootmaker, by the aid of cork heels carefully concealed in his boots, thought to accomplish the unaccomplishable. No man, we have it on the best authority, can by taking thought add a cubit to his stature, and that was exactly what cornet Fitz Sparrow attempted to do. The brandy gave colour to his nose instead of length to his legs; the tall hat made him look top heavy; the high heels went before a fall. And cornet Fitz Sparrow was so anxious to marry, but every maiden said him nay. At last he resolved to advertise. "Wanted, a Wife."

A dozen answers were sent to his advertisement, but every one of the applicants desired his carte-de-visite. This request, which would betray the smallness of his stature, he felt to be a death-blow to his hopes. However, he went to a photographer—a cunning artist—who assured him he could give him the appearance of a giant. Fitz Sparrow was in raptures when the photographer, by the aid of a child's table and chair placed close to the cornet, gave him the size of a modern Goliath. He immediately forwarded a dozen copies of his carte to the dozen applicants, and they appointed a dozen meetings at a dozen different times and places. Alas! one by one they came, saw, and, disgusted by the lowness of his bodily frame, left him; all save one, the twelfth, a little fairy, who whispered in his ear, "Oh, I am so glad; I was so afraid you were too tall." It is needless to give much more of this rhymed story. They married, and, being both short, kept each other in countenance in more senses than one, and were happy; and ever afterwards, Cornet Fitz Sparrow, though he only "stood four feet six in his shoes," stood, in his own estimation, five feet ten at the very least.

MR. F. P. CEMBRANO and Mr. J. B. B. Wellington are now in Stockholm, after a hand-camera excursion up the Rhine, down the Danube to Vienna, then to Oberammergau and the Passion Play, thence to Copenhagen.

REMARKABLE NOVELTIES IN PHOTOGRAPHIC INSTRUMENTS.

Last Wednesday night, Mr. J. A. Rudge, a scientific instrument maker of Bath, exhibited to the Bath Photographic Society a new optical lantern, with mechanism attached, to represent, by means of a series of photographic slides, men and other animals moving as in life. The first instrument of this kind was exhibited a few years ago to the Photographic Society in London by Mr. Friese Greene, who informed the meeting that it was invented by Mr Rudge, of Bath. It consisted of a lantern with one condenser, and four small projection lenses, each receiving light from the lamp through a separate part of the condenser. A rotating opaque disc was so shaped that before one image—say of a face—was entirely cut off from the white screen, the next image was imposed upon it, so that the one gradually melted into the other. In this way the face could be seen changing from grave to gay, and so on, and the very twitching of the skin of the face could be seen. Mr. Greene heightened the effect by painting the gelatine negative with cobaltic and other salts, so that, as the slide grew warm from the heat of the lantern, colour gradually appeared in the face and dress. The effects were, from an entertainment point of view, vastly superior to those produced by Mr. Muybridge and others by application of the thaumatrope principle, the unpleasant jerkiness of which is well known. Mr. Rudge's lantern was defective in several ways, and, among others, in the small sizes and numbers of photographs it could take in one series.

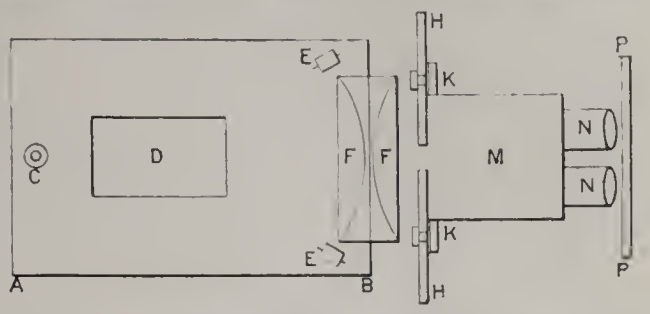
Later on Mr. Greene brought out an invention upon the same lines, and had an instrument constructed consisting of three lanterns, by which means he was able to bring the full power of one condenser to bear upon each slide exhibited; the instrument also included some costly mechanism for automatically bringing a long series of twenty or more slides into play. Practically, like most new inventions, it was defective, and, for want of sufficient adjustment beforehand, was far from doing its best work when exhibited before the Photographic Society. Since then considerable improvements have been made in the instrument, but at present they are not for publication. Mr. Chang, the Secretary to the Chinese Embassy, had a private view of the whole machine at work a few days ago, and was much interested therein.

Lanterns of this class necessitated the taking of photographs in rapid succession—that is to say, several in the course of one second of time—and that led to the invention by Mr. Greene and Mr. Mortimer Evans of the camera for giving ten or even more exposures a second.

Quite recently, as published in these pages, Mr. C. V. Boys has invented and used a machine for taking one hundred or less of photographs per second, when the object is sufficiently self-luminous, or illuminated.

The next public step in this eventful history took place last Wednesday night at Bath, when Mr. Rudge exhibited to the Photographic Society there a new instrument, which may be explained by the aid of the accompanying diagram.

In this diagram AB is the lantern, pivoted at C to permit a small front motion, of which C is the centre; D represents the position of the lamp and chimney; EE are rollers to facilitate a little right and left motion of the front of the body of the lantern, from which the parts in front of the condenser FF are detached; HH are two discs, on each of which six photographic portraits of the same person are printed; the discs rotate upon their respective pivots KK. The large tube M carries two smaller tubes NN, in which are mounted lenses which



swivel in any direction, and can then be clamped. PP is a moving shutter.

When this machine is in action, the front of the lamp, and the condenser thereupon, are constantly moving either to the right or to the left; this enables a smaller condenser to be used than would otherwise be necessary, and tends to equalise the illumination on the screen during the changes in the image. The discs and photographs resemble those obtained with Stirn's camera, but are of larger size; the apparatus used with the lantern is also employed when taking the negatives, so that when the latter are printed as positives on another circular sheet of glass, they are certain to be in true register. The greatest difficulty in making this class of instruments consists in obtaining perfect registration everywhere, so the mechanism must be perfect. The next greatest difficulty is in obtaining equal illumination of the projected images during their changes. The machine exhibited by Mr. Rudge last Wednesday night was not quite finished, and as the positives were not ready, he had to employ negatives instead; it served, however, to explain the principles involved. He is making this machine for Mr. Greene.

The instruments already mentioned are probably the heralds of the dawn of a new branch of photography, the ramifications of which no one can foresee. We once published that the power of taking and of printing negatives with immense rapidity brings us several steps nearer the greater use of photography as a means of publishing news and of bringing out of books. Mr. Boys has already found such appliances necessary in one branch of scientific research. Mr. P. Braham told the meeting on Wednesday night that crystals in the incipient stage of their formation do not grow slowly, but shoot out all at once, consequently such instruments may possibly reveal the details of this scientific phenomenon, and show how crystals grow in their primary stages. Of the value for historical purposes of such instruments, when perfected, Mr. Friese Greene wrote in the last Year-Book.

Yesterday morning we called, with Mr. Friese Greene, upon Mr. W. M. Ashman, whose skill in practical photographic work is well known. His studio faces the south, so is glazed with ground-glass, and in hot weather, by turning a tap, he can let a thin sheet of water flow down the whole surface of the roof; this, he says, makes the whole studio beautifully cool in about ten minutes. Of course the evaporation of water has a powerful cooling effect. He uses homely furniture as accessories in photographic work, and has striped tinted blinds, instead of white ones, so that the whole studio has a little more than usual the appearance of an ordinary room.

THE PHOTOGRAPHIC SURVEY OF WARWICKSHIRE.

A MEETING of those interested in the Warwickshire Survey was held at St. Edmund's College, Birmingham, on Thursday, May 22nd, the Mayor of Sutton Coldfield, with Mr. J. B. Stone, F.G.S., in the chair. There was a numerous attendance of the members of the Birmingham Photographic Society, together with representatives from the Vesey Club, the Municipal School of Art, the Coventry Photographic Society (Mr. F. W. Dew), the Philosophical Society, and others. Letters of apology were read from Messrs. S. Timmins, Richard Tangye, Surgeon-General Ranking (President of the Leamington Photographic Society), H. W. Jones, F.C.S. (Vice-President of the Coventry Photographic Society), A. E. Donkin (Rugby School), H. R. Lloyd (Birmingham Archæological Society), Professor Poynting (Mason Lodge), and others, all giving their approval to the survey, and promising to help in the work.

Mr. Stone said that the object of the meeting was to organise a County Survey Council which should take charge of, organise, and carry out a survey of every object of public interest in the county of Warwickshire. The survey would include photographs of buildings—ancient and modern—of ancient manuscripts, of paintings, of objects of geological and botanical interest; it would, in fact, form a record which would enable future generations to have some idea of the state of the county as it existed in the latter part of the nineteenth century. He referred to a letter which had been received from the secretary of the Birkenhead Photographic Association, claiming originality for the idea of making a photographic survey. There could be no originality in the idea, for it had been carried out—after a fashion—many times. He had himself made what he supposed the Birkenhead Society would call a photographic survey, by photographing all the old buildings in the hundred of Hemlingford, quite a quarter of a century ago. But the survey which Mr. Jerome Harrison had proposed, and which they were prepared to carry out, was something of an altogether different nature. He proposed "That a County Photo-Survey Council be created for the purpose of organising a complete photographic survey of Warwickshire; such council to consist of elected representatives from the various photographic societies in the county, in the proportion of five per cent. of the members of each society, together with two representatives from each of the scientific, literary, and artistic societies in the county; that the council shall have power to elect co-optative members, and shall appoint public trustees for taking charge of the records obtained."

The motion was seconded by Mr. W. Jerome Harrison, F.G.S., who said that he heartily welcomed the presence on the survey of the scientific and artistic workers whom he saw present. They could lend great aid in drawing up lists of noteworthy objects to be photographed. He trusted that Mr. Bagnall, whose "Flora of Warwickshire" was on the eve of publication, would at once supply them, for example, with a list of famous trees within the county. Mr. Jethro Cossins, the eminent architect, had promised help with the churches. It would be part of their first work to obtain information as to the thousands of valuable negatives which were already in existence.

Mr. W. Buncher (School of Art) hoped the council would take into early consideration the question of publication of a selection of the results obtained. He thought that a thousand subscribers to such a work could be obtained with ease.

Mr. F. W. Dew (Coventry) promised hearty co-operation in the work, and spoke of the great alterations which had been made within the last few years in the churches of Coventry. He had many valuable negatives of those churches before their restoration.

The motion was carried unanimously.

The Chairman proposed, Mr. S. G. Mason seconded, and it was carried unanimously, "That the first co-operative members should be appointed at that meeting; that they should retire at the end of the current year, when the council shall proceed to elect other members to fill the vacancies, the retiring members to be eligible for re-election."

The last resolution, which was put from the chair, seconded by Mr. Jethro Cossins, and carried unanimously, was "That the photographic and other societies of the county be requested to at once elect their representatives, and that the first meeting of the new council be called for June 12th."

Notices of Books.

THE AMATEUR PHOTOGRAPHER'S LIBRARY, Nos. 2, 3, and 4. (*Hazell, Watson, and Viney, London*, 1890.)

THESE are three recently issued little volumes, each dealing with special subjects of interest and use to photographers, especially to beginners.

CAMERAS, LENSES, AND SHUTTERS.

"Cameras, Lenses, Shutters, &c." is the title of No. 2 of the series, and consists of a number of articles by different authors who have given special attention to the subject. The first article in the book is on "Cameras," by Mr. W. V. Corbet, who, after a few practically useful remarks about tripods, says:—"A plain screw and a flat camera bottom offer a ready means of revolving instrument, at same time abolishing horizontal front, and lessening weight and complication. It will now be seen that revolving heads and horizontal fronts are not wanted." This is an example of the slipshod composition pervading the article of often leaving out the word "the" where it ought to have been inserted, and contains error as to a matter of fact. No revolution of the camera on its axis will bring an imaginary line, passing through the centre of the lens, away from the centre of the plate and nearer to one or other of its edges; the horizontal front enables this to be done, and with certain subjects, and when using lenses with a not very flat field, gives optical advantages not otherwise obtainable. When using a portrait lens, to take instantaneous photographs in places where the light is not good enough to permit the use of a doublet, sometimes the view may be such as to cause a horizontal front to become a welcome appliance. The rest of the article contains some useful suggestions.

Another article on the same subject is by Mr. John Powell, who deals with the subject of camera-legs with considerable critical ability, showing that the legs of cameras deserve more scientific attention than they have hitherto received. At present they are made too much by rule of thumb, so far as obtaining the maximum rigidity with the minimum weight of wood is concerned, so that the photographer is often carrying more wood than is necessary to obtain the same amount of rigidity. Some of Mr. Powell's valuable utterances on this subject are here quoted:—

> There is one important factor which seems to have been entire overlooked, viz., that with the same cubical dimensions—in other words, the same weight of timber—we can obtain greater rigidity. Viewing the ends of most tripods, we note that the pieces are approximately square, that the breadth and depth are nearly similar, instead of being *long rectangles*. Let us take two examples, one of the former and one of the latter, and consider their respective comparative strengths:—
>
> | | Breadth. | | Depth. | | Content. |
> |---|---|---|---|---|---|
> | No. 1. Approximately square section, in eighths of an inch | = 5 | × | 6 | = | 30 |
> | No. 2. Long rectangular section, do. | = 3 | × | 10 | = | 30 |
>
> In the first case, the breadth is assumed as $\frac{5}{8}$ in., and in the second case as $\frac{3}{8}$ in. Now, under a cross strain the strength is proportional to the breadth, so that No. 1 : No 2 : : 5 : 3, that is, No. 2 is only $\frac{3}{5}$ of the strength of No. 1. Next, in the first case we have taken $\frac{6}{8}$ as the depth, and in the second case $\frac{10}{8}$. Now the depth is most important. The strength varies as the square of the depth, so that in this respect No. 1 : No. 2 : : 36 : 100, or in other words, No. 2 is nearly

three times as strong. Lastly, combining the former and latter calculations, it will be found that No. 1 : No. 2 : : 180 : 300, or that No. 2 is nearly double the strength.

Further, as already stated, the ratio of length to depth in No. 1 would be 64 to 1, whereas in No. 2 it would be 38·4 to 1, a considerable advantage.

Again, the clear space between the joints would be, say, 15 ins. Hence the ratio of length to breadth, that is, 15 to $\frac{3}{8}$ in., would be 40 to 1. Further, as this only applies to one part, and that part could not buckle under ordinary circumstances without the pair being similarly affected, it is manifest that it is fully equal to the other proportions, the only disadvantage being the formation of a rectangle with the joint pins, which would be somewhat dependent on a sound, well-finished joint. To this, however, both are comparatively dependent for rigidity.

Mr. Powell also considers the first principles of construction to secure the rigidity in the camera, which in theory should be so affixed to the tripod that the centre of gravity of the camera is below its support. He suggests a camera constructed upon these principles, and describes it by means of diagrams, but as the diagrams do not appear in the book, having been omitted apparently by accident, readers are not in a position to criticise the details. Apparently the camera is fixed below the head of the stand. The author says :—

> The advantages, briefly, may be summed up as follows :—
> 1. The legs practically meet at a point.
> 1. The camera is in stable equilibrium.
> 3. It dispenses with the use of a level.
> 4. The line of sight is always normal to the plate.
> 5. It presents the least equivalent area of pressure to the wind, which, other things being equal, is a decided advantage in form over the pyramidal, as the latter is over the square or rectangular form.

Mr. Powell, in dealing with the subject of conical *versus* square bellows for cameras, gives his verdict absolutely in favour of conical bellows, chiefly because, when open, they present less wind surface. This is the most questionable part of his excellent article. When the camera is of long range, which is the case with the most serviceable instruments, conical bellows are apt, under certain circumstances, to cut off a part of the image when the operator is using the rising or falling front ; various devices exist for overcoming this defect by gathering together and fixing some of the folds of the bellows, but it would be more convenient were no such devices necessary.

A third article on "Cameras" is by Mr. J. H. Taylor, who says that he prefers plumb levels to spirit levels for cameras : the former, however, are more in the way of the operator. A level of any kind is scarcely necessary, where buildings are in the field of view, to give truly perpendicular lines as a guide in focussing, but in some mountainous regions, with no vertical straight line in view, and the legs of the camera erected on a bank sloping like the roof of a house, the photographer soon discovers the value of levels for special purposes. A fault in many of the levels now sold for photographic purposes is that they are too sensitive ; were they less so, within certain limits, they would be easier to use, and no practical disadvantage would creep in. Mr. Taylor speaks of the large per centage of defective photographs obtained from one cause or another in the use of hand-cameras, and recommends that whenever possible they should be used on the top of a light stand. This advice is good for those who care for quality rather than quantity.

Next come some papers on lenses. The first, by the Rev. T. Perkins, gives some of the optical principles at the root of the construction of lenses. Towards the close the author says :—

> Half a doublet forms a landscape lens which will work with about $f/23$ or $f/32$; in many of Ross's rapid symmetricals, the two combinations are of different foci, and as either will screw on the back of the lens tube, two different singles may be obtained. A doublet of intermediate focus may be obtained by removing the back combination, and replacing it by the back combination of a doublet of longer focus. Ross's portables may be thus used. It is well to have a cap to fit each end of the lens tube. Dust is thus excluded, and the lens protected from injury. But, despite all care, dust will find its way to the glasses ; to remove it, dust with a camel's hair brush, then wipe with chamois leather, or a soft silk handkerchief kept, when not in use, in a broad-mouthed stoppered bottle. A little pure alcohol may be used to remove stains that the dry leather will not remove. The lenses, when not in use, should be kept in a case with a division for each, or put away in a box, each lens being placed in a bag of chamois leather.

Mr. J. H. Hargrave gives a paper on the same subject, so also does Mr. J. H. Taylor. The latter, on page 31, gives an elaborate description of a diagram, which diagram is not in the book. It is a good memoir.

The next article is by Mr. W. Groves on "Shutters." The roller blind shutter next the plate is theoretically the best for giving the largest amount of light in a given time. Mr. Groves says that its bulk is objectionable. This would not matter so much, especially as it forms part of the camera ; but its weight, as at present generally made, is against its general use. A remedy would be to substitute aluminium for brass in some of its parts. Mr. Groves says of this shutter :—

> Shutters used immediately in front of the plate permit the full power of the lens to act on each portion of the plate during the whole time the said portion is uncovered. By using a drop shutter or roller-blind shutter with a narrow aperture the width of the plate, it is probably possible to give shorter exposures and obtain sharper images of objects than with shutters in other positions. In the case of rapidly-moving objects the images obtained by these shutters are slightly bent or distorted, as will readily be seen when it is considered that the image is exposed bit by bit as it travels along the plate. This distortion may be reduced to a minimum by causing the shutter to travel in a direction opposed to that of the image. Variation in the exposure given to the foreground and sky may be affected as in shutters immediately behind the lens. Shutters in this position become very bulky for the larger sizes of cameras ; their exposure apertures have to travel over a large amount of space, and, as in the case of shutters immediately behind the lens, they require to be especially fitted to the camera. Shutters behind the lens are particularly adapted for hand or detective cameras.

The next article on "Shutters" is by Mr. J. H. Taylor, and the third by Mr. Louis Meldon, whose objection to the roller blind shutter next the plate we think to be stated in too strong terms, and that its utility is far above his estimate. Mr. Meldon gives the following table of the rapidities of different shutters, but does not state who made the experiments, nor how the measurements were made, and the latter is a point of vital importance :—

> The following is a list of the rapidities shown by certain shutters, which may be of some little use in affording an approximate idea of what may be expected from them :—

	Second.	
Drop Shutter	$\frac{1}{15}$	Aperture, $2\frac{1}{4}$ sec.
„ „	$\frac{1}{50}$	„ $\frac{1}{4}$ sec.
Newman's	$\frac{1}{15}$	Whole-plate.
The Plunge	$\frac{1}{5}$	Quarter-plate
„ „	$\frac{1}{11}$	„ „

Watson's Double Snap ...	$\frac{1}{20}$	Whole-plate.
Phantom	$\frac{1}{12}$ to $\frac{1}{33}$	„ „
„ sky	$\frac{1}{100}$	Quarter-plate, double bands.
„ foregrouud ...	$\frac{1}{40}$	
Cadett's Lightning : sky ...	$\frac{1}{33}$	Whole-plate.
„ „ foreground ...	$\frac{1}{25}$	
Wollaston's Diaphragmatic ..	$\frac{1}{25}$	Whole-plate.
Robinson and Son's (go and return) foreground	$\frac{1}{15}$	Half-plate.
„ „ sky	$\frac{1}{22}$	
Lancaster Instantograph ...	$\frac{1}{15}$	Half-plate medium band.
Kershaw	$\frac{1}{17}$ to $\frac{1}{60}$	Whole-plate.
Grimston ... ... up to	$\frac{1}{23}$	Aperture $1\frac{3}{4}$ ins.
Meldon (as made by Perken) „	$\frac{1}{300}$	„ $1\frac{1}{4}$ „
Caldwell (as made by Wray) „	$\frac{1}{200}$	„ „ „
Thurey and Amey ... „	$\frac{1}{300}$	„ „ „
Mr. P. Lange's	$\frac{1}{77}$	„ $1\frac{1}{2}$ „

The next article is by Mr. L. A. Burrow on "The Sensitive Medium," in which the author deals with emulsion making. He says that with iodide of silver alone in emulsion the image is dense, but there is little detail in the shadows or high-lights. But has the best method of preparation, or vehicle, or mode of development for iodide emulsions yet been discovered? It may be remembered that Sutton and a few others stated that iodide of silver is more sensitive than the bromide in the wet collodion process, but necessitates greater attention to the purity and condition of the nitrate bath.

Mr. W. P. H. Foster contributes an article on the same subject, so also does Mr. J. A. Randall. The latter puts forward the following pleas for the use of slow plates, except where quick ones are a necessity :—

Before preparing an emulsion, it must be decided whether it is to give rapid or slow plates. The difficulty of making a good emulsion increases as means are taken to gain rapidity ; whereas to prepare a slow emulsion is a certain and comparatively easy matter. The film of a plate coated with a slow emulsion is of an orange colour, and much denser than the film of a quick plate ; for this reason halation is not so likely to impair the quality of the finished negative. With a slow plate a degree of richness can be obtained that is not so often seen in a rapid plate. There is a certainty connected with slow plates, and an amount of comfort in working, which cannot be equalled with rapid plates. They can be developed in a light which adds considerably to this comfort and certainty of result : the plates being more manageable, whilst developing the latitude of exposure is much greater. For fleeting effects in landscapes, instantaneous views, and moving subjects, a rapid plate is, of course, necessary, but when it is not a matter of time in exposure, no advantage can be gained by using an extra rapid plate.

The Rev. T. Perkins, M.A., contributes an article on "Exposure," at the close of which he says :—

Many photographers find a difficulty in timing exposures. Wishing to keep their eyes on the subject during the exposure, in order that they may re-cap the lens even before the full intended exposure has been given should anything suddenly move and so irretrievably ruin the picture, they cannot keep their eyes on the second hand of their watches ; but I always count seconds in the following manner, and by it I can count even a minute with an error of not more than one or two seconds : I repeat as fast as I can as many letters of the alphabet as I find from experience I can say in a second, thus, "a b c d e f, one ;" "a b c d e f, two ;" and so on up to ten seconds ; then I begin a second set until the requisite number of seconds is completed. A little practice is all that is required to gain great accuracy by this method, the first idea of which I gained from Professor A. S. Herschell, who used a somewhat similar plan to count the time of the flight of meteors across the sky ; and I should advise its use for exposures not exceeding twenty or thirty seconds—for longer exposures a watch is more convenient.

Mr. W. A. Watts, M.A., also contributes an article on "Exposure."

Finally, the book closes with three articles on "Development," by Messrs. H. E. Murchison, F. T. Bennett, and W. A. Watts. Subjects which should meet with more attention in a future edition of this useful little work are finders, focussing-glasses, focussing screens, and something about eikonogen, for, although the book is dated 1890, there is nothing in it about the latter developer.

For the notices of the other two books of the series, space cannot be found this week.

Anleitung zur Photographie fur Anfanger. Von G. Pizzighelli. (1890. *Knapp, Halle a S.*)

This work, which is not bulky, although containing 200 pages illustrated with over 100 woodcuts, professes modestly enough to be an introduction to photography for the use of beginners. It will certainly serve this purpose, as each subject is taken from the beginning, and explained in a way that is calculated to make it understood by those who have not had previous instruction in photography. It is, however, so thorough in the treatment of the subjects included in its scope that it may well take place as a manual not for beginners merely, but for reference on the part of the amateur, and even of the professional photographer. We have seldom met with such a trustworthy and, so far as it goes, complete handbook in so small a compass as is presented in the present volume by the well-known writer and experimentalist, Captain Pizzighelli.

Patent Intelligence.

Applications for Letters Patent.

7,764. D. J. Playfair, 87, St. Vincent Street, Glasgow. "Obtaining Cyanides and Ferricyanides."—May 19th.

7,842. J. Hines, E. Howell, and H. Howell, 96, Buchanan Street, Glasgow. "Automatic Photographic Machines."—May 20th.

7,850. J. B. Birkbeck, 12, Primrose Hill, London. "Producing Optical Illusions."—May 20th.

8,099. S. H. Burchell, 37, Chancery Lane, London. "Cameras."—May 23rd.

8,139. J. Ralph, Prince's Chambers, Wolverhampton. "Photographic Albums."—May 24th.

8,151. W. P. Thompson, 5, Lord Street, Liverpool. "Cameras." May 24th.

8,160. J. P. Bayley, 18, Fulham Place, Paddington, London. "Photographic Burnishing Machine."—May 24th.

Specifications Published.

9,312. *June* 5th, 1889.— "Photographic Box Cameras." George Charles Inkpen, Architect and Surveyor, 12, Havelock Road, Southsea.

The construction of box cameras, the means of releasing the exposed plates, bringing forward fresh plates and storing them after being exposed, also the construction of the lens shutter and means for opening and closing same.

The camera consists of an oblong box with raised platform each end. On the back platform the plates are placed in vulcanite sheaths and held in position by india-rubber bands, and are pressed up to the front by means of a coil spring. The lower edge of the sheath is caught in a catch and the upper part by a lever worked from the outside of the box, which, on being moved alternately to the left or right, correspondingly passes over notches in the vulcanite sheaths, and releases the

plates, which fall upon a roller covered with india-rubber, and are afterwards passed and collected together beneath the platforms at each end of camera. The front platform carries the lens of the ordiuary type, and the focus can be regulated from the outside. The shutter consists of two vulcanite discs, fixed on a centre, attached to a base board, and haviug a drum with two cords wouud upon it. The pulling of the cords alternately causes a corresponding movement of the discs, which, in passing over the lens aperture, opens and closes the lens.

The inventor claims :—

1st. The ueans by which a plurality of plates, films, or other sensitised media, arranged one behind the other in a camera, are released in succession, removed from the field of the lens, passed into a depository chamber, and retained there in such a manner as to prevent them falling forward so as to obstruct the field of the lens, as substantially set forth.

2nd. In providing a back of thin vulcanite, or other suitable material, with projecting edges, as a carrier behind the plates or films, and securing the two together by means of elastic bands, preferably placed towards the ends of the carrier, which also prevents the sensitised surfaces being damaged, as substantially set forth.

3rd. In cutting notches in the projecting edges of the carriers above-mentioned in such a manner as to be alternately placed when a number of carriers are arrauged in succession one behind the other, and a sliding bolt or other similar ueans which, by engaging with the projecting edges of the carriers, causes the catch or catches of the bolt to release its hold on passing the notches or slots in the upper edge of the carrier, and allows one carrier with the plate or film to be expelled from the platform, whilst the plate immediately behind it is secured by the bolt and carrier, as substantially set forth.

4th. The arrangement of the sliding bolt and the lever which imparts a movement to it actuated from the external case of camera ; also the capability of the lever being connected to the mechanism of a lens shutter so as to set it and reset it, as substantially set forth.

5th. One movement alone is required to reset the shutter and release a carrier with plate ; the action being simultaneous, it follows that it is impossible to take two views on one plate, as substantially set forth.

6th. Exhibiting the number of the carrier by a sliding register visible from the outside of camera of a corresponding number to that placed on carrier, as substantially set forth.

7th. In providing a platform in the body of the camera, on which are placed one or more rollers, covered with india-rubber, to break the fall of the carrier with glass plate or film when expelled from the platform, protect the sensitised surface, and conduct the carrier to the depository chamber, as substantially set forth.

7,522. *November 4th*, 1889. — "Photographic Apparatus." VICTOR JULES EMILE DAMOIZEAU, 17, Rue St. Ambroise, Paris, Gentleman.

This invention relates to the construction of photographic apparatus which is capable of taking in any desired angle or even the entire horizon, for producing panoramic views for plans, landscapes, and the like.

The inventor claims :—

1. The construction of a carriage with two racks worked by a common pinion, which permits the use of a lens of any focus, and insures an equal and simultaneous displacement of the camera and of the front.

2. The general arrangement and construction of the camera forming a magazine coutaining folded bellows, and capable of being taken off in one piece.

3. In the camera proper, the arrangement and use of cylinders and rollers aud lever which secure the regular rolling up and unrolling of the sensitive material, as well as the ueans for driving them from the motor which actuates the carriage at the same time.

4. In the camera described, the employment of two quadrants for determining the aperture of the diaphragm and regulating the time of exposure.

5. The combination with the camera described of a spring pricker for making the register-marks on the sensitive material, and of the counter constantly indicating the amount of the sensitive material that has been used.

6. The means for working the shutter simultaneously with the other parts, and for closing the same automatically when the carriage stops.

7. The construction of the front with slides for obtaining a horizontal and vertical displacement with a wide range of motion.

8. The special construction of the lens mounting, which forms one with the sliding front, and which is furnished with an opening to permit the lenses to be changed.

9. The synchronous moving of the optical centre of the lens, and the roll of sensitive material which is unwound at the back of the lens.

10. The addition to the extremities of the sensitive roll of black paper or fabric, or the like, which covers the sensitive material when rolled up, so that it may be withdrawn from the camera or placed in position therein in open daylight.

11. The general arrangements and combinations of parts constituting the improvements in photographic apparatus, substantially as described and illustrated by drawings accompanying the specification.

7,347. *May 2nd*, 1889.—"Photographic Cameras." RICHARD WILLIAMS THOMAS, 121, Cheapside, London, Artist.

My invention is principally designed for cameras for taking instantaneous photographs. I construct my improved camera with two lenses, and preferably in the shape of an ordinary field or opera glass—one side beiug fitted with a lens and focussing glass, and the other side being provided with a lens and also suitable arrangements for the dark slide and shutter. The two sides are joined together and worked backwards and forwards by means of a screw, as in an ordinary field glass, and the lenses in each side are so arranged that by movement of the screw both are focussed at the same time ; the shutter is connected with a catch or spring fixed or projecting to or near the wheel or thumbscrew, by which the screw is worked. By means of my invention the operator is able to see the object at the time he takes the photograph, and the risk of failure is thereby minimised.

10,319. *June 25th*, 1889.—"Supports for Photographs." HENRY JOHN MANSELL, 57 and 59, Golden Lane, London, Wholesale Stationer, and EUSTACE FRITH, of the firm of Frith and Co., Wray Park, Reigate, Surrey, Wholesale Photographic Publisher.

The object of the invention is to provide a cheap and readily applicable stand for photographs, cards, and other articles. The stand consists of a back-board to which is attached a shorter or lesser front-board, the two being hinged together. The extent of movement of the shorter board or limb is controlled by means of a band, cord, or attachment, which may conveniently consist of a doubled ribbon, the fold enclosing a ring at one end, which ring rests against a hole in the back of the board whilst the ribbon passes through it, but the ring cannot pass, on account of its greater size. The other end of the ribbon passes through a hole in, and is attached to, the shorter hinged portion. The photograph, card, or other article to be exhibited is cemented or otherwise secured to the short limb, and the back-board serves with the photograph or other article—such as opaline cabinet or other sized photograph—to which the shorter leaf may be attached, to form a steady support for the whole, and serving to hold the photograph up in a convenient position for exhibition.

19,897. *December 10th*, 1890.—"The Manufacture of Photographic Films." A communication from GEORGE EASTMAN, of Rochester, in the County of Monroe, and State of New York, United States. ALFRED JULIUS BOULT, 323, High Holborn, London, M.I.M.E.

Specification in our next.

THE June number of *Scribner's Magazine* contains an article on the "Emin Pasha Relief Expedition," which is illustrated with reproductions from photographs taken by members of the expedition.

Correspondence.

"UNHAPPY COLONIALS."

Sir,—Though I spent a good many years in England in graduating at Cambridge, and going to the Bar, I am a native of Tasmania. In my early days, I well remember the quality of wares imported into several of our Australian colonies. Anything was good enough for us, and if the articles imported were not up to the mark—well, the diameter of the world separated the English manufacturer from our wrath. In later times we have been better treated; but I want to tell you of a recent experience of mine with a box of —— whole-plates. As I cannot blame the local vendor, I may say that I got them from a well-known Melbourne firm—Messrs. J. W. Small and Co. I have long confined myself to this one make of plates; but in one of the boxes no less than five plates had a line clearly and cleanly cut through the film, which ran a photographic telegraph wire across my picture. I would enclose a print, did not the description appear plain enough. After two plates in succession treating me in this way, I expended the rest on views of the magnificent Derwent River at Hobart, taken from the garden of my brother, the Chief Justice of that colony.

Now, how about the next box of this make, which I place in my slides? As I take in and *read*, not only your paper, but another English one, as well as American, French, and German, and occasionally an Italian book, such as "Bettini's Fotographia Moderna," I deem it prudent to place my plates in their slides in absolute darkness. If it does no good, it can do no harm, and you can dust and insert without much trouble in the dark. But then these —— "lines" cannot be detected. I am familiar with the "D" line in the solar spectrum, but I felt seriously inclined to designate these happily unfamiliar ones as "D—d."

Now, I simply ask you, would this box of plates have been placed on the market in England? And was it not sold out here simply because we are helpless in the matter?

I would not have mentioned the name of the firm were not its wares so well established in the market that my complaints are necessarily and intentionally harmless. Moreover, the managers of the —— Company are probably unaware that defective plates left their establishment; nor do I want that company to forward me a box of their best manufacture to replace the defective box. I imported some of —— films from America; they developed with many spots. On writing to them to ask how to get rid of them, that firm admitted that many complaints had been received of a similar nature, and said that they were anxious to replace the faulty sample with others. I wrote thanking them, but declining the replacement. All I ask for is a little more care in exporting goods to the Antipodes.

F. Stanley Dobson, LL.D., M.L.C.

Melbourne, 5th March, 1890.

[We have omitted names of firms in this letter, to deal only with general principles. Mr. Dobson's remedy over one box of bad plates is not through newspaper channels.—Ed.]

THE HACKNEY PHOTOGRAPHIC SOCIETY.

Sir,—Below is our programme for June, 1890, at the Morley Hall, Hackney, Room No. 4 :—

Wednesday, 4th—Excursion to Loughton; trains leave Liverpool Street for Loughton at 10.6 and from Fenchurch Street at 10.13. Dine at "King's Head," Loughton, at 7; social evening. Saturday, 7th—Excursion to Wanstead Park; meet at Leytonstone Station at 3.8. Thursday, 12th—"Hand Cameras," Mr. A. R. Dresser. Thursday, 26th—"Selection and use of Lenses," Mr. H. Crouch. "Selection, use of Camera, parts, and apparatus advisable," Mr. J. O. Grant.

W. Fenton Jones, Hon. Sec.

12, *King Edward Road, Hackney, London.*

It is really astonishing what immense progress the art of photography has made these last few years. Why, you don't really know your friends' likenesses when you see them.—*Fliegende Blatter.*

Proceedings of Societies.

The Photographic Society of Great Britain.

At the technical meeting of this Society held on Tuesday evening last, the 27th inst., Mr. G. L. Addenbrooke occupied the chair.

The subject of stereoscopic photographs and apparatus having been previously announced as matter for the evening's discussion,

Mr. T. Sebastian Davis showed a stereoscopic camera fitted with a sliding shutter resembling a drop shutter, with two openings, but working laterally by pushing with the finger, or by an elastic band instead of falling by gravity. The openings in the moving board were made as long as practicable, and by this means it was not necessary to adjust it to a great nicety when used for time exposures. As to the distance at which the two halves of slides should be mounted, they ought not to be more than about $2\frac{5}{8}$ inches, which might be considered as a full average of the distance of the human eye from centre to centre; otherwise the pictures did not properly coalesce in the stereoscope. He thought, too, that the size and proportion generally chosen were not the best. He believed that many amateurs had given up stereoscopic photography on account of the smallness of the angle of view included in the pictures. He would get over this by the use of a lens of short focus—3 inches. The picture should be $2\frac{3}{4}$ inches in length; but, for landscapes, he thought a more artistic and satisfactory proportion would be to have them only $2\frac{1}{4}$ inches in height. The surface for printing on should, he thought, be as fine and free from grain as possible. Albumen paper he did not consider fine enough, and glass transparencies were not suitable for all subjects.

Mr. Arnold Spiller considered that paper prepared with chloride of silver in gelatine was better than albumen paper for the purpose. There was a fine enamel as a basis for the emulsion, and there was more detail in the shadows than with albumen paper.

Mr. Friese Greene said that it was his impression that celluloid was better than paper as a basis for stereoscopic prints.

Mr. Atkinson showed a stereoscopic print upon gelatino-chloride of silver paper, which supported Mr. Spiller's view. He also showed a stereoscope fitted with achromatic lenses.

Mr. Valentine Blanchard thought it was an objection to the dimensions proposed by Mr. Davis, that the foreground would be so much cut off. It was just the foreground in landscape pictures generally that gave such value to the stereoscopic effect of the photograph. In order to utilise the foreground to a greater extent than would otherwise be the case, Mr. Wilson, of Aberdeen, would frequently place his camera within two feet of the ground.

Mr. W. E. Debenham said that the necessity for limiting the distance at which the two halves of a stereoscopic photograph should be mounted, depended upon the eyepieces used. These might be so arranged as to unite two photographs of, say, whole-plate size. In any case it was desirable to have the eyepieces so mounted that they could be separated more or less. By this means they could be adjusted for eyes that were either farther apart or nearer than the average, and adjustment could also be made for photographs that were mounted at a greater or less distance apart than ordinary.

Mr. T. Samuels thought that it was more correct in principle to use a single lens in a Latimer Clark camera rather than a pair of lenses. The axis could then be directed to the centre of the pictures.

Other members did not hold the same view.

Mr. W. England had sometimes, when photographing statuary, used a lens of twenty inches focus. This was to prevent exaggerated perspective caused by coming too near to the subject. He also showed photographs of large size, mounted as stereoscopic pictures. They required a special stereoscope in which the pictures were necessarily farther apart, and farther from the eyepieces than in the usual form of instrument.

Mr. L. Warnerke showed some specimens of a gelatine film

which had been prepared as a basis for a second coating with silver emulsion. It never had been coated, but was nevertheless covered along the exposed edges with a stain like that seen on plates that have been kept for some time. He thought, therefore, that this stain, which has been so often noticed, does not belong to the silver emulsion, but to the gelatine itself.

Mr. Chapman Jones said that the edges, which looked dark on the plates, came out clear in the developed picture.

Mr. Arnold Spiller said that the films shown were not comparable with the gelatine in an emulsion, as in these films there was a large quantity of carbolic acid, the action of which must be taken into account.

Mr. L. Warnerke showed a block that had been made upon a zinc plate previously coated with copper. The plate was so hard, that five thousand impressions might be worked off it.

The Camera Club.

May 22nd.—Sir George R. Prescott in the chair.

The Chairman exhibited a hand camera which he said that he cousidered to be the simplest that he had ever seen; the plates were mounted in sheaths in a kind of a book, and each plate, after exposure, fell down on hinge, leaving the next to be exposed after it was moved into true focus; and this was done by one movement.

The Hon. Sec. exhibited a Watkins exposure meter and one of Fallowfield's sheaths for plates.

Mr. E. R. Shipton read a paper entitled "Cycle Photography and its Recent Developments, including an Ideal Cycle," and said that by means of a tricycle the photographer rolled his kit instead of walking with it, so economised energy and gained the power of going farther afield; in fact, on a tricycle he could conveniently carry a 15 by 12 inch camera and appurtenances. He exhibited a tricycle with wheels fitted with the new pneumatic tyre, and described various spring carriers for attachment to any tricycle to protect the photographic apparatus from vibration. The pneumatic tyre had given him an average of two miles per hour increase in speed, and had proved most luxurious in use, but added £6, or thereabouts, to the cost of the vehicle; he could go eight or ten miles an hour with it, carrying 100 lbs. weight of luggage; the weight of his machine was about 95 lbs. He could go over every kind of road, including sharp flints. For the first few days he was nervous about going over stones with the new tyre, but gradually gained confidence, until he took every kind of road which came in his way, and altogether he had been about 300 miles with the new tyre. The tyre must not be allowed to get flabby, but must be kept blown out; he had had to blow out his tyres three times, and lapse of time, more than of work, seemed to render this necessary.* He described the construction of the pneumatic tyre, how to blow it out with a little forcing syringe, and how to repair it should it get accidentally or wantonly punctured. So far, his tyre had not become even marked, and seemed as good as at first.

Mr. H. Sturmey remarked that one objection to the pneumatic tyre was, that if it were driven at a large obstacle, such as a brick, it gave a rebound, and "up went the whole lot." The great bugbear in cycling with photographic apparatus was dust, especially that caused by the jolting of the plates in the slides. Sometimes with the new tyre he had driven two miles an hour faster, but on the average had not gained much in speed over that obtainable with the old one; with the new tyre, going down hill, the machine went flying.

Dr. Patterson had found the resistance of the air to be of more importance than weight when tricycling, and liked the baggage to be so packed as to present as narrow a surface as possible towards the front of the machine.

Mr. Enrico Ferrero had been a cyclist for twelve years, and did not believe in carrying so great a weight of luggage. An expert like Mr. Shipton could do more in the carrying of luggage than could an ordinary cyclist. He (the speaker) did not believe in tricycles in photography; they were always an encumbrance; with them the photographer had chiefly to keep to the road, and not to enter paths and fields to get views he frequently required. A safety bicycle and half-plate apparatus would be found to be as convenient as anything. The best place for carrying photographic luggage was on the back of the cyclist.

Mr. George Davison had also found a tricycle to be always in the way when used on a photographic expedition.

Mr. Shipton, in the course of his reply, said that he wished that opticians would make casket lenses with a shutter forming part of the lens tube, and not burden purchasers with so great a weight of brass as at present, when lenses of different kinds are carried.

* Certain gases will slowly pass through india-rubber, and the oxygen of common air passes more rapidly than the nitrogen.—Ed.

The Hackney Photographic Society.

The ordinary meeting of this Society was held on Thursday, Dr. Roland Smith (vice-president) in the chair. Mr. E. J. Wall's paper on "Photographic Chemistry" was read. Mr. Wall preferred giving an elementary paper, as there were many amateurs who only took up photography for the purpose of getting pictures without the particular study and value of each of the chemicals used. He described the manufacturing of plates and the compounds used, and gave the uses of chemicals in other photographic operations. In the discussion which followed, Messrs. Dean, Grant, Reynolds, and others took part. Mr. Dean showed a simple stereoscope made by Pumphrey. He had found it effective. Various books were given to the Society by Messrs. Dean, Reynolds, Grant, and the Secretary.

On the motion of Mr. Reynolds, a vote of thanks was passed to the officers of the Society for their efforts during the past year, and he complimented the Secretary for the manner in which he had conducted the affairs of the Society.

Mr. Bruce Capel was elected a member.

The excursion on June 4th will be to Loughton, and on the 7th to Wanstead.

London and Provincial Photographic Association.

At the meeting on the 22nd inst., Mr. A. Cowan occupied the chair.

Mr. H. M. Hastings exhibited some prints on the new chloride of iridium paper. Some pieces also of this paper were distributed among the members for trial.

Mr. J. Traill Taylor read a paper on the "Ethics of Photography" (see page 412).

In the course of the discussion that followed the reading of the paper—

Mr. W. E. Debenham disagreed with the idea that amateurs interfered detrimentally with professionals. The great strides that photography had made were due, in a great measure, to amateur workers.

Mr. T. E. Freshwater spoke of the anomalies that were sometimes seen in photographs on the market. He referred, as an instance, to a photograph of a brook, which had a very large sale. A stork had been printed-in not in proportion to the surroundings; the stork was about three times the size it ought to be. He knew a case where a gentleman sent some negatives of Florence to have some prints made; when he received the prints he found some clouds had been introduced into the pictures. The prints were all returned with the remark, that clouds were not usually seen in Florence.

The Chairman said that it was sometimes not borne in mind, when printing-in clouds, that they should be reversed in the water; he had seen photographs with clouds printed in the sky which were conspicuous by their absence in the water. The reflection of clouds in water was easily done by printing through the glass.

Mr. W. E. Debenham, speaking of stereoscopic vision, said that, in addition to the microscope and stereoscope, there was an instrument which, he thought, might prove useful in warfare; he referred to the telestereoscope, by which the solidity of an object at a distance could be judged. Some years ago he constructed a telestereoscope, using a pair of field glasses for the purpose. To one of the object glasses a mirror was fixed, which received the reflection from a second mirror fastened at the end of a rod fixed at right

angles to the field glass; by this means distant objects could be viewed stereoscopically. Mr. Debenham explained the construction of the telestereoscope by diagrams on the blackboard.

Mr. T. WALTENBERG asked whether he could restrain anyone from copying a photograph he had taken some years ago; he had been paid in the usual way of business by the sitter, who was now dead. It was the opinion of the members that, having been paid for the negative at the time of sitting, he had no publishing rights whatever in the possession of the negative.

THE PHOTOGRAPHIC SOCIETY OF IRELAND.

THE last meeting for the season of this Society was held on Thursday evening, 22nd inst., by permission, in the Lecture Theatre of the Royal College of Science, Stephen's Green, Dublin, and took the form of a public exhibition of lantern slides. There was a large attendance of members and their friends, and upwards of 200 slides, principally contributed by members, were passed through the lanterns. In the absence of Dr. J. Alfred Scott (vice-president) the slides were described by the hon. sec., Mr. J. H. Hargrave, C.E. The lanterns were worked efficiently by Mr. James Carson, C.E. Amongst the slides deserving special notice were those of Miss White, the only lady member of the Society, and the "slumming" hand-camera work of Mr. C. R. Strangways, Dr. J. A. Scott, and Dr. Cosgrave.

EYE-PIECE FOR THE LICK TELESCOPE.—It is said that the Lick Telescope will, in a few weeks, be supplemented by a remarkable piece of mechanism. This is an eye-piece which has just been completed at Rochester, N.Y. No other eye-piece of anythiug like equal dimensions has ever been made. The largest now in use is not over two inches in diameter, while the new piece measures over three inches. The eye-piece is constructed on a perfect theory. There are two lenses, six inches apart. The larger one is called the field lens, and is six and one-half iuches in diameter. The other leus is the eye-glass proper. It is composed of three lenses, a double concave, double convex and meniscus, cemented together. The field lens is of crown glass. The meniscus, or correcting lens, is of flint glass. The light from the heavenly bodies, seen through the Lick Telescope and this new eye-piece, will be 2,000 times as bright as that seen with the naked eye.

ARTIFICIAL ILLUMINATION.—Prof. Langley, says the *Detroit Free Press*, read a paper at Washington on the subject of artificial illumination, in which he advanced a novel idea. He says that all existing systems in a varying degree sacrifice economy, because a very large per centage of the energy used is diverted from the production of light to the useless generation of heat. This is not only a direct waste, but the production of heat is a positive disadvantage. He shows how much better nature does this work in the case of the firefly, and of the luminous infusoria which are seen upon the surface of the sea, aud are so numerous especially in the British Channel, as to have a practical effect in lighting the course of the vessels. He says that the light which distinguishes these insects is produced by a chemical, not by a physical process, and is unattended by any perceptible development of heat. He expresses the belief that a careful scientific study of these insects may lead to the discovery of a means by which the same effect can be artificially produced upon such a scale as to have an industrial value.

RECEIVED.—The monthly part for May, of "Traité Encyclopédique de Photographie," by Charles Fabre, published in Paris by Gauthier-Villars and Son. The present issue embraces, among other subjects of interest, a chapter on platinotype, and is, like its predecessors, freely illustrated.——From Ed. Liesegang, Dusseldorf, "Photographischer Zeitvertreib," by J. Schnauss. It contains a number of interesting applications of photography, old and new, collated from various sources, and is freely illustrated. A more extended notice will be given of the book in due course.——Watson's exposure meter, a criticism of which is postponed.

Answers to Correspondents.

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

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

L. E.—*Horny Dryness of Sensitized Albumen Paper.* During the prevalence of unusually hot or dry weather you may find it advantageous to add nitrate of soda to the silver bath. The addition of ten or fifteen grains to each ounce of sensitizing bath makes a considerable difference, but be careful not to exceed this amount, for there may be danger of staining your gelatine negatives. Sugar is sometimes employed for the same purpose.

M. P. S.—*Photo-Chemical Investigations.* An extremely important paper, embodying the results of many years of research, was read by Dr. Ferdinand Hunter, at the recent meeting of the Liverpool Section of the Society of Chemical Industry. The subjects treated of were the density or opacity of the negative, modes of measurements, development of plates under varying conditions, gradation secured by different developers, the intensification and reduction of negatives, unit of exposure, rapidity of sensitive plates, and instruments for actinometry. The whole matter is treated in a thoroughly scientific spirit, and we hope to give you shortly a résumé of the author's valuable communication. At the same meeting Mr. E. G. Ballard exhibited a new actinometer, in which Balmain's luminous paint is employed, but in a different way to that suggested by Mr. Warnerke.

TYRO.—*Action of Chromic Acid upon Alcohol.* The substance you obtained was aldehyde, which is always formed when alcohol is heated with sulphuric acid and a bichromate, or with chromic acid itself. Chrome alum could not give rise to its formation. Aldehyde has a very peculiar aromatic odour, aud in composition stands midway between alcohol aud acetic acid.

W. M.—*Backing for Drying Plates.* The common method is to paint with a mixture of raw sienna and dilute gum water or dextrine, but Dr. Fol's plan is better. It is to moisten a piece of carbon tissue cut to the size of the plate with equal parts of glycerine and water, and apply it like a sticking plaster to the back surface, pulling it off before developing the negative. The same piece of black tissue may be used many times. *Photo-Engraving.* See Answers to R. B. B., of Glasgow, last week. Mr. W. T. Wilkinson's book is not yet reprinted, but it contains much useful information.

A. SMITHSON (Dublin).—*Magnesium Chloride as a Fixing Agent.* Dr. Liesegang proposes the use of this salt as a solvent for chloride of silver, aud urges its superiority over hyposulphite on the ground of its being more readily got rid of by washing. It is equally applicable to plates and prints.

T. F.—*Lime Light.* Your letters received. The hand-bellows would be considered a disadvantage, and probably lead to inequality in the lighting. A powerful Bunsen burner, surmounted by a ball of platinized asbestos, or zirconia lime, might possibly give a steady light of sufficient intensity for copying purposes.

R. S. L.—*Cyanide Fixing of Gelatine Plates.* As a ready means of getting rid of free caustic potash in the cyanide, you might mix with it a certain quantity of sal-ammoniac, which would have the effect of turning this impurity into the harmless free ammonia, and then it could not soften the gelatine.

ENQUIRER.—*The Opera-Glass Camera.* The statement is probably true. A very similar, if not identical, arrangement was brought out many years ago by MM. Geymet and Alker.

A. M. M.—*The Journal of the Photographic Society of India* contains, as you say, amongst other matters of great interest, the identical paper which formed the subject of our correspondence. No injustice will be done by taking the proposed course, as the communication bears date April 22nd.

Received: CLAPHAM and W. H. S.; WM. HARBUTT, replied by post.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

TRANSLUCENT SCREENS FOR DEVELOPING-ROOM LAMPS.

LAST week the subject of transparent coloured screens for developing-room lamps was considered. Next in order come translucent screens, such as those of opal or ground glass, or fabrics like paper or cloth.

A translucent screen may act in two ways, namely, by its colour, if it have any, and by its translucency. By means of its latter function it diffuses the light from the flame, preventing the rays from the latter falling direct upon the plate; it also, to a limited extent, quenches some of the blue and violet rays. Particles in suspension, such as mist or dirt in the air, or solid particles in translucent screens, tend to cut off the blue and violet rays more than the yellow and red; this is why street gas flames, seen through a fog, appear redder and redder the farther they are from the eye of the spectator, and why most samples of opal glass have a yellowish hue when viewed by transmitted daylight. For this reason a sheet of opal glass, used with a sheet of unsafe ruby glass in a developing-room lamp, will probably at once make the light practically safe, not alone by lowering the intensity of the light by diffusion, but by cutting off more or less of the feeble band of blue rays which found its way through the imperfect sheet of ruby glass. As, however, two sheets of ruby glass scarcely reduce the amount of light in the room more than does one sheet, two sheets of ruby glass and one of opal glass in each window of the lantern tend to give an exceedingly safe light, all other conditions being equal. Opal glass has such power of quenching and diffusing any feeble blue radiations which may find their way through an imperfect sample of ruby glass, that any spectroscopic testing of the triple screen described is practically unnecessary. Opal glass is the best diffuser of white light known obtainable in mass, but it quenches such a large per centage of the light that gas globes made of it prove excessively costly in use, unless the light required to be utilised falls where it is wanted through a large orifice in the bottom of the globe. Ground glass, which consists of plain glass with a surface of minute abrasions, cracks, and scratches produced by grinding, is not so good a diffuser as opal glass.

For the perfect diffusion of white light, it is necessary that the particles producing the diffusion should be exceedingly clean. One more perfect means of diffusing light than by opal glass is known, but cannot be utilised in photography, namely, by means of smoke consisting of particles of phosphoric acid. Phosphorus burnt in oxygen gas throws off this smoke, and when the smoke gets thick enough to hide the flame of the burning phosphorus, a light is obtained surrounded by the best and cleanest diffusing medium known.

Cloth, paper, and such like fabrics for developing-room lamps now demand attention, and at first sight it seems strange that such coarse substances should be so useful when dealing with such minute agencies as waves of light. Put a piece of coloured cloth or tissue paper under the microscope, and, with a strong white light on the other side of the fabric, it will be seen to be full of minute holes, letting through white light in abundance, and brighter light will be seen coming through some parts of the fibres themselves than through other parts. If, now, two thicknesses of the fabric be used, almost all the white light is cut off, because a hole in one thickness will rarely so come before a hole in the next thickness that a ray of white light can pass through both. Three thicknesses of red cloth make an excellent screen, the total amount of colour and translucency being large, and all pure white light cut off. Telegraph cables are made on the same principle; there might be a fault in one layer of gutta-percha, but if the cable have a second layer, it is hardly likely that a fault will occur in both at the same place; three layers of gutta-percha make everything practically safe.

Sometimes it is recommended in print to make a developing-lamp window with one large sheet of red cloth, and those who make the recommendation have doubtless found it to answer in their own experience; yet this single screen lets some white light pass through

its numerous minute holes. The explanation is, that the exposure of the plates of such operators has been long enough to enable a good image to be developed before the fogging power of their light has had time to act injuriously. On the same principle, by suitable manipulations, an instantaneous exposure on one scene may be given to a plate by means of a shutter, and afterwards a longer exposure of the same plate to another scene, and in the developing bath the latter will come up all right, with no trace of the former. As regards developing-room lamps, it is as easy to make good as bad screens, so it is as well not to employ imperfect means, which have to be compensated in other ways, when good results have to be obtained therewith.

There is reason to suppose that dead white bodies, such as opal glass, are entirely built up of transparent particles. The foam of the sea is white, yet it is formed entirely of transparent drops of water; the light getting into the midst of the myriads of drops is refracted and reflected in all directions, and becomes so scattered as to produce the effect which is called "white." The same thing occurs with ground glass. The glass is as transparent as ever it was, but the numberless minute cracks, scratches, peaks, and valleys upon its surface scatter the incident light and produce the dead white effect to the eye. The whiteness of paper is due to the way in which it scatters light, but let its interstices be filled up with varnish, it scatters the light less, and the transparency of the cellulose fibres becomes more manifest.

PHOTOGRAPHS OF LONDON.

The day is approaching when the man who does not use a camera will be looked upon as quite a remarkable character, and his biography and portrait will appear in those publications which keep the memory green of those who have deserved well of their country. But before that day comes the Continent, and places generally where holiday seekers most do congregate, will photographically be used up. There will be then no spot which has not been haunted by the photographic worker, and "taken" by everybody. Perhaps, however, London itself will escape this general photographic scourge, for it is a remarkable circumstance that every dweller therein runs away from the "big village" before he deigns to unlimber his camera and tripod. Why this should be so we cannot guess, unless it be a kind of perversion of the text which tells us that no man is a prophet in his own country. Certain it is that most photographers do not see in their own city anything worth photographing; otherwise they would not be in such a hurry to turn their backs upon it in favour of places not possessing one tithe of its beauty or interest.

Although we hold that in London can be found a wealth of pictures by those who have eyes to see and minds to appreciate, we must confess that London people are far from picturesque. To begin with, we have no distinctive national costume. Next we have the influence of fashion, which plays mad tricks with the human form divine, and which does its best to correct or destroy the graceful design upon which our first parents were built. If we turn to western London, and stray into Kensington Gardens, we are among these fashionable folk. They are what is called well dressed; but they are all alike to the photographer, who must perforce neglect the charms of colour. One lady is to him adorned very much like another, the tailor-made girl being predominant; and as to the men, there is still less variety, for the coats are all of one pattern, and the chimney-pot hat does not lend itself to artistic treatment. If we go east we have a difference, but little variation. The starched collar is replaced by the dirty spotted neckerchief; the black coat by one which was once black, but which, like the average lodging house keeper, "has seen better days;" and the shiny hat of respectability is deposed in favour of the "billycock." But look at them as we may, no one is picturesque. One class is trim, clean, and neat, and the other slovenly and dirty, but they do not make good pictures.

The streets themselves are, some of them, in spite of the march of improvement, full of beauty. Of course there are miles and miles of ugly thoroughfares, with rows of houses exactly alike. There is the Belgravia pattern, the Bloomsbury pattern, the Pimlico pattern, and any number of other patterns peculiar to the districts in which they occur, and which owe their design to the fertile imagination of some jobbing builder, who has often been, more successfully, the architect of his own fortune. Then there is the suburban villa, which can only be described by that truly dreadful word, "genteel." All these the searcher after the picturesque will studiously avoid. He can, if he will only seek them out, find plenty of old world nooks in and about the city. Crooked lanes, containing rickety houses, and ending often with a peep at some old church tower, or spire, which completes a perfect little picture. Then there is the noble river Thames, which affords an endless field for pictorial possibilities. The river has plenty of photographic worshippers, but they all confine themselves to its upper reaches, and everyone takes the same views. There is, for instance, that eternal cottage on the bank near Cookham, Boulter's Lock, and many other spots which have been so often photographed that, if the wet process had continued to hold its own, the taking of these pictures would have run the Thames dry. But it is in the city part of the river that the real pictures are to be had, and one artist—Wylhe—has been quick to see this, as his noble masterpiece, now hung at South Kensington, and many of his other works, declare. Photographs of barge life, of merchantmen, and of the Dutch-built boats which still find their way to London Bridge, form in themselves materials for much study.

The extreme ugliness of the London houses is in many places relieved by the beauty of the trees. It is too much the fashion to talk of the smoke, the dirt, and the noise of London streets, as if there were no beauty, no cleanliness, and no quiet to be had anywhere

within its walls. All lovers of the metropolis will resent this as a gross libel, for there are not only many quiet spots, but there are plenty of beautiful trees. And especially beautiful are these trees just now in the early summer, when they have but lately unfolded their leaves. Some of our suburban streets, too, just lately have been brilliant with laburnum, lilac, and white and red may, the colours of which have delighted the eyes of those who seldom see a country lane, while their scent has reminded them—as only a scent can—of long-forgotten days among fields and hedgerows.

But what may be called the permanent trees of London are full of beauty, and especially is this true of the noble plane tree, which flourishes with such unwonted luxuriance that it would almost seem as if it preferred to suck in the carbonaceous matter necessary to all vegetable growth in the form of soot and fog. Walk by the side of some of those old squares in Bloomsbury, from which fashion has long ago fled, and where many of the houses are let out in apartments, or are filled with boarders. The trees there are above the dictates of fashion, and continue to thrive and afford a grateful shade to those who pass by. In Bedford Square, Mecklenburg Square, and many other similar localities these plane trees are in lovely condition, and throw out their twenty-five or thirty foot branches, crowded with graceful foliage, over the footpaths, and they wave lazily in the gentle breeze as the afternoon sun steals through their leaves. But even in the city itself trees are not unknown. In one or two of the old city churchyards there are fine specimens. Note those, for instance, hard by Billingsgate, just opposite the Custom House, where thousands of sparrows congregate in the evening, and make a veritable Babel with their ceaseless twittering. Nor must we forget that famous tree in Cheapside which has been immortalised by Wordsworth. It is now, unfortunately, walled-in in such a manner that its top only is visible from the main thoroughfare, and it is a matter for wonder that it continues to live under such conditions. But we believe that it is a fact that, within the past twenty years, rooks have been known to build in that tree, until, perhaps, the long journey necessary to them before they could obtain their natural food, made them give up the struggle.

If proof were wanted that London is capable of affording fine opportunities for the picture maker, we might refer to an exhibition of water-colour drawings, by Mr. Herbert Marshall, R.W.S., which was lately opened in Bond Street. Here we had no fewer than one hundred sketches in colour by one artist, many of them being perfect little gems. If one painter can do so much, surely there is much to be done with a camera.

The Devon and Cornwall Camera Club forwards a programme of summer outings; among them we notice the Royal Plymouth Yacht Club Regatta, to which the Photographic Club will be conveyed by its aquatic *confrères* in the s.s. *Sir Francis Drake*.

GUAIACOL AS A DEVELOPER FOR DRY PLATES.*

BY COLONEL J. WATERHOUSE, B.S.C., ASSIST.-SURVEYOR GENERAL OF INDIA.

In connection with the use of the pyrocatechin, or catechol, as a developer for dry plates, it struck me that guaiacol, or methycatechol, which is a very much cheaper product, being only about 1s. 6d. an ounce, instead of 4s. a drachm, might possibly be of use in the same way. On trial I find it is so, and it may, therefore, be interesting to the Photographic Society to know of it, in order that further trials may be made by anyone interested in the matter. I cannot find any record of its having been tried before.

Guaiacol is a colourless, oily liquid, with a rather pungent smell. It is obtained by dry distillation of guaiac resin, and in other ways. It is only slightly soluble in water, but readily so in alcohol, ether, acetic acid, and alkalies. I find it dissolves easily in solutions of caustic soda or the carbonate of soda, the solution having a slight green tint.

I have not yet had time to ascertain the best proportions for developing purposes, but 20 minims of it in 2 ounces of a solution of carbonate of soda crystals at 4 per cent., well stirred till dissolved, gave a solution which, though somewhat slow in action, possessed very fair developing powers. A similar solution of 30 minims of it in 2 ounces of a solution of caustic soda (1 part solution used with Thomas' hydroquinone developer, diluted with 3 of water) developed rather quicker, but otherwise seemed no better. The negatives are not nearly so dense as those obtained with a similar solution of pyrocatechin, but are more harmonious. The deposit is even and fine grained, and of a yellowish-brown tint, which seems to have fairly good printing powers. I enclose some film negatives, with prints. There is no tendency to stain or fog, nor to the superficial veil common with hydroquinone. The developing solution, after use, takes a much stronger colour, and also has a strong empyreumatic smell, which is somewhat persistent, and sticks to the hands for some time afterwards.

So far as I can see at present, guaiacol is not likely to supplant ferrous oxalate, pyrogallol, or other recognised and well-tried developers, but the use of a liquid developing agent is new and interesting; and, if the material itself can be kept indefinitely without decomposition, it might be useful for travellers in place of the more readily decomposable dry developers, like pyrogallic acid and hydroquinone, which easily spoil by exposure in corked bottles. The smell will be somewhat against the new developer, though it is really not unpleasant, and is probably wholesome, as guaiacol has recently been recommended as a remedy for consumption.

According to Watts,† guaiacol forms crystalline salts with the alkalies and alkaline earths, which appear, as might have been expected, to be readily decomposed and turned black by exposure to air and moisture. Otherwise they might form very efficient developing salts, and be more convenient to use than the guaiacol itself. To have the alkali and developing agent together in a single crystalline salt would be most useful for travellers. The further development of this phase of the question I must leave to more experienced chemists.

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* The above paper was received too late to be read at "the May meeting of the Photographic Society." Any discussion that may arise on its publication will be taken at the June meeting.

† *Dictionary of Chemistry*, Vol. II., p. 946.

THE CITY PHOTOGRAPHIC EXHIBITION.

The above exhibition was opened to the public last Saturday at the Drapers' Hall, Throgmorton Street, London, and on the preceding evening its promoters, the Photographic Section of the London Chamber of Commerce, invited a number of their friends to a *conversazione* in the hall. Among those present were Alderman Sir H. and Lady Knight, Sir Charles Clifford, Sir Frederick Young, Mr. Carl Ulrich, Vice-President of the Amateur Photographic Association of Vienna, Mr. John Spiller, Mr. Leon Warnerke, Miss Warnerke, Sir Charles Mills, Mr. Alderman and Sheriff Stuart Knill and Mrs. Knill, Mr. Under-Sheriff Beard, Mr. Alderman Cowan, Mr. J. S. Balfour, M.P., Mr. Howard, M.P., Mr. W. F. Lawrence, M.P., Mr. D. W. Coates-Hardley, Mr. Benjamin Scott (City Chamberlain), Mr. J. S. C. Heywood (Master of the Drapers' Company) and Mrs. Heywood, Mr. and Mrs. S. Hope Morley, Mr. and Mrs. T. Tyrer, Mr. W. S. Bird (Chairman of the Photographic Section), Mr. F. Bishop (Deputy-Chairman), Mr. K. B. Murray (Secretary), Sir G. Chambers, Mr. E. N. C. Braddon, Sir James Garrick, Senor de Olano, Mr. A. S. Pollard, M.A., Mr. J. A. Brand (City Comptroller), and Mr. W. Leaf.

In formally declaring the exhibition open, Sir Albert K. Rollit, M.P. (Chairman of the Council of the London Chamber of Commerce), delivered a short address, in the course of which he spoke of the great development of photographic art, as shown in the exhibition, and emphasised the wisdom of making the art familiar to as many minds as possible, thus leading the public to appreciate and cultivate it. Looking at it from another point of view, he said that they must not forget what photography had done for cognate sciences. The recording and measuring instruments connected with photography gave the opportunity of fixing questions of time and space beyond the possibility of human error, and in connection with astronomy and physical science the assistance of photography had been invaluable. They were deeply indebted to those who had taken so much trouble to bring this exhibition about, and he felt it a personal privilege to be able to declare it formally open. A vote of thanks having been accorded to the Drapers' Company for the use of their hall, Mr. Alderman and Sheriff Knill briefly apologised for the absence of the Lord Mayor, who had only that evening returned from Yorkshire, in, he was glad to say, much better health.

The exhibition included a fine show of apparatus and photographs, but in the collection were few things of novelty; the object of the exhibition was to show the public something of the present position of photography and its appliances, and in this it succeeded well. Day by day the attendance of the general public increased, probably because the rumour spread from month to mouth that in the Drapers' Hall was a photographic picture gallery worth seeing, and should the exhibition become an annual institution, the benefit will be felt of having broken the ice of public apathy this week.

Mr. Walter Tyler, of London, exhibited lanterns and cameras; Mr. W. F. Slater, frame mouldings and apparatus; Mr. Gotz, apparatus and lenses; Mr. Abrahams, apparatus; Messrs. Houghton and Co., the French pantascopic camera, already described in these pages; Mr. F. W. Hart, varieties of apparatus and a portable stand of bamboo, which, when disjointed, can be readily carried under the arm, and can be fixed so as to hold backgrounds and reflectors for use in private houses with the flash-light; it can also be used to hold a magic lantern screen; at the exhibition it was used with curtains, so as to form a kind of canopy over Mr. Hart's stall; this portable stand is a new invention. Mr. Dallmeyer exhibited lenses; the Stereoscopic Company, apparatus; Messrs. Sands and Hunter, apparatus; Messrs. R. and J. Beck, apparatus; Mr. Schölzig, albumenised papers, and a few German cameras and stands; Mr. Morley, apparatus; Mr. Crouch, apparatus; Messrs. Marion and Co., appparatus, and an illustrated book issued this week by Mr. Robert Slingsby, on photography by the flash light. Mr. B. J. Edwards, specimens of work in orthochromatic photography; Messrs. Watson and Son, apparatus; they exhibited one of their "Acme" cameras fitted with an extra-wide front for stereoscopic work, and it is useful to be able to apply a light modern camera in this way. Messrs. Wray and Sons exhibited lenses; Messrs. Newton and Co., elaborate oxyhydrogen and electric microscopes; Messrs. J. Lewis and Co., apparatus; Messrs. Pearson and Denham, apparatus; Mr. E. G. Platt, brass work for photographic apparatus; Mr. J. D. England, celluloid negatives and films; Mr. England says:—"The instantaneous views were taken by my father and myself on a trip to Bushey Park on Whit Monday, and although the apparatus was jolted on a tricycle over a dusty road, there is scarcely a single pinhole on any of the negatives." Messrs. Perken, Son, and Rayment exhibit apparatus. Mrs. George Smith exhibited some transparencies mounted as table lamp screens and fire screens; Mr. George Smith exhibited his sciopticon camera and other apparatus; Messrs. Mawson and Swan, apparatus.

"Walks in the Grand Duchy of Luxemburg," will form a new illustrated section to the forthcoming issue of Mr. Percy Lindley's "Walks in the Ardennes."

Hydroxylamine Developers.—There is a new reducing salt, also a reducing solution sold by the Badischen Aniline and Soda Fabric Company, which contain hydroxylamine. The former compound is a white substance with an acid reaction, soluble in ten parts of water. It contains sulphate of hydroxylamine and some organic substance. Analysis showed that 100 grammes of it contained an amount of hydroxylamine corresponding to 16·5 grammes of the hydrochloride, while 100 grammes of the solution contained a quantity equivalent to 10 grammes. Hydroxylamine is a very suitable developer for gelatino-chloride plates,—A. Lainer, in *Phot. Mitt.*

Doubly Albumenised Papers.—M. L. Van Neck gives the following formulæ for sensitizing and toning doubly albumenised and very brilliant papers. 1. Add magnesium carbonate to the silver bath in the proportion of two grammes to a litre of the bath; this will prevent the formation of a red colour in the bath. 2. The strength of the sensitising bath should not be more concentrated than from 8 to 10 per cent. It may be strengthened from time to time by the addition of a 12 per cent. solution of silver nitrate. 3. The washing before fixing should be done with tap water, rain water being frequently very impure. 4. Toning bath:—

1.—Sodium acetate, pure fused ...	15 grammes
,, ,, crystallised ...	15 ,,
,, biborate	8 ,,
Distilled water	2 litres
2.—Gold chloride (brown)	1 gramme
Distilled water	50 c.c.

An hour before use mix the two solutions, shake well, and place in the flask in a strong light. The toning action is very rapid. In winter the solutions must be kept at a temperature of 20° C. —*Bulletin Belge.*

PHOTOGRAPHS ON VIEW AT THE DRAPERS' HALL, THROGMORTON STREET.

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

The number of pictorial exhibits is not so large as one would expect, for, although most of the well-known large firms are represented, yet one rather expected to see a stronger contingent of the less known workers sending one or two frames of their best work.

Passing up the spiral staircase, and entering the room nearest the top of the stairs, the visitor finds himself in what, for convenience sake, may be called Gallery I. As there are no numbers on the frames, it may save time by saying at the outset that the order of these notes runs from right to left round the walls, and then the screens are taken in order.

Close to the left of the door on entering are several frames sent by Messrs. Waterlow and Son, illustrating those processes of reproduction for which this firm is so well known. It is instructive to notice, not only the various effects produced by different methods, but also how both surface and tint bear influence in the general effect. Messrs. Frith come next with two frames—one chiefly landscape, executed in the manner familiar to all who know their name, and a second, devoted to architectural studies; some of the interiors are remarkably fine. Then come Messrs. Lambert Weston and Sons with several frames: that at the bottom in the left-hand corner, seems to outstrip the others—at any rate, for pose and ease of expression, and unconsciousness of the operator. Above is "Our Village," produced by Mr. Thurston. Perhaps one might venture to say that this is *not* Bushey; the clouds seem rather heavy for the lighting of the roadway. To the right of this is "A Misty Morning," and very misty it looks—a picture well worth careful study.

The inevitable "Eiffel Tower," with Wray's rapid rect., is not far off, and in company with several yacht studies by Messrs. West and Son, all of which are admirable specimens of that well-known firm's work. At the other end of the room, and near the door, are found several of Mr. Payne Jennings' pictures, many of them so well known to travellers over the Great Eastern Railway. A very small one in the middle of the frame nearest to the doorway should be noticed.

Passing to the screens, the first frame likely to interest is that containing the two poets, Tennyson and Browning, by Cameron and Smith. Messrs. Elliot and Fry send a large show in various styles, the most pleasing, as a study, being a portrait of a little lady in red carbon—the smooth, bright, clear, surface of the so-called opal being fitted for the rendering of such young and tender skin, the bloom of maidenhood. Mr. F. Dower sends a collection of very interesting studies, chiefly of Professor Herkomer, R.A., as "Filippo," in the poetic comedy performed at the Bushey Theatre in April last. These admirable studies would have been still more interesting had a little care been given to the background; or at least, to avoiding the dark band behind the legs. Near here is an instructive photogravure, after Blair Leighton, by the Typo Etching Company; also, close by, are several flash-light productions, which will interest experimentalists in this direction. Messrs. Window and Grove, and also Morgan and Kidd, are fully represented on the screens in this room.

On entering Gallery II. the Stereoscopic Company demand attention by their numerous productions in various styles, and here may be seen several portraits of well-known public characters. Then comes an admirable portrait of Professor Huxley, and also another, nearly as good, of Dr. Joachim; both are well worth careful study, and reflect great credit on Messrs. Downey. Messrs. Fry (Brighton) show a frame of camp life studies which will be of interest to the Volunteer "camper." The Autotype Company exhibit a large screen of carbon pictures in various styles of frame and shade of tint. Many old friends turn up again, but are none the less worth re-study. The Parthenon Frieze must on no account be passed withou due attention.

On the other side may be seen a collection of curious and deeply interesting early fans, produced at a time when it was *not* necessary to say, as it seems now-a-days, "painted by hand" (as though it was more general to use the feet for that purpose). The antiquary will be interested in seeing a reproduction of a page of the Magna Charta. Messrs. Bedford Lemere and also Mayall send numerous examples of their portrait and other work.

The third gallery (or exit passage) is not very happily lighted, there being rather too much glare and glint on the glass to enable seeing the pictures to full advantage. Mr. Flather sends specimens of the "dry point or needle finished" enlargements, which produce an effect somewhat out of the usual enlargement groove. Next come two fine portraits by Robt. Faulkner, and various specimens of his proverbial skill with children. High up—too high up, in fact, for comfortable survey—are two large opal studies of "Sun and Cloud," by Friese Greene, interesting in more ways than one, and decidedly reflecting credit on their producer.

Several portraits of Mr. Thomson recall the Gainsborough style of background, and are suggestive of various hints in that respect. Three or four portrait studies by H. S. Mendelsohn, and Messrs. Doulton & Co., reproductions of those never-to-be-forgotten Tinworth bas-reliefs, bring our survey to an end.

A small gathering of lantern-slides by Messrs. Fincham, York, & Son, and "last but not least," Mr. G. Smith (trading as the Sciop tican Co.), also a collection of coloured ones by Newton & Co., are to be seen in some of the windows.

On the whole, although not being particularly impressed with any great proportion of new work, there are several pictures worth study, even if seen before. It is not a very rash prophecy to prognosticate that if an exhibition be held on similar lines, say in ten years' time, there will be seen a decided change in some respects at least—the direction will be, perhaps, rougher surfaces and less retouching.

On Monday next, June 9th, Mr. G. J. Clarke will give a lecture on "Photographic Optics" before the North Middlesex Photographic Club, Jubilee House, Hornsey Road.

Can it be true that the historically interesting initials, devices, and mottoes on the walls of the old prisons in the Tower of London have never been photographed? A writer in the Photographic News assures us that he made inquiry on the spot, and received a negative answer. This of course does not mean that the "beefeater" produced a "negative," but, on the contrary, that this simple and only trustworthy mode of reproducing these pathetic records of captivity had not been adopted. In their place some etchings were offered; but these are obviously very different things. The camera should at once be brought to bear upon the inner walls of the Beauchamp Tower.—*Daily News.*

PHOTOGRAPHY IN ROME.

The *Bollettino*, a journal published every two months in Rome, and the chief organ of those interested in photography in that city, gives the result of the last election of members of its Photographic Society as follows: Adler, Dottor Vittoria; Intrigilo, Avv. Benedetto; Tenerani, Cav. Carlo; and of the correspondent members—Calvaria, Cav. Avv. Giuseppe, of Castellamare di Stabia; Daniele, Oreste, of Catania; Garzia, Oronzo, of Maglie; Hermans, Charles, of Brussels; and Orsini, Marchese Antonio, of Solmona.

The opening of the Second Annual Exhibition of Photography took place in the Palazzo di Belle Arti on the 2nd of May, when a large number of members took part.

The display included landscapes and interiors, portraits, instantaneous views, film negatives, photo-micrographs, enlargements, flash-light pictures, architectural views, and representations of costumes taken in Morocco and in Sweden.

An excellent article on "The Duration of the Pose" begins thus:—"Formerly, when collodion occupied the whole field of photography, the first difficulty in the art was the preparation of the sensitive surface. Now that the preparation has undergone a radical change, passing into a branch of industry, that first difficulty has vanished, and there has succeeded to its place the duration of the pose, the exact determination of which has over the resulting picture an influence as great, and possibly greater than formerly, seeing that in the very short poses of the present time even a little error has a value of relatively greater importance." The article goes on to say that the duration depends (1) on the sensitive preparation, (2) on the actinic power of the light, (3) on the object, (4) on the diaphragm, and (5) on the distance. Thus, if it were required to represent by an algebraic formula the conditions governing the pose t'', we should have—

$$t'' = k.\ P.\ L.\ O.\ d.\ D.$$

where k is the invariable constant.

The article, which is too long to translate, is written by A. Roncalli. It is succeeded by a short notice of the effects of the Schippang varnish upon collodion enlargements. This article, written by Ab. F. Castracane, makes mention of some unhappy results of the use of this varnish on some of his own pictures. After this comes a letter from Sac. D. Ratti, on halation, or *aureole*, as the Italians call it. Then a paper on the development of instantaneous negatives and on the toning of aristotype paper, by Bne. T. Melazzo. Various notes and receipts, with a bibliography and a short notice of the illustrated supplement, complete this interesting number. The illustration is that of a moonlight effect, the negative by A. Ducros, the phototype by Danesi, of Rome. "To obtain this picture," says the letter-press note, "it was sufficient to set the machine against the setting"—pardon the indiscretion; I was about to add sun—"and to remove the cap. But, before this is done, that certain fifth* sense has to be taken into account," without which,

'Non licet adire Corintum!'†

and Signor Ducros, profound and advanced artist and photographer as he is, possesses this fifth sense, and uses it in a masterly manner."

Prof. O. N. Rood says that the retina of the human eye is so sensitive to the action of light that a flash lasting only one forty-billionth of a second is sufficient to make an impression upon it.

* "Sixth, or do the Italians reckon only four senses?"—Pr. Dev.

† Corinthum.

THE ROYAL ACADEMY OF ARTS, 1890.

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

Gallery No. VI.—Close to the doorway is No. 523 ("When the Flowing Tide comes in," W. Rainey); a jolly lot of little sandboys dabbling their feet in the tide-water, calling to mind some of friend Sutcliffe's delightful Whitby studies, and opens the question of how *he* would have arranged a row of "little lads" just like that? Many a photographer, on seeing such a scene as No. 539 ("The History of many a Winter's Storm," F. Walton), would have said, "there's nothing in it," but Mr. Walton has contrived to "knock a picture out of it." N.B., No. 540 ("Viaticum," J. M. Price) just at first glance reminds one of the photographs one sees of the much-talked-of "Angelus," by J. F. Millet. The picture before us represents some two or three peasants, presumably French, kneeling and watching the "Priest" passing in the distance on some errand of mercy—perhaps conveying the last sacrament to some departing member of his flock. It is a work in a low key, cool in grey, subdued tint, and worthy of careful study.

No. 543 ("A Stranger," N. Garstin). Pose of the two children is note-worthy, but the picture reminds one somewhat of the "two-negatives'" effect.

No. 551 ("The Death of Cleopatra," Hon. John Collier) is quite the big thing of the gallery—should be seen from a considerable distance—in fact, is best seen from just without the opposite doorway. The texture and cold surface polish of the two colossal gods of dark green granite or syenite, is admirably rendered; perhaps the colouring of the pillars is somewhat raw, the general parallel trend of the seated figure, and the dead one on the floor catches the eye; also the elevation of sternum of the dead Cleopatra, over whom is spread a delicate diaphanous drapery, showing the modelling of the figure in a very masterly way; altogether a fine picture, and one from which much may be learned.

Close by the door (and also near the floor) are three small pictures, well worth looking at, viz., No. 583 ("The Edge of the Quarry," T. T. Rowe); No. 584 ("Windsor Castle," W. Fitz); No. 585 ("A quiet pool," A. Lawson).

No. 582 ("Thunder Clouds," A. W. Williams) is also a very creditable rendering of a by no means easy subject.

No. 604 ("A Grey Day," A. Hulk), might well have been greyer still.

No. 632 ("In old Kent," R. W. A. Rouse), is well worth the attention of the photographic eye. Note the admirable rendering of that bit of chalk or clunch quarry.

No. 646 ("A Lantern Manufacturer," E. Docker); a clean faced urchin manufacturing that ever-favourite ghost producer—a turnip lantern. A picture showing good, honest, straightforward painting, and of which, perhaps, the too clean face of the "manufacturer" is the least satisfactory. Before leaving this room, Nos. 524, 542, 553, 560, 562, 571, 599 may be looked at, and several hints gathered, and, as Captain Cuttle would advise, "when found make a note on."

Gallery VII.—No. 658 ("Resurgam," H. Swanwick). A lone dead body of a toiler of the sea, washed up by the tide. Truly a gruesome subject, not the sort of picture many people would select as a daily companion at the dining-table; yet, withal, not without some charm in its rendering of air and soft morning dawn-glow.

No. 672 ("The Silent Evening Hour," B. W. Leader, A.). Here is an answer to the familiar question, "What's in a name?" Who can deny that a first impression is often

(though, perhaps, unjustly and unconsciously) influenced by a name? The title (often enough very misleading) tempts many a one to buy a book. Here is a poetical title of a poetry-yielding subject. The old homestead of red brick and thatch, surrounded by uncultured patches of gorse, affording glorious shelter for the rabbits out to feed at the "evening hour," the crows returning home, the sky all a-glow with warm, rich golden light; all put together with "Leader-esque" skill, and conveying much in the way of hint and suggestion.

Above is an utter contrast, No. 671 ("The Dock Strike," D. Hardy). A vivid reality of life, and a creditable rendering.

No. 695 ("Highlands and Islands," Keeley Halswelle). The title reminds one of "spelling-bees" and Peter Piper of pepper-corn fame. The rainbow seems much nearer than is usually seen, and so also do the clouds. This picture comes rather as a puzzle, and bewilders one in trying to find a satisfactory place to start from.

No. 699 ("A Gem worth polishing," C. Calthrop). The gem is a country lad with a turn for "fiddling," discovered by "The Squire" in a humble cottage. There are several points worth observing and remembering, both in the matter of pose and lighting, although the four figures placed at the four corners of a "lozenge" is somewhat formal; and there is, perhaps, a more than pleasant scattering of the lights and darks.

No. 701 ("Golden Autumn," G. N. Langlands), No. 706 ("Pulling Turnips, &c.," M. R. Jones), and No. 723 ("Turnip Field," J. H. Inskip), are all most suggestive to the camera-artist, well worth careful study for hints in the general arrangement of subject and tone, whereby homely subjects are made attractive by the way in which they are treated.

No. 726 ("Undine," R. Lehmann). This calls to mind 81, and if, after seeing that picture, there lingered any doubt, this (726) is quite conclusive that there are "*many* more fish in the sea, &c."

No. 708 ("Mount Etna from Taormina," John Mac Whirter, A.) must not be passed by without careful study. Stand back a couple of yards or so and observe how the feeling of distance is given by the gradual suppression of minute "f-64 detail"—how the contrast of values is subdued in the receding distance, as the shadows are filled more and more with diffused light, and observe, too, how certain parts (planes) in the middle distance are more sharply defined than some of the nearer or more distant ones. Note the high key in which the scale of tones is pitched, and how the azure waters melt into the prismatic purples and greys of distance. All of which go to show that there are "many ways to choke a dog"—pardon—to paint *a picture* without tying the mill-stone-like tenets of *any* school about one's neck. Before quitting this room, No. 719 ("Dawn," S. E. Waller) must be inspected, although lying somewhat out of the photographer's range, yet it is most desirable that he should contemplate good work of any and every kind. The picture carries us back a century or so to a country garden at early dawn, and the guests, who have "kept it up" till "daylight doth appear," are departing in the combined light of carriage-lamps and dawn. A couple of lovers in the foreground "linger in sweet moments." There is much admirable work to repay careful study, even to the delicate gossamer, "as fresh as morning dew distilled."

Gallery VIII.—The first picture on entering Gallery viii. is No. 758 ("The last Blessing," C. Tayler). Stricken unto death lies a wasted form, tendered by a trouble-worn mother, a hardy-handed, tender-hearted father, and the priest in absolution conveying the last blessing of Mother Church, conjuring up a fearfully, awfully real scene of love and sorrow; the whole, painted in a low key, in harmony throughout both in tint and tone with the sentiment, producing a picture of great power. The face of the father—honest fellow—is a fine study.

No. 775 ("How Lisa loved the King," E. B. Leighton). See previous note on open mouths, as though to represent singing without the sound. The pose of the listeners is more listener-like. The texture of the marble is not quite satisfactory.

No. 781 ("The Angry Sunset, &c.," R. Jobling) is a nice, simple, airy picture, broadly painted in pleasing harmony—sunny yet not gaudy, conveying the feeling of open space rather than specific detail.

No. 792 ("Tired Out," P. E. Stretton). It is not often, perhaps not often enough, that one sees pictures of this "interior dimly lighted" kind, and this one comes as a relief, inviting and also repaying careful examination. An anxious mother watching beside the bed of a fever-worn, tired-out sleeping child, in a room but dimly lighted by a glowing fire and candle, in the small hours of dark night. There is no oppressive detail, but everything is seen when looked for, yet nothing catching the eye to carry it away from the leading theme.

No. 794 ("Rifle Match," E. Crowe, R.), brings to mind the hand-camera-out-for-a-bank-holiday; at first sight a little anxiety arises as to whether the "shootist" is aiming at a blade of grass about six feet away.

No. 821 ("First Snow," F. W. Meyer). A town dweller might be disposed to condemn this picture as too raw, but it is not by any means an out of the way effect as seen by those who live in the country all the winter round.

No. 744 ("Seeking Sanctuary," R. Hedley) must be seen from a distance—across the room—and all diffused light shaded off from the eyes, when the moon-lit Norman doorway and iron work of later period comes up well, but the man's face seems somewhat over lighted.

Gallery No. IX.—No. 830 ("River Camel," W. Llewellyn) points the moral of the too great squareness of a 10 by 8 plate, and the patch of thin emulsion towards the middle is an unpleasant reminder, but the clouds are nice and soft, not painty, but airy as clouds should be.

No. 842 ("Bathers," E. Stott), brings up again to mind the old conundrum "How big should the wafer be on the negative to represent the size of the sun?"

No. 846 ("Frosty Morning," F. Whitehead). A capital version of what is seen (and felt) often enough in the fens.

No. 857. ("Net barking," F. S. Richardson). Excepting the sky, this picture is one to please and instruct.

No. 866 ("On the Temple steps," E. J. Poynter, R.A.). This, at first glance, suggests the question, Was the painter here trying to see how many different patches of differing colours it would be possible to work in together? Pink, red, lake, crimson, yellow, greens, blues, purples, &c., and flesh tints. The part which seems to come out of the encounter best is the legs below the knee, and the inscription-bearing marble slab behind them.

No. 888 ("Twilight," C. W. Wyllie) is a nice, quiet, cool, grey moonrise, with the "blue band" of a distant fog, with which the fire-smoke and fire-lights blend pleasantly.

No. 895 ("Washing Day, Newlyn," H. L. Norris)

seems to run somewhat too far into the low-toned end of the colour octave. It does not require any great effort of the imagination to fancy a brighter, whiter, and lighter froth of soap-lather, for instance.

No. 890 ("Lava mea ab iniquitate mea," A. Lonza) is a jolly picture, a "tale well told." An old monk drawing an obstinate cork from a wine flask. The expression on his feature-drawn face may suggest more than one "wrinkle."

The "hangmen" were, perhaps, "cruel to be kind" in hanging No. 913 ("Water Meadows," J. L. Bernard) and No. 914 ("Malvern," J. Ehrke) one above the other. We have here and almost "in a nutshell" the "focus *versus* fuzzy" question. It is well worth while for photographers of both or any "school" to look at these two from a little distance, and also as near as he can get, and then think a bit for himself and see if he cannot see some recommendation in the writer's favourite motto, "via media, via tuta."

No. 972 ("Fresh from the Altar," J. Hayllar). A very remarkable piece of fine detail painting, representing more painstaking skill than some of the big brush school would credit, and instances admirably the lesson that one subject may find fitting expression in a method which would be utterly fatal to one *partially* similar.

Gallery X.—In this room the pictures which are most likely to repay the observant visitor are No. 996 ("Portrait," M. C. W. Flower), *vide* also No. 635 by same artist; No. 1,016 ("Waiting for the Train," J. H. F. Bacon), a sweet, thoughtful face painted with great sympathy; No. 1,009 ("Brunswick," V. P. Yglesias), a quiet bit of N. Yorkshire; No. 1,042 ("Three miles to the Fair," C. Hayes), perhaps the most truthful rendering of snow in this year's collection; and No. 1,028 ("The 9th of November," W. Logsdail), a picture which makes one say Oh!

Gallery XI.—No. 1,090 ("The Young Wheat," David Murray) will certainly repay careful study, and is the kind of subject open to the country photographer. Observe how perspective of the parallel lines gives feeling of distance, and how the lines of the clouds assist in giving also the feeling of space—the open air effect so seldom sufficiently conveyed.

No. 1,146 ("By order of the Court," S. A. Forbes). One of the leading pictures of the year; contains *many* hints which space does not permit being given at length, but must not be passed over without careful study. There are also several other pictures to be carefully examined, viz., No. 1,076 ("Perseus and Andromeda," H. S. Tuke), No. 1,104 ("October Glow," A. East), No. 1,111 ("Last Load," B. Gast), No. 1,112 ("Chip of the old block," W. B. Fortescue), No. 1,113 ("The Ferry," W. Osborne), and No. 1,140 ("Roman Holiday," F. M. Skipworth).

The Architectural Room calls up numerous interesting questions both as to interior and exterior work, and therefore will repay a visit. The "Black and White" and also Water-colour galleries are obviously abounding with lessons and hints, which space does not permit one to enter upon; and the question of the bearing of photography towards the revival of miniature painting and growing attention recently given to "burnt-in enamels," must all be reserved; but most reluctantly do we relinquish our study of, perhaps, the most difficult branch of art, viz., sculpture, but a branch which no real serious and truth-seeking art student can afford to neglect.

HERR H. F. R. VOIGTLANDER, of the firm of Voigtlander and Son, has, it is reported, been knighted by the Emperor of Austria.

ETHICS OF PHOTOGRAPHY AND PHOTOGRAPHERS.*

BY J. TRAILL TAYLOR.

A FUNNY instance of slightly unethical behaviour comes to my recollection. The once well-known Marcus Sparling was intent upon taking a stereoscopic view of an old house in the Edinburgh Cowgate, but, when the light suited, the street was usually full of boys just out of school, who invariably persisted in standing in front of his camera. In this dilemma he applied to me for advice, and, as a consequence, the next day found him with a huge, highly-polished French portrait lens attached to the *back* of his camera, and pointing in the direction opposite to that where stood the coveted old house. This time the boys, true to their instincts, posed in front of the showy lens in the rear, and stood still patiently during the three or four minutes (these were the days of long exposures) required to get the building photographed. This may be off-colour from the ethical standard, but what was one to do under the circumstances?

Here is a view, fully exposed, taken of a railway carriage when the train is certified by the engineer as having been going at thirty-five miles an hour, and yet every one of the occupants of the compartment is sharp and distinct. As the story stands it is simply a marvel, but "seeing is believing." Where the ethics come in is the withholding the explanation that it was taken from the window of a carriage in another train, which, on a parallel track, was moving at the same rate of speed, and when, consequently, one was motionless as regards the other—a phenomenon that can be witnessed every morning, about nine o'clock, between Finsbury Park and Holloway Stations, on the Great Northern Railway.

Double printing, when practised by one imperfectly skilled, may prove a fertile cause of departure from truth. Clouds of a nature totally inadequate to the character of the scene may be introduced. The foreground of a picture may be Indian, and in the distance may be seen the Crystal Palace with its Sydenham surroundings. One of our members has, by way of joke, introduced in a view in Epping Forest an alligator disporting himself by the bank of one of its pools; but many things equally non-natural are sometimes to be discovered in a combination photograph. Thus, we have the incongruities arising from the attempts to combine, in one picture, pieces of landscape or incidents taken with lenses the foci of which are widely different. Not only so, but we have in one inharmonious whole parts of views lighted differently from each other, and as many kinds of perspective as there are elementary parts in the finished result. I have seen in a pseudo-moonlight photograph the orb of night printed the size of a threepenny piece, when that of even a split pea would have proved too great. Nay, I have, and you all have, seen moonlight photographs in which the dominant light fell upon the objects from a point thirty or forty degrees to one side of the position of the full moon by which the scene was supposed to be illumined.

The mere mention of photography in the law courts will recall an incident narrated by one of our members a few years ago. It was a case of ancient lights, and in the morning he, as a well-known professional, undertook the task, in the interests of the plaintiff, to show by truthful photography that the erection of a building then in progress would most certainly cause a serious obstruction of

* Continued from page 376.

the light. He did his work to the satisfaction of the solicitor, and received his well-earned fee. But next morning the solicitor for the defendant employed him to establish the fact by truthful photography that by the erection of the building in question no light whatever would be obstructed. He effected this, as in the previous case, in a satisfactory manner, and received his fee. He, doubtless, reasons that there is no more immorality in this than is reputed to be found in the daily practice of legal or patent experts, and other counsel, who give "opinions" usually favourable to those by whom their advice is sought. Nor is there.

A humorous application of *mal* ethics in photography is to be found in the photographer in an agricultural district, who had often occasion to take negatives of cattle and horses. He overcame the difficulty so often experienced of the animals whisking their tails and spoiling the exposure, by the ingenious expedient of keeping a large and various assortment of negatives of cows' and horses' tails, from which he selected one that matched that of any given specimen, and printed it in, having previously stopped out the original that was blurred by motion. This suggests the practice of the photographer in the military town, who kept a stock of well-taken figures in uniforms, but minus the heads, which he supplied from those of the gallant patrons of his studio. And this in turn suggests mention of a practice, horrible in its abomination, which, more than twenty years ago, was—happily not frequently—adopted by some foreign photographers, of printing the heads of respectable ladies on the undraped bodies of some of the same sex to whom this qualifying term could not possibly be applied. Of all ethical sins in photography this one was the vilest, as the junction of head and figure was so perfectly effected as to deceive even photographers themselves.

And dry-plate manufacturers, what of them? Are they ever guilty of practices contrary to ethics? Honestly I believe they are not. The day has long gone by since any manufacturer sought to utilise his waste or "shady" plates by inserting two or three of them in every dozen package of good plates. Happily, this system, being suicidal, quickly effected its own cure, so it no longer exists.

"Borrowed plumes" is a term which covers several departures from the strict ethical path. I allude particularly under this heading to professional photographers who display in their show cases as their own work that which has been executed by others; and also to amateurs who, buying their plates ready prepared, get their developing, printing, mounting, and finishing done by others more skilled, and then exhibit, and possibly obtain medals for it, as their own work. A case is on record in which this was carried to an extreme, for not only was all the foregoing done, but it was done with a borrowed camera, and an artist present had indicated the spot on which to erect it, and the exposure to be given. Well might the narrator ask *who* of all these should have got the medal that was awarded the picture made under these circumstances?

I have mentioned an amateur of one type; there is another, viz., the one who, posing as an amateur, yet enters in some respects into pecuniary competition with the professional, doing work for his friends and such of the public as apply, at so-called prime cost—that is, cost of material—thereby in many cases depriving the man who has to subsist by the exercise of his profession of his means of living. On the unfairness of such a proceeding it is not necessary I should dilate, especially as it is not unethical, and does not come properly within the scope of my subject.

Photographic authors and writers do not usually lend themselves to the encouragement of departures from ethics, but Elbert Anderson, in his book, "The Skylight and the Dark Room," is not so fastidious. He advises that, even "if your sitter sits still and has a good expression, but upon developing the negative you find you have committed a blunder, rush out of the dark room, and tell him with a bold face that he *moved!* *You* must never be in the wrong; it must always be *his* fault."

Over a month ago I was discoursing on stereoscopic photography at another Metropolitan society, and after speaking of the expedient that had to be resorted to when photographing the moon, namely, taking advantage of her librations, and thus increasing the stereoscopic base from the two and a half inches between the eyes to many thousands of miles in order to show her in the stereoscope as the spherical ball we know her to be, and by parity of reasoning I adduced my own experience in photographing a coast line from the deck of a yacht, allowing a space of a few hundred yards between the shots in order by such abnormal displacement to show every creek and jutting headland as they existed in nature, although undecipherable in the monotonously straight coast line as seen by the eye. It was objected that this was not truth. Not, perhaps, as a representation of what the eye saw at the moment, but literal truth all the same. This expedient is an aid to vision on the same principle as looking through a telescope to see an object at a range too great for normal vision, or photographing by microscopic aid an object otherwise altogether invisible.

But mention of the stereoscope suggests malpractices with it which are altogether contrary to ethics. For instance, trimming pictures so as to impart a fictitious acclivity to a railway ascending a mountain which is already fairly steep in itself, as practised by a well-known photographer; or making a stereoscopic pair of pictures from one and the same negative, by which they undoubtedly coalesce when viewed in the stereoscope, but which are devoid of relief.

"Dodges" are not necessarily antagonistic to ethics. They are generally expedients for expediting the means to the end. Many of them could be mentioned were it desirable or necessary.

Do not look upon me as hypercritical in regard to the latitude permissible to photographers. All things are or may be lawful; the expediency thereof must be determined by circumstances. Let photographers practise every conceivable dodge that they can think of, and no offence against the strictest code of ethics will be perpetrated, so long as it is not done, to quote Truthful James, "The same with intent to deceive."

DEVELOPING FLASH-LIGHT NEGATIVES.—A word as to the developing of flash-light pictures. As nine out of ten are hard, the best method, in my experience, is to give them as little pyro or eikonogen as possible, so that the detail will have time to appear, and after detail comes up, and the high-lights are thin and translucent, apply full strength developer until the negative is strong. In this respect a flash-light picture is like a snow scene, easy to take, but difficult to develop.—C. M. COHEN.

Notes.

The French police are nothing if not methodical. When the May-Day demonstrations were feared in Paris, several of the leading capitalists and financiers received threatening letters. These letters were all photographed carefully, and submitted to experts for the purpose of ascertaining if they had been all forwarded by the same person, or "group" of agitators. Why these letters should have been photographed, instead of the originals being submitted to the experts, we do not understand; but doubtless the police know why. Perhaps it was necessary that the official photographer should be kept employed.

Our reference to the absence of photographs of the interior of the Tower, and especially the Beauchamp Tower, has attracted the notice of the daily press. The *Daily News* quotes with approval; the *Globe* with a reservation. The *Globe* agrees with us that the cause is partly due to the "array of ceremonial" with which the Tower is hedged round, but urges also that "in the first place the light in such places is very bad, and the position of prisoners' inscriptions is often very awkward." But the badness of the light is, in these days of magnesium powder and sensitive dry plates, no obstacle at all, while there are no inscriptions save those in the passage—the most interesting of which is that of Robert Dudley, Earl of Guildford—which present any difficulty. "It is, besides," adds our contemporary, "possible to attach too much importance to such relics of old days. Some of the inscriptions are, beyond doubt, genuine, and are often deeply pathetic. But it is not quite certain that imaginative custodians have not fathered them upon imaginary authors." This may or may not be, but the question of authenticity is not one which the photographer is called upon to decide. Meanwhile it is pleasant to see that the subject is deemed of sufficient importance to draw comments from two of the leading London papers.

It is now, we read, the fashion for barristers' chambers in the Temple to be ornamented with pictures of various "bits" of the Inn, both interior and exterior; while it is almost *de rigueur* that on the walls should be hung portraits of judges and other legal celebrities. This possibly explains why the photographs of the luminaries of the bench and bar can be so readily purchased; otherwise, one would think the sale of such pictures was so small, it would hardly pay for the trouble of keeping a variety. In regard to the pictures of the buildings, these, it appears, are mostly water-colour sketches and etchings, a series of the latter being now in process of completion. It is curious that photography has been made use of to such a small extent as it has in regard to photographing the Inns of Court. The briefless barrister—and his name is legion—might do worse than employ his idle hours in photography. Yet, so far as we know, few of them have taken up the art.

Even those who have, appear to have done so in a perfunctory spirit. Witness Mr. Stavely Hill's experience. Mr. Hill paid a visit to Canada some time ago, and took with him a camera and a number of double backs. In crossing the Atlantic, the ship encountered some icebergs, and Mr. Hill promptly brought out his camera and made six exposures on the frigid monsters. On his return home, the backs, with their contents, were handed over for treatment to a professional photographer, who, on opening the slides which it was supposed contained the precious negatives of the icebergs, made the unpleasant discovery that the whole six were empty. Instead of filling the slides himself, as a genuine amateur would have done, Mr. Hill trusted to the dealer of whom he had bought his apparatus, and, by some carelessness, the assistant had omitted to fill some of the slides. It was exceedingly unfortunate that Mr. Hill should have picked out the empty slides, because he was particularly anxious to obtain a picture of an iceberg; but in photography 'twas ever thus. It is always the cherished picture which comes to grief.

Not enough notice has been taken of the phenomena which found publicity, not in the photographic but in the daily press, of the efficacy, photographically speaking, of thunderstorms. We were told of two instances of photographs in natural colours. One occurred during a photographic lecture at the Polytechnic, when a violent thunderstorm arose, with the result that a coloured image was imprinted, not upon the plate, but upon the lens. In the other case, a lady clothed in a black dress checked with green, red, and a narrow yellow stripe, was sitting for her portrait. When the thunderclap had burst, and the lady had scampered away in fright, the operator developed, and found, to his astonishment, "a beautifully delicate, naturally-coloured Daguerreotype." We do not like to doubt the veracity of anyone, and least of all the veracity of a photographer; therefore, although we have not seen either the "lens" or the "Daguerreotype," we would not say such things have not been.

The point we would like to enforce upon photographers is the desirability of not allowing a thunderstorm to slip without trying to utilize it. Warm weather has now been with us for some time, and the probability is that thunderstorms will follow. The proper thing, therefore, to do is, directly thunder and lightning make their appearance, to rush to the studio with a sitter who is not nervous, and begin taking photographs one after the other. Benjamin Franklin got a good deal out of a flash of lightning with a homely umbrella, and we do not see why the photographer should be less successful with a camera.

Architects' drawings look very pretty, but do not gain by being photographed. Photography has a knack of exposing their weak points, and, as a rule, make them ridiculous. An American paper having published the photograph of the architect's drawing of

an hotel to be erected in Mexico, a Mexican journal favours its readers with the report of its special artist upon the photograph in question. The expert, after severely criticising the building, says:—"The only redeeming feature I was able to discover in the photograph are three mops on the right hand side of the building, and two on the left-hand side. I suspect they are meant to signify palm trees, as a homage to the tropical character of Mexico." Severe, but, we doubt not, truthful criticism.

Now that the optical lantern is taking such a prominent place in all sorts and conditions of work, it will not be out of place if we refer to a possible application of it which may not have occurred to those chiefly concerned. We refer to the aid which it might render to the theatrical scene painter. The usual course in painting a scene is to first of all make a small sketch of the composition, and then to rule lines across it so as to divide it into squares. Similar squares are then "struck" by charcoaled string on the large primed canvas as a guide to the artist, who then reproduces the sketch in its enlarged form. Now, of course, all this work would be greatly hastened and simplified by photographing the original sketch, and throwing the image of the negative on the whitened canvas, so that the scene painter could follow the outlines with charcoal or brush. With a lens of good definition, and with a simple form of lime light—always available in a theatre—the thing could thus be easily done. In painting-rooms of limited area, there might be a difficulty in finding sufficient space for the lantern; but there would even then be the alternative of making the enlarged sketch on the stage itself.

In the old wet-plate days, developing dishes were unknown. The liquid was thrown over the glass as it was held by one corner between the fingers, and the image showed itself almost immediately. But now a dish is necessary, and, with many developers, rocking that dish becomes a necessity if we wish to avoid unequal action on the film. We can of course rock the dish by simple manipulation; but those good people, the dealers, whose province it is to save us all trouble, and who will, if we wish, do everything for us save exposing the plate to the action of the lens, have devised several ingenious rockers. The pendulum has until now been the usual principle of this arrangement; but Mr. Hinton showed us the other day an extremely neat contrivance, by which the rocking is done by clockwork. The apparatus consists of a neat box, with the clockwork inside, acting, like a watch, by means of a coiled spring. It gives movement to a metal platform above, upon which a developing dish may be placed. After being wound up, the platform will execute a see-saw movement for about five and twenty minutes.

Although the season for flash-light photographs is now past for the present, we may call attention to a new form of light of this description which lately formed the subject of a communication to the Washington Chemical Society. Dr. Thomas Taylor, of the United States Department of Agriculture, was the originator and exhibitor of this new aid to photographic work. The magnesium powder is associated with charcoal made from the silky down of the milk weed—a form of carbon so pure, that it leaves no ash. A little of this composition placed on tissue paper, and fired, produced a flash which was so instantaneous, that enough heat was not developed to scorch the paper upon which the powder rested. We well know that this is not the case with several of the more or less dangerous mixtures which have been recommended for flash-light purposes. Many of these not only set fire to the surface upon which they rest, but scatter burning particles around, and behave generally like a small volcano.

If there be such a man as a photographer who is puffed up with an inordinate opinion of himself, he can very easily get the conceit taken out of him by studying one of the boards placed by the London County Council at the entrance to all parks and open spaces under their control. Inspection of one of the regulations will speedily convince the reader that the L.C.C. does not think much of camera-bearers in general, for they are classed with itinerant showmen, gypsies, and other hangers-on of open air existence. The particular regulation to which we refer prohibits all kinds of amusements dear to holiday folk, and numbers among them the innocent tripod stand and its belongings. The section is thus worded:—"Erecting or placing in the Park any post, rail, fence, photographic apparatus, cocoanut, stand, swing, or any building, erection, or obstruction of any kind whatsoever."

Shades of Daguerre, Niepce, and other departed ones, who laid the foundations of our art science, hear how your followers are treated by officialism in this year of grace 1890! They are classed with cocoanut throwers at "three shies a penny," with Aunt Sally, with round-abouts, with erectors of swings, and with all that wandering class of irresponsible persons who, in the old days of fairs, used to live in an atmosphere of gilt gingerbread and flaming naphtha lamps. But perhaps, after all, this is a little joke on the part of the newly elected Council, for certain it is that if proper application be made to their Secretary, he will recognize the claims of the ubiquitous photographer, and will grant him the necessary "open sesame."

A single permit to photograph, issued by the County Council, holds good for all the parks and open spaces under its control. In Battersea Park will be found a few scenes which make excellent photographic pictures, since there the authorities have been to some little expense in the production of artificial rockwork and waterfalls; the rocks are now so mellowed with age, and covered with vegetation, that nature unadorned seems to rule throughout. Some of the trees in the park are sub-tropical; they are moved and kept under glass during the winter months.

PHOTOGRAPHIC EXHIBITIONS.—No. I.

BY GEORGE DAVISON.

Exhibitions are taking a prominent place in photographic history. The causes of this growth and extension are not far to seek, and their influence may be readily traced. Just at present there is a revolt against the greater part of the system in vogue, and what were a few years ago regarded as unpopular and fanciful reforms now promise to be taken up and generally adopted. This ready surrender is probably attributable to the vast increase in the number of exhibitions and to the frequent absurdities and inequalities which have resulted from the application of an unsuitable code of regulations.

Recently I happened to hear a photographer of long standing complain that there was nothing but exhibitions talked about and reported, so much so that he did not care to read the journals. He was a worker of the older school; one whose delight was in processes and the mechanical practices of photography, and, probably, it would be impossible for such an one to appreciate the highest objects of such exhibitions, or the motives which actuate those whose anxiety to place the whole system on a higher level finds such frequent and earnest expression. The chief interest which has been taken from the first by photographers in the work of these exhibitions has been as to what new wonder or scientific excellence they brought before the public. The whole was looked upon and judged by scientific standards and conventions. It has taken a considerable time and experience to teach the lesson that there must be a wide separation of artistic and scientific applications and results by photography. An understanding of this distinction is essential as a foundation for the framing of what will probably be the future regulations for photographic exhibitions.

Photographers have been misled by the conventions, or absorbed and distracted by the business of photography. They have been faithless and disloyal to their art, and have distrusted its power for anything beyond what they had themselves done. But there has been growing a belief in higher art possibilities for photography, and, in spite of some strenuous attempts to impose unnecessary limitations, there are a good many photographers who are enthusiastic in assisting whatever may prove or extend the capabilities of photography as a means of artistic expression. It is this latter influence which is responsible for much of the desire for exhibition reform which is now so prominent.

The question to be considered is what regulations and conditions are required for an art exhibition. The general characteristics and requirements of pictorial art must be considered and made the test. If this be done without prejudice, the difficulties concerning regulations very greatly vanish. The way is clear. Where struggles concerning detail arise, they may be traced to an attempt to compromise with old prejudices, the domination of standards, or the exigencies of popular vulgar taste and craving for excitement. So far in general terms. In subsequent articles this test will be applied to some of the difficulties which arise and are very generally discussed.

There are some interesting points in connection with early exhibitions which may well be referred to, as naturally leading up to a consideration of affairs as we find them to-day. Exhibitions are responsible for the prosperity and even for the existence of some photographic societies. The foundation of the Photographic Society in 1853 is greatly attributed to the influence of the Great Exhibition of 1851, for the *Athenæum* of March 13th, 1852, refers to a proposal which was before them for the formation of a Photographical Society, which, they state, originated in the "meeting of the professional and amateur photographers from various countries whose pictures were shown at the Great Industrial Exhibition of 1851." This proposition had for some time been "hung up" on account of the difficulties attending Fox Talbot's patent rights. More directly, too, the exhibition of photographs "by the most notable professionals and amateurs" at the Society of Arts, in December, in 1852, as described in "Notes and Queries" of that year, had an influence in stimulating the enthusiasm and warming up the sympathy which pressed forward the movement, which had in 1851 received so much impetus by the showing of Dr. Diamond's specimens at Lord Rosse's *soirees*. At the exhibition held at the Society of Arts, it may be noted that the admittance was 6d. each, and that certain ladies greatly distinguished themselves by their exhibits.

From the first the Exhibition of the Photographic Society took leading place. Some of the early regulations of the exhibition of January, 1854, are given in that Society's Journal. These were very simple and general, the most interesting being a grandmotherly restriction as to amount of margin desirable and allowable for the photographs, and a rule that "prints from touched or painted negatives must be described accordingly." These exhibitions were well supported. It was announced that 1,000 pictures were included, and this is about as many as are received to-day. Further, the gallery was open to the working classes in the evening at a charge of 3d. each. In February, 1854, the Devon and Cornwall Photographic Society had its first meeting at St. George's Hall, Stonehouse, in connection with a small exhibition and *soiree*, which was "attended by all the most distinguished people in the neighbourhood," and at which "photographs were taken by artificial light in the presence of the company." This may be taken as typical of the frequent local societies' inaugurations of recent days, though more prosperous sounding than the reports of these latter meetings.

As the societies multiplied, so did exhibitions increase. There was mutual action and reaction. A writer at the date remarks that the exhibitions mostly take place at the same time, and the bewildered exhibitor scarcely knows where to astonish the public gaze with his "pet productions"—a very exact anticipation of the remarks which have been so freely heard of late. Manchester had its first annual exhibition in May, 1856. The Bombay Society, with over one hundred members prior to April, 1855, had its exhibition and Journal, and a class in the Elphinstone Institution for instruction in photography. Brussels, also, had an exhibition in 1856, and we find the International Photographic Society at Amsterdam giving medals about the same period. With the institution of such societies as Liverpool, Dublin, Birmingham, Norwich, Brighton and Sussex, Maulmain, Bengal, the Société Française, and the Photographic Society of Scotland, exhibitions very naturally grew and extended. As might be expected, it it was not, however, until the dry plate became established, that the multiplication of societies and exhibitions became phenomenal. These exhibitions are found to popularize photography, and to advertise and give a stimulus to the societies organizing them. Sympathy, emulation, and business enterprise, all combine to ensure large and prosperous shows. In the multitude of rival exhibitions, those responsible for their management have thought it

necessary to devise fresh allurements every time to attract a large body of exhibitors. The result of this has been, in this age of absurd competitions, a multiplication of prizes and an exclusive consideration of what would ensure a large crop of frames and a commercial success. The spirit of competition has for a time affected photographic exhibitions in an astonishing manner. Exhibitors have been led to give themselves entirely away in the scramble after prizes which could carry no real honour. Even the judges have been too anxious to accept what seemed to be the superior distinction of deciding upon the respective merits of well-known competitors. Now, however, there is a strong tendency to scrutinize regulations before consenting to be associated therewith, and there is also a fair prospect of exhibitors, judges, and exhibition authorities combining to better the present state of things. There are already satisfactory signs in the announced regulations or proposals for forthcoming exhibitions at home and abroad, to which reference will be made in further discussion of this subject.

PHOTOGRAPHY IN FLORENCE.

The *Camera Obscura*, a monthly review connected with the progress of the art of photography, and published under the able direction of Professor L. Borlinetto, with Germano Salvi as editor, and an efficient staff of collaborators, contains, besides articles on the development of the latent image, and on the formation of composite pictures, a notice of the Italian Photographic Society, which holds its meetings in Florence.

The last general meeting, on the 11th of May, was presided over by Professor Golfarelli, on account of the lamented indisposition of the president. Thirty new associates were admitted. After the transaction of the usual necessary business,

The President gave a demonstration of the perfection gained by Italian makers of gelatino-bromide plates, such as Melazzo, of Naples, Cappelli, of Milan, and the recently established house of Semplicini, in Florence.

Signor Paganori then spoke, in a few moving periods, of the death of the late able and well-known member of the Society, Giuseppe Alinari. The great loss experienced by the photographic world in the decease of this accomplished artist is further touched upon in the necrology at the conclusion of the *Camera*. It is there stated that Alinari, who gained for the establishment over which he was the technical director numerous national and international prizes, was born on the 29th April, 1836. He was a pupil in the Infant Asylum founded by Guicciardini, and entered while yet extremely young the house of Falcini to study the art of inlaying and mosaic. His brother Leopoldo, having taken it into his head to become a photographer, made some successful early attempts, and was encouraged by Giuseppe Bardi, who had chanced to see his work, to continue his labour, and ultimately opened a small establishment on the ground floor of a house in the Via Cornina, taking as his assistant his brother Giuseppe. This happened in 1853. By degrees he was induced, through his increasing business, and by the advice of his friends, to add to his little shop a chamber for taking portraits. But this was in its turn found insufficient, and Leopoldo having acquired some ground in what is now called the Via Nazionale, there erected a large and imposing building, which was not completed till 1862.

The photographic labours of the brothers Alinari were soon so highly appreciated, not only in Italy but in other countries, that amongst the many important commissions with which they were entrusted about this time, must be reckoned that of the Archduke Alberto, who, in addition to requiring a reproduction of a part of the designs in the Royal Gallery of the Uffizi, also desired that the brothers Alinari should betake themselves to Venice, and after that to Vienna, in order to execute some designs which he had chosen there for photographic representation.

On the 9th November, 1865, little more than two years after the inauguration of his new establishment, Leopoldo ceased to occupy himself therewith, leaving the care of his two infant orphans to his brothers Romualdo and Giuseppe, giving the former the general administration, and the latter the technical direction of his well-established house. It was then that the earnest activity, the noble unselfishness, and the artistic intelligence of Giuseppe Alinari made themselves chiefly conspicuous.

Ever ready to work, always at his post at the proper time, apparently unwearied by labour's fatigue, he effected in a few years by his own unassisted endeavour more than the result of the united forces of many excellent photographers in Italy and elsewhere.

The frescoes of Santa Croce, executed for the Duca di Luynes, those of San Miniato, executed for the same patron, the chapel of Brancacci al Carmine, the frescoes of S. M. Novella, and those of the Palazzo Riccardi, of the Sistine Chapel at Rome, and a thousand other works, all of extreme difficulty, were undertaken and completed by Giuseppe Alinari by means relatively weak and poor, seeing that at that epoch the great universal panacea, the gelatino-bromide of silver, which has transformed countless "fools" into photographers, was not known, but recourse must then have been had to wet collodion, in the use of which so many modern photographers have encountered almost insuperable difficulties.

Being such a man as has been described, Alinari was at the same time excessively modest, and rather sought to avoid than to encounter all that might produce for him honour and prizes; nay, he went so far on several occasions as to refuse both when they had been offered to him. It was with no little difficulty that he was at last induced to become a member of the committee for the promotion of the photographic exhibition held in Florence, and of the photographic society, in which he would never accept any mark of exceptional honour or any post of unusual distinction.

The later years of his life were spent on the illustrations of a work on architecture, published by Professor Steigmann. To this work he brought so much passion and so great intelligence that Steigmann, in the letter of condolence which he sent to his nephew Vittorio, thus expresses himself:—

"I have just heard of the death of Signor Giuseppe Alinari. What a grief for me! What a loss for art!

"In him I miss a friend, not only to myself, but to my work.

"But all the world may mourn for one who has brought into the hearts of so many a love for the photographic art."

Giuseppe Alinari died the 24th April, 1890.

The Photographic Club.—The subject for discussion on June 11th will be "Paintings as Art Examples to Photographers"; June 18th, "Mounting and Finishing Photographs."

A PHOTOGRAPHIC EXHIBITION AT HEXHAM.

BY JAMES BROWN AND EDGAR G. LEE.

PERHAPS the most remarkable "one man" exhibition ever held is now on view in the Town Hall of the quaint old market town of Hexham, commonly known as "the heart of all England." The show consists of over 400 photographs by Mr. J. P. Gibson, of Northumbrian scenery and antiquities, ranging from whole-plate to 15 by 12, and mostly by the platinum toning process, which, in Mr. Gibson's hands, lends itself admirably to artistic effect.

Mr. Gibson is an ardent antiquarian, whilst as a landscape photographer he has stood in the front rank for many years. The standard of the exhibition is high, and the work shows evidence of thought and tender care throughout. The technique, as might be expected from such a careful worker, is good, except in a few of the architectural subjects, in which the effect of the "harmless" yet necessary wide-angle lens is somewhat unpleasantly manifest.

Whilst some of the subjects possess only a local and archæological interest, they are treated in the same careful artistic manner as his well-known landscapes. Entering the Town Hall, we find photographs illustrating Northumbrian architecture from pre-historic down to modern times, instantaneous street scenes, views of bleak moorlands, and of the sylvan and romantic scenery of the Tyne and its tributaries, which Mr. Gibson has made peculiarly his own. With so many pictures on view, it would be difficult to attempt a lengthened criticism, but we propose to single out a few for special comment.

The 15 by 12 first claim our attention, and a long way ahead stands No. 269, "Autumn Haze," a charming view on the South Tyne, with the distance beautifully softened by a perfectly rendered haze. Another feature of this picture is a choice bit of reeds and rocks, with figure judiciously introduced. Next is No. 267, "Under the Haycock Fast Asleep," in which the foliage in the middle distance is exceptionally fine, and the figures from which the picture takes its title are placed naturally without any straining after effect. In No. 268, "September," we have a reach on the South Tyne, a piece of pure landscape art, with gleams of sunshine playing over the water at the bend of the stream, and a gnarled old oak standing out in bold relief. Coming to the whole-plate series, the task of selection becomes more difficult. Our own feeling is that No. 82, "At Ladle Wells," is the choicest and most artistic *pure* landscape in the whole exhibition. It represents with startling realism a desolate, barren moorland; rushes and burnt heather make up the foreground; two trees, bare and bleak as the surrounding heather, stand out weird against the wintry sky; the whole forming one of the finest and withal simplest pictures we have ever seen. No. 36, "By the Brooklet," is of its kind a gem, which shows how a simple subject may be aided by artistic feeling in placing figures as aids to the composition. In No. 65, "Out for a Holiday," an otherwise fine work is slightly marred by too much white road, which exercises a disturbing effect. In No. 69, "The Beautiful River," the subject does not belie the title; a splendidly balanced picture, with an artistic foreground. No. 159, "The Wind that Stirs the Mere," is another scene of loveliness—a small Northumbrian lake. Here, again, the materials are simple—a crag and a sunlit expanse of water broken up into ripples by the wind, with the foreground and sky—two of Mr. Gibson's strong points—alike admirably treated, so treated, indeed, as to make the picture.

Space does not admit of further individual notice, although many pictures merit it. In this catagory may be included No. 39, "Old Ridley Bridge"; No. 55, "Coastley Burnfoot"; No. 57, "The Lonely Moor"; No. 76, "Hindley Burn"; No. 99, "Tickling the Trout"; No. 342, "Waiting," and No. 222, "The Thief's Tyke." This last is a vigorous subject vigorously treated, larch trees against the sky with a finely-broken up foreground.

The architectural subjects, as subjects, do not call for special comment, but locally, of course, are interesting. The salient feature of the series is the fact that by proper handling, the careful study of lighting, and judicious selection of clouds, what in many cases would have been ordinary photographs are transformed into works of art.

Summing up, the effect produced upon our minds by this unique show is one of unmixed pleasure, and admiration of the thoughtful adaptation of means towards ends displayed in many of the works. We suggest that the Camera Club authorities should at an early date endeavour to secure some of the gems of this collection for one of their "one man" exhibitions.

Notices of Books.

THE Amateur Photographer's Library, Nos. 3 and 4. (*Hazell, Watson, and Viney, London*, 1890.)

EXPERIMENTAL PHOTOGRAPHY.

THIS little book, Number 3 of the series, is written by Mr. C. J. Leaper, a Fellow of the Chemical Society, and contains much elementary information about photographic chemistry likely to be of use to those beginners who have not studied the latter subject. As regards developing room illumination, he is right in recommending a large window, eighteen inches square, for the lantern, but says that it should be of one thickness of ruby cloth; if he examines such cloth under the microscope by means of a strong light on the other side of the fabric, as recommended in another column, he will see reason to alter this advice, and to advocate the use of at least two thicknesses.

Much of the book deals so much with elementary photography, that any criticism of it would be of little interest to our readers; suffice it say, the instructions given to learners are, generally speaking, sound.

Mr. Leaper gives the following instructions for the production of prints of different colours by iron processes:—

If we do not admire the blue colour of these prints, we can readily change it to a very beautiful green by immersing the finished print for a few minutes in very dilute sulphuric acid, about two drops of the strong acid to the ounce of water. Views of breaking waves printed in this manner make striking pictures.

A dark-brown tint can be secured by making use of the well-known reaction between the salts of iron and tannin, a reaction to which the colour of ordinary writing ink is due. To obtain such a brown colour we float the blue print for five minutes on a solution of tannin containing 10 grs. of the substance in an ounce of water, then transfer it to a solution of ordinary washing soda of the same strength, and lastly retransfer it to the original tannin solution, after having washed the print for ten minutes in running water.

A black print can, lastly, be obtained from a blue one by floating the blue print on a solution of silver nitrate containing one grain of the salt to the ounce of distilled water, leaving it there for five minutes, washing the print for about half-an-hour to get rid of every trace of free silver nitrate, and then immersing it in the usual ferrous-oxalate developer, the same, in fact, as we employed with the Eastman paper.

In the preceding processes we have produced blue prints on a white ground, *i.e.*, the unexposed parts remain white, and the exposed portions become blue. The salts of iron can, however, be also made to yield prints of the reverse character, viz., ones in which the exposed portions remain white and the unexposed portions become blue. To understand how this is brought about, we again take some ferrous sulphate and ferric chloride, and add to each a small quantity of a solution of potassium ferrocyanide or yellow prussiate of potash. We shall find that the ferrous salt will yield a light-blue precipitate, changing rapidly to dark blue, whilst the ferric salt will yield an immediate dark-blue precipitate.

If we could exclude from the ferrous salt every trace of the

ferric compound, we should obtain a white precipitate. We can now understand how, by employing potassium ferrocyanide as a developer, we can obtain a print in which the exposed (ferrous) portions remain white, whilst the unexposed (ferric) portions become blue. The solution previously used is not very suitable for this purpose, but the following will yield good prints :—

Citric acid	...	...	...	40 grs.
Ferric chloride	...	...	...	18 ,,
Gum arabic	...	...	...	42 ,,
Water	...	...	...	11 ounces

Soak the gum arabic for a couple of hours in half the quantity of water, and then dissolve it by placing the vessel in a warm place. Meanwhile, dissolve the citric acid and ferric chloride in the other half, and mix the two solutions. The paper is floated on the solution for a couple of minutes, then dried and exposed, and the prints developed by floating them on a solution of potassium ferrocyanide containing twenty grains of the salt in an ounce of water. Development completed, the prints are immersed in weak sulphuric acid (six drops to the ounce of water), and finally washed for ten minutes or so.

The "cyanotype" in this form is only, of course, a curiosity when employed with negatives, but it is a very valuable process indeed when the object is to reproduce engineers' drawings on tracing paper. Evidently in such a case the black lines will, if the paper is exposed under the drawing, be rendered as blue ones, whilst the ground through which the light has passed will remain white, the sensitive substance having been changed there from the ferric to the ferrous condition.

Ordinary note-paper is good enough for experimenting upon with these processes, but some of our readers might wish to secure blue prints possessing the brilliancy which characterises those made on sensitised silver paper. To do this, ordinary albumenised (*not sensitised*) paper is first washed in running water for half-an-hour to free it from the ammonium chloride with which it is impregnated, then dried, and treated with the sensitising solution, making use of a pledget of cotton wool to *brush* the solution on the surface, instead of floating the paper. And if a still greater amount of brilliancy be desired, the albumenised paper can be first of all floated on *boiling* water to coagulate the albumen, then washed and sensitised as before. Washing the paper in cold water removes the greater part of the albumen as well as the ammonium chloride, but this is avoided by coagulating it by heat.

The action of light upon ferric oxalate is the basis of the deservedly popular platinotype process, in which the image consists of metallic platinum, one of the most unalterable substances known.

The author gives information about the wet collodion process, and how to make lantern slides thereby by superposition. This may prove useful to some of the new race of photographers not versed in the processes of the past. The wet plate process is still somewhat extensively used by professional photographers for special purposes.

Art Photography.

Number 4 of the series, "Art Photography," is written by Mr. H. P. Robinson, and contains several engravings, all of which have been carefully printed. The work is readable, and is written in Mr. Robinson's usual analytical and interesting manner. On page 37 the author says :—

Although I have said I should prefer a beautiful untruth to an ugly fact, I cannot deny that more truth, within its limits, is expected of photography than of any other method of representation, and we must give all the truth we possibly can. If we cannot give the truth, the whole truth, and nothing but the truth, then we must lie like truth, which, after all, is perhaps as good a definition of art as we have.

The little book contains some practical instructions about combination printing, of which art Mr. Robinson stands undeniably at the head. As the whole system of combination printing has been vigorously attacked during the last year or two, the following utterances of Mr. Robinson in its defence may not be without interest:—

It was a maxim with the Spartans that if your sword was short you should add a step to it. It being, I think, sufficiently proved that our present optical resources do not enable us to represent properly some of the simplest scenes around us which we ought, as artists, to reasonably expect to be able to obtain, we must try some other way that will help us to succeed. The obvious step that we must add to our short sword, until something better is invented, is combination printing. I have now had more than thirty years' experience of this method, and still think it not only the best, but the only way of getting many subjects which should not be lost to our art. It is of all others the process for the amateur ; it will enable him to spend many pleasant hours, and haply achieve distinction. The method takes time and patience, no doubt, but you "get your own out of it."

Patent Intelligence.

8,913. W. S. Wardle, 290, Brixton Road, London, "Improvement in Photography."—May 27th.

8,210. H. R. Yea and F. J. Piper, 169, Union Street, Plymouth, "Camera Stands."—May 27th.

8,214. M. A. Wier, 3, Palace Grove, Upper Norwood, "Developing Photographic Films in Actinic Light."—May 27th.

8,372. H. R. Dines, 22, Garrick Street, London, "Changing Plates in Hand Cameras."—May 30th.

8,391. T. Hudson, 6, Lord Street, Liverpool, "Photographic Apparatus."—May 30th.

8,446. J. Pitt and W. Hudson, 128, Colmore Row, Birmingham, "Detective Cameras."—May 31st.

Specifications Published.

18,897. *December 10th*, 1890.—"The Manufacture of Photographic Films." A communication from George Eastman, of Rochester, in the County of Monroe, and State of New York, United States. Alfred Julius Boult, 323, High Holborn, London, M.I.M.E.

This invention relates to the manufacture of the improved flexible film produced in the manner and having the characteristics hereinafter described.

In practising this invention, a clear fluid solution of nitro-cellulose, or gun-cotton and camphor, is first made by dissolving said materials in one or more of the known liquid solvents, such, for example, as methyl-alcohol, which is preferably used because of its active solvent properties. To remove all unconverted or imperfectly dissolved substances from, and to clarify the solution, it is preferred to filter it through fine cotton cloth, the object being to obtain a solution which will be perfectly clear, and which can be readily spread in a thin layer or film upon the surface of a level glass plate or other rigid supporting surface, and which, when dry, will be photographically structureless. Such a fluid solution may be produced by dissolving 9,000 grains of soluble gun-cotton, or nitro-cellulose, and 5,400 grains of camphor in 112 ounces of methyl-alcohol.

It has been found that when such solution is spread out in the form of a film, and dried as the process of drying is accompanied with the evaporation of the more volatile constituents, the mass shrinks, and its exposed surface is liable to become pitted or covered more or less with small depressions, and that it is otherwise liable to prove objectionable. To obviate this it is preferable to add to the solution made according to the above formula, say 28 ounces of fusil oil, and also preferably, though not necessarily, 7 ounces of amyl-acetate, or any equivalent agent which produces the same effect.

The proportions above given for the solid and liquid constituents of the solution may be varied, as well as the proportions of fusil oil and amyl-acetate according to circumstances, but those which are above given have been found to give satisfactory results.

The dissolving of the solids may be hastened and the products rendered more uniform by the application of gentle heat with occasional agitation, the process being conducted in a

closed vessel to prevent loss by the evaporation of the volatile constituents.

Having made the clear liquid solution mentioned, the next proceeding is to obtain a thin layer or film of the same by depositing and spreading the solution upon a rigid supporting surface. For this purpose it is preferred to use a flat table or bed plate of plate-glass or other material having either a polished or dead surface, and on the surface of which the solution may be spread by means of a suitable spreader moving longitudinally over the said table.

It has, however, been found that when the fluid solution is applied directly to and dried on the clean surface of the table or bed-plate, it adheres so firmly to the said table that the subsequently formed complete photographic film can be removed only by the application of considerable force, which sometimes results in the tearing of it or in its being stretched unequally so that it will buckle, and be unfitted for use in roll holders and for negative making. To overcome this difficulty the surface of the glass or other rigid supporting surface, before the fluid solution is spread thereon, is rubbed over or coated with a weak solution of mineral wax in benzine, or other suitable solvent, or a weak solution of beeswax, or with any other equivalent agent to produce the same result. After the bed-plate or table has been so prepared, a thin layer of film of the fluid solution of nitro-cellulose and camphor in methyl-alcohol is spread evenly upon it.

The preliminary coating of wax solution should be of a character to weaken without preventing the adhesion to the glass surface of the supporting film, as it is very desirable that this supporting film, when dry, should adhere throughout its whole under surface to the rigid supporting surface until the photographic film is to be removed.

The next operation, which must be performed in a photographic dark room, is to apply to the surface of the supporting film a suitable sensitised medium such as fluid gelatino argentic emulsion in the form of a thin uniform layer or film, but experience has shown that unless special provision is made against such a contingency this sensitised film will not adhere at all points to the supporting film, but will be detached or separated at parts, and thus form blisters in the photographic film.

This, it has been ascertained, is due in part at least to the greasy character of the surface of the supporting film, to remove which such surface is washed preferably with clear water, to which has been added from 2 per cent. or 3 per cent. of a binding agent such as silicate of potash or silicate of soda. After the surface of the film support is again dry the layer or film of gelatino argentic emulsion is spread evenly upon the washed surface, and will be found to adhere uniformly The spreading of the sensitised film may be effected by the same apparatus as is used for spreading the supporting film.

The supporting film and sensitised film which, combined together, are herein termed the photographic film, are retained in place upon the rigid supporting surface until the sensitised film has dried, when the photographic film may, if desired, be cut into strips of suitable width, and it is then ready to be removed or stripped from the said rigid supporting surface, which may be effected by means of a traversing roller.

The film for supporting the sensitised film is necessarily made quite thin, ordinarily from 3 to 5 one-thousandths of an inch in thickness, or about the thickness of the paper supports heretofore generally employed in ordinary roll holders.

A photographic film produced as described, is of such thickness and flexibility that it can readily be wound upon the spools of ordinary roll holders, such as the Eastman-Walker roll holders, and manipulated for exposure in the latter. The supporting film or backing for the sensitised film is of a material unaffected by moisture, of uniform density, free from striae and buckles, and photographically structureless, and the photographic film as a whole is capable of being used for all those photographic purposes for which can be used glass plates with sensitised films in ordinary cameras or paper, with similar films in roll holding cameras.

Having now particularly described and ascertained the nature of this said invention, and in what manner the same is to be performed, as communicated to me by my foreign correspondent, I declare that what I claim is:—

1. The herein-before described improvement in the art of producing flexible photographic films, which consists in first applying a fluid solution of nitro-cellulose and camphor in a layer or film upon a rigid supporting surface, then drying the same, said film being photographically structureless when dry, and of sufficient strength and stiffness to properly support and sustain a suitable sensitised film through all the operations of negative making and printing positives therefrom; then spreading thereon, while still upon said rigid supporting surface, a thin layer or film of gelatino argentic emulsion; then drying the same while still on said rigid supporting surface; then stripping the photographic film from said support; such photographic film when dried and stripped being of such a thickness as to be flexible enough to be wound upon the rollers of, and used in, ordinary roll holders.

2. The herein-before described improvement in the art of producing flexible photographic films, the same consisting in depositing upon a rigid supporting surface a fluid solution of nitro-cellulose and camphor, spreading the same into a film of substantially uniform thickness, but having the surface in a flat plane, drying said film while still in contact with said rigid supporting surface, thereby producing its uniformity of surface and causing it to adhere closely to said rigid supporting surface, said supporting film being photographically structureless when dry; applying a thin layer or film of fluid gelatino argentic emulsion to the said dried and adherent supporting film by spreading said emulsion progressively from end to end of the previously dried supporting film, drying said film of emulsion while the supporting film is still adhering closely to the rigid supporting surface, and finally detaching or stripping the photographic film from the rigid supporting surface preparatory to winding the same upon spools; said photographic films being sufficiently flexible when dried to be wound upon the rollers of and used in ordinary roll holders, and to be manipulated in the latter for exposure.

3. The herein-before described improvement in the art of forming flexible photographic films, which consists in first making a fluid solution of nitro-cellulose and camphor; second, filtering such solution; third, depositing and spreading the same in a film upon a rigid supporting surface and allowing the volatile constituents to evaporate while the supporting film is adhering to the said rigid supporting surface, said supporting film being photographically structureless when dry; then applying an even layer or film of fluid sensitised emulsion to the surface of the supporting film, while still adhering to the rigid supporting surface, and finally drying said sensitised film and stripping the photographic film from its support.

4. The herein-before described improvement in the art of forming flexible photographic films, which consists in first making a fluid solution of nitro-cellulose and camphor; second, filtering such solution; third, depositing and spreading the same in a film upon a rigid supporting surface and allowing the volatile constituents to evaporate while the supporting film is adhering to the said rigid supporting surface, said supporting film being photographically structureless when dry; then applying an even layer or film or fluid of sensitised emulsion to the surface of the supporting film while still adhering to the rigid supporting surface, and finally drying said sensitised film and stripping the photographic film from its support by means of a traversing roller.

5. The herein-before described improvement in the art of forming flexible film supports, which consists in adding fusil oil to a fluid solution of nitro-cellulose and camphor, and subsequently depositing and spreading such solution upon a rigid supporting surface and drying it.

6. The herein-before described improvement in the art of forming flexible film supports, which consists in combining methyl-alcohol, camphor, nitro-cellulose, and fusil oil to form a fluid solution, and then depositing and spreading the latter upon a supporting surface and drying the same.

7. As an improvement in the art of producing flexible film supports, the herein-before described improved step in the process, which consists in forming the fluid solution, of a mixture

of methyl-alcohol, fusil oil, nitro-cellulose, and camphor, to form a fluid solution for spreading in a thin film upon a support.

8. As an improvement in the art of producing flexible film supports, the addition of amyl-acetate to a fluid solution of nitro-cellulose and camphor in a liquid solvent, and the subsequent depositing and spreading of said solution in a film upon a supporting surface and drying the film upon the latter.

9. As an improvement in the art of producing flexible film supports with smooth surfaces, the same consisting in combining fusil oil and amyl-acetate with nitro-cellulose, camphor, and and a fluid solvent, and subsequently spreading the fluid solution in a thin layer or film upon a supporting surface and drying the said film, preliminary to the application of a film of gelatino-argentic emulsion.

10. The herein-before described improvement in the art of forming flexible photographic films from a fluid solution of nitro-cellulose and camphor, the same consisting in first applying a solution of wax to the supporting surface; depositing and spreading the fluid solution in a thin layer or film upon said surface; drying the supporting film thus formed; spreading a thin layer of gelatino-argentic emulsion upon the dried supporting film and drying the same; and finally stripping the photographic film from the support upon which it was formed.

11. The herein-before described improvement in the art of forming flexible photographic films, which consists in applying an even layer or film of a fluid solution of nitro-cellulose and camphor to a flat surface by means of a spreader moving longitudinally of the same, evaporating the volatile constituents to dry said layer or film, and subsequently, while said film is adhering to the flat surface upon which it was first deposited, applying a fluid sensitised emulsion to its exposed surface by means of a travelling spreader, drying said sensitised film, and finally stripping the photographic film from the flat surface.

12. The herein-before described improvement in the art of forming flexible photographic films, the same consisting in first forming a layer or film of a solution of nitro-cellulose and camphor by spreading such solution upon the flat and rigid support, evaporating the volatile constituents to dry said film and cause the same to adhere firmly to said flat support, applying a film of sensitised emulsion upon the exposed surface of said film support and drying said film of emulsion, dividing the photographic film into strips while still attached to its flat support, and then winding said strips upon a roller or rollers to strip said photographic film from its support.

13. The herein-before described improvement in the art of forming flexible photographic films, the same consisting in depositing and spreading a fluid solution of nitro-cellulose and camphor upon a supporting surface in the form of a thin layer or film, and drying the same; then washing the face of the dried film support; then spreading upon the surface of said film support a film of fluid gelatino-argentic emulsion and drying the same; and finally stripping the photographic film from its support.

14. The herein-before described improvement in the art of forming flexible photographic films, the same consisting in depositing and spreading a fluid solution of nitro-cellulose and camphor in a thin layer or film upon a plate or surface previously coated with a solution of wax; drying said film support; washing the exposed surface of said film support; then spreading a thin layer or film of fluid gelatino-argentic emulsion upon said film support and drying the same; and finally stripping the photographic film from its support.

15. The manufacture of photographic films substantially as specified.

304. *January 7th*, 1890.—"Apparatus for Coating Photographic Plates." Frank Bishop, of the firm of Marion and Company, 22 and 23, Soho Square, London, Dealers in Photographic Materials, and Alexander Cowan, Chase Side, Southgate, London, Manager of Marion's Photo-Works, Southgate, London.

This invention relates to improved apparatus for coating photographic plates with sensitive emulsion.

The invention relates first, to the construction and mode of mounting of the coating trough, and has for its object to ensure the even distribution of the sensitive emulsion, and enable the thickness of the deposit to be easily regulated.

The trough is V-shaped in cross section, and is constructed of two strips or plates of glass, or other suitable material, the one, forming the inclined bottom side of the trough, being bedded upon a hot water circulation chamber, and the other, forming the upright side of the trough, being clamped in position with regard to the first-mentioned plate, its lower edge being truly ground at a suitable angle, and set at such a distance from the surface of the bottom plate as to regulate the escape of the emulsion, and allow it to flow in an even stream down the lower projecting part of the bottom plate. The ends of the trough are closed by blocks which assist to hold the two plates or strips in proper relative angular position. The hot water chamber extends the whole length of the trough, and to it are fixed at intervals clamps having set screws adapted to hold the plates forming the two sides of the trough in their proper relative position at all points of their length. The trough is supported by the ends of the hot water chamber being seated on balanced levers mounted to oscillate at the sides of the coating table, over which the trough extends, the lower edge of the inclined side of the trough resting lightly on the plates to be coated as they are carried beneath it upon the coating table.

In the case of a long trough, a lip formed by a strip of flexible material interposed between the bottom plate and the hot water chamber would be used to compensate for inequalities in the glass, and would rest upon the plates to be coated instead of the lower side of the trough itself.

The invention further relates to the means of supporting and guiding the plates whilst and after being coated, so as to avoid defects in the film due to local differences of temperature consequent on the contact with the under sides of the freshly-coated plates of their carrier-rollers or other supports. It also relates to means of receiving waste emulsion from the plates, so as to avoid the soiling of the under face of the plates with emulsion.

For this purpose, the plates are supported at their extreme edges only by knife-edged rails, and run between guiding rollers or pins mounted alongside the knife-edged rails, the edges of the plates overhanging gutters formed to receive superfluous emulsion, the guttered rails being arranged above a hot water tank, by which an even temperature is maintained.

5,046. *April 1st*, 1890.—"Photographic Camera." William Blake Luce, Boston, Suffolk, State of Massachusetts, United States of America, Draughtsman.

The inventor claims:—

1. The combination of a vertically elongated camera-box, having upright grooves and an aperture in the lower part of its front, and a lens-tube open at its inner end, and longitudinally movable in the said aperture, the said parts being so arranged that when the lens-tube is within the camera-box, sensitive plates placed in the grooves of the latter are supported by the lens-tube, and, as it is withdrawn, the plates drop one by one into the field of the lens carried by the lens-tube.

2. A camera-box having vertical grooves and apertured front, the said aperture being circular and internally threaded, in combination with a cylindrical, threaded lens-tube removable in the said aperture, substantially as set forth.

Royal Institution.—At the monthly meeting on June 2nd (Sir James Crichton Browne, M.D., LL.D., F.R.S., treasurer and vice-president, in the chair), Messrs. C. J. Cullingworth, M.D., F.R.C.P.; Jonathan Hutchinson, F.R.S., F.R.C.S.; Rudolph Messel, Ph.D., F.C.S.; Henry Charles Mylne; and Dan Rylands, were elected members.

Aluminium.—Every common brick contains two to three pounds of metallic aluminium. The raw material containing this capricious metal forms one of the chief constituents of the earth's crust, so that, next to oxygen and silicon, and perhaps calcium, aluminium may be considered the most abundant of the elements; yet the difficulties in the way of extraction are still so great as to call for a comparatively high selling price.—*Aluminium, its Uses and Alloys.*

Correspondence.

THE KIMBERLEY CAMERA CLUB.

SIR,—I am pleased to inform you that a Camera Club has been started out here. The following is a newspaper report dated May 10th :—

"A meeting of the principal amateur photographers in Kimberley was held last night at the Gresham Hotel, there being present Messrs. Macfarlane (in the chair), Trimble, Harrison, Chappell, Wallace, Ablett, Harden, Pringle, Skead, Moriarty, Titmas, Bousfield, Gassen, and the Rev. Ogle.

"The Chairman, in a few remarks, explained the object of the meeting, which was to form a club for the mutual improvement of members in photography. He had much pleasure in stating that eighteen members had already been enrolled.

"The following gentlemen were elected office-bearers :—*President*—Rev. Ogle ; *Vice-President*—Mr. M. Macfarlane ; *Hon. Secretary*—Mr. F. O. Wallace ; *Committee*—Messrs. F. Skead, T. Titmas, H. Moriarty, and J. T. Harrison.

"It was resolved that another meeting be held in a fortnight's time for the purpose of drawing up a set of rules ; a vote of thanks to the Chairman terminated the business."

F. O. WALLACE, HON. SECRETARY.

Kimberley, S. Africa, May 10th.

NEW OBERNETTER PAPER.

SIR,—I wish to call your attention to the new issue of Obernetter gelatino-chloride of silver paper for matt surface, exhibited at the Drapers' Hall in two prints. The toues obtained are beautiful and finer than platinotype or bromide, and though in black and white, preserve just that tint of half tones which is distiuctive of a photographic image. J. R. GOTZ.

19, *Buckingham Street, Strand, June 2nd*, 1890.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—AN APPEAL.

SIR,—Will you kindly afford me space to appeal to your readers on behalf of the P.B.A. ? At the annual meeting the fuuctions of the Association were so largely extended, by enabling the committee to deal with any well-authenticated cases of distress brought to their notice, that we are anticipating a considerable increase in the number of calls on our limited funds. In fact, the grants already made this year largely exceed the average. Under the new rules, contributions of former subscribers to the funds to the extent of £250 have been set aside as a nucleus around which to form an annuity fund, and this sum cannot be drawn upon for the purpose of grauting temporary relief. I wish to impress on your readers the fact that this is the only charity which exists with the object of assisting persons connected with photography who are in necessitous circumstances arising from misfortune ; and many who have been reduced to this necessity, including more than one name once distinguished in the profession, could testify with gratitude to welcome aid received from the P.B.A. in the time of need. The minimum subscription has been fixed at 2s. 6d., and I appeal to the benevolence of your readers to induce them, if I can, to subscribe to the funds according to their ability, with the confident assurance that the committee will deal with any money entrusted to them with discretiou and economy.

Subscriptions and donations will be thankfully acknowledged, and a copy of the rules forwarded, by the honorary secretary, Mr. H. J. Beasley, 65 aud 66, Chancery Lane, W.C.

Thanking you for your kind support in the past,

WILLIAM BEDFORD, *Chairman of Committee.*

EAST DULWICH PHOTOGRAPHIC SOCIETY.—The following are tho excursions proposed for the dates named :—June 21, Windsor ; July 19, Boxmoor, Hemel Hempstead, and neighbourhood ; August 4, Arundel ; August 16, Burnham Beeches ; September 20, Chingford and Epping Forest. The place and time of assembly are to be arrauged on the night immediately preceding the excursion.

Proceedings of Societies.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 29th ult., Mr. T. E. FRESHWATER occupied the chair.

Mr. C. H. COOKE passed round three plates he had exposed on some flowers. No. 1 had been dipped in a bath of erythrosin and ammonia ; No. 2 in erythrosin without ammonia ; No. 3 was an ordinary plate. A yellow screen had been used in all cases. No. 2 gave the best results. The strength of the erythrosin solution was 1 in 35,000.

Mr. P. EVERETT asked the particulars as to Tailfer's patent, and Mr. W. E. Debenham explained them as far as his memory permitted.

Mr. J. S. TEAPE passed round some prints on the iridium paper distributed at the previous meeting ; he corroborated the statement made on that occasion, viz., that the printing was very rapid, but the loss in toning and fixing was very great. In answer to a question, he said that he used the toning bath as soon as made, and it was considered that had he used an old toning bath the reduction would not have been so great.

Mr. DEBENHAM said that many years ago Messrs. Hennah and Kent, of Brighton, produced a number of pictures on plain paper which were much admired. When Mr. Hennah published his formula it was found that he used a small quantity of chloride of gold in the salting solution.

Question—"In using a pinhole camera, how is the distance between the hole and sensitive plate determined ?"

The questioner was referred to the tables published in the Journal, giving the size of hole and distance by which best results had been obtained. The image is in focus at different distances from the piuhole.

Mr. A. COWAN said if the pinhole were a suitable size, all that had to be determined was the size of picture, roughly speaking. If a 6-inch focus lens would give the object the size required, the plate should be placed about that distance from the pinhole.

The Saturday outing for June 14th is to Epping Forest. Members to meet at Hale End Station (G.E.R.) from 3 to 3.30.

THE LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 29th May at 3, Lord Street, Mr. PAUL LANGE presided.

The following were elected members of the Association : Messrs. R. Rawlinson, F. Hope Jones, Edgar Storey, R. L. Rawlins, H. Bebbington, and James Nelson, jun.

Mr. WILLIAM TOMKINSON reported on the excursion to Burton on 3rd May, when about forty members took part in photographing this picturesque Cheshire village, and 163 pictures were taken.

Mr. J. MACDONALD BELL exhibited a patent plate rocker, wound up and set going with a clock-work arrangement.

The PRESIDENT announced that the next excursion would be to Rossett and Cresford on Saturday, the 7th June ; and that the next practical demonstration would take place on the 11th June, the subject to be "The Intensification aud Reduction of Negatives ;" demonstrator, Mr. T. L. Mackrell. After this the series will be discontiuued until September, when it will recommence with "Lantern Slide Making."

The Eastman Company (representative Mr. H. M. SMITH), then exhibited and explained the Kodak No. 4, 5 by 4 camera, and promised to come to the next meeting on June 19th, and give a practical demonstration with the films.

The evening concluded with the exhibition of the Boston (U.S.A.) new set, entitled "The White Mountains of New Hampshire," prepared by members of the Boston Camera Club, and lent to the Liverpool Association in trust, for exhibition to any photographic society in the United Kingdom on application to Mr. E. M. Tunstall, hon. sec. of the Liverpool Association.

Mr. PAUL LANGE read the descriptive lecture which accompanies this set, mounted in type on large cards, with the photo-

graph of each slide on the back, so that the lecturer is able to keep a check on the lanternist by referring to the back of his card. The slides were shown by the aid of Messrs. Archer's oxyhydrogen lime-light lantern. It may be interesting to notice that our American friends have had their slides made by the wet collodion process, and this set is considered far superior to the former one on "Boston."

The Bath Photographic Society.

May 28th.—Mr. George F. Powell in the chair.

Delegates were appointed to represent the Society at Chester. Dr. Preston King, Messrs. E. J. Appleby, and G. J. Turvey, were elected members.

Watkins' exposure meter, sent for exhibition, was shown.

Mr. C. Cloakley exhibited a new tripod stand, constructed with double parts at the bottom; also an instantaneous drop shutter, rigged on a shifting platform, by which means the shutter is pushed aside when desired for focussing or other purposes. The points referred to he claims as new.

Mr P. Braham, F.C.S., F.R.M.S., then delivered an address on the subject of "Photo-Micrography," which he fully illustrated. Mr. Braham commenced by saying photography is a powerful aid to science and truth, and in each branch of investigation its uses are increasing, and also arts and manufactures are benefitted by it. What its future developments may be, it is hardly competent for human intellect more than dimly to surmise. In astronomical investigation it has already done great service, and objects unseen by the human eye have been developed by the sensitive film and, assisted by spectroscopy, given information concerning systems hitherto unknown. In microscopic investigations, permanent and truthful records can be retained of transitory subjects, and successive periods in formation and development printed on the film for future reference. The small bijou lime light was shown to be, next to sunlight, the best for producing sharp images, as the rays emanate from a spot of light, while with other lights a portion of a sheet of flame is used, and cannot give a perfect image. The diminutive lime light is fitted on a condenser stand, or on the microscope in place of the mirror, and has an adjustable lens in front consisting of a microscopic objective, a convergent, divergent, or parallel beam being alone used with no eye-piece, as every additional lens interferes with the accuracy of the image. If different objectives are used, with sufficient distance between them and the sensitive plate, photographs of any required size can be taken. There may be a slight adjustment required from the visually perfect image to the photographic; this can only be accurately ascertained by experiment, as this distance varies with different objectives.

Photographs were taken of a microscopic photograph to graphically illustrate the difference between photo-micrography and micro-photography, and also of an opaque object, which were very successful. With regard to objectives generally, the lecturer said that in the telescope the effective or useful area should be clearly specified, and the angular aperture or effective area in microscopic objectives, and in photographic lenses the largest stop with which a sharp picture can be obtained should be known.

A discussion followed, in which Messrs. Wheatcroft, Wells, Bristow, Williams, C. G. R. Wood, Cloakley, Dr. King, and the Chairman took part. Several questions were put and replied to, and a hearty vote of thanks was accorded to the lecturer.

Mr. J. A. Rudge exhibited in action the machine which he has invented, and named "The Bi-Phantascope." The object of the inventor is to take photographs which can, by the same lens, be reproduced with sufficient exactitude to represent animation. Thus, facial expressions, under any circumstances, may be shown by means of transparencies from suitable negatives, with all the muscular action noticeable in life, and free from jerkiness attendent upon the "wheel of life" method adopted by Muybridge and others.

The Chairman showed a series of pictures made by means of the No. 2 Kodak, charged with a band of sensitive celluloid. Some of the prints were among the best that have been seen of this class of work.

Mr. E. E. Peacock handed round samples of combination printing of a creditable character.

Two fine studies of cloudland, reproduced on bromide opal, 24 by 18, were sent for exhibition by Mr. Friese Greene.

The Photographic Society of Philadelphia.

A meeting was held on May 7th, president John G. Bullock in the chair.

The committee appointed to prepare a memorial of the late president of the Society, Mr. Frederick Graff, presented their report, from which we extract the following:—"Perhaps one of the greatest sources of consolation to those who are called upon to mourn the loss of a friend and leader, is the review of his past life as connected with themselves and the interests over which he presided, particularly when those recollections fill us with love, admiration, and respect for the character of our lost friend; we think this will be found pre-eminently the case in regard to our late lamented president, Frederick Graff. We have been accustomed to see him in our midst so ong a time, presiding over our councils, encouraging us by his example and advice, exciting our zeal in the race by his own untiring interest in our work, and his great desire that our noble art should be more than a casual amusement for the passing hour. His own love for it was genuine—amongst the very first to take it up as an amateur, and to apply to it all the energy and resources of his well-trained mind, his interest never flagged, nor did his enthusiasm diminish during his life. The social side of his character was not less remarkable. He was always ready to assist with his advice and counsel those standing in need."

Mr. Frederick E. Ives sent to the meeting a package of photo-micrographs. In a note accompanying the prints he stated that they were made with comparatively low-priced objectives, which were not intended for photographic work, and not selected with a view to such use. Some of the plates used were Carbutt "orthochromatic," others Seed plates treated with erythrosine, and all exposed through yellow colour-screens. A small pencil of light was used for amplifications up to forty times, a bull's-eye condenser for medium powers, and condenser of seventy degrees for high powers.

Mr. Cheney, referring to the matter of incrustations on cover glasses of lantern-slides, stated that having had occasion to remount two old silver prints which had been framed for many years, he found the same incrusation on the glass which had covered the pictures. In this case the cause could not be looked for in any chemicals emanating from the glass plate. He attributed the incrustation in some way to acetic acid.

Mr. Stirling read a letter from Mr. York, the English slide-maker, stating that the incrustation was due to the use of French or German glass, which contains an excess of alkali which is acted upon by moisture. With English flatted crown glass the trouble could not occur.

Mr. Coates, who had a large collection of slides made by Mr. York, stated that he had never found the defect on any of these slides.

Mr. Fellows stated that he had experienced the trouble with English flatted crown, as well as with the French glass.

Mr. Sartain had frequently seen the deposit on the inner side of the cover glass of Daguerreotypes. In this case it was thought that the chemicals used in forming the picture caused the deposit on the glass.

Mr. Stirling, referring to the recent Photographic Exhibition at Newcastle-on-Tyne, thought the Society had reason to congratulate itself very much on the achievements of three of its members, no less than four medals having been won by them. Mr. Pancoast won a silver medal for architectual subjects, Mr. Bullock a bronze medal for landscape work, and Mr. Redfield a silver medal for figure subjects, and also one for lantern slides. The best English professional and amateur workers met on equal ground in these competitions, making the result all the more gratifying.

Mr. Francis Burrows showed a French hand-camera, in the form of a pistol. It contained a roll of Kodak films, making a square picture the full width of the film. The exposure

was made by pulliug a trigger, as with an ordiuary pistol. About one hundred exposures had been made, but, owing to some fault in in the shutter, which was rather heavy, it had not quite produced a sharp negative, the shutter invariably jarriug the camera at the instant of exposure. A register showed the number of exposures made, and two short legs could be turned down in front, forming with the pistol butt a tripod stand for use with time exposures.

Mr. EARLE showed a camera made by R. and J. Beck, the mountings of which, as well as the lens, were of aluminiuun. The reduction in weight as compared with brass, as usually used, was about one half. A rack and pinion movement operated the back portion of the camera in focussing, enabling a short focus lens to be used as readily as one of long focus. The front board could be extended by hand to any desired point, within moderate limits.

Mr. WALMSLEY showed a camera he had devised for microscopic work. The box was but about four inches square, mounted on an adjustable rim stand, with bellows for attaching to the microscope in any position. Authony's Lilliput plate-holders were used, carryiug either plates or films. He had used powers rangiug one and one-half to one-fifteenth with equally good results.

Mr. REDFIELD showed a tripod stand made by Ashford, of Birmingham, England. It was made of teak wood, and so constructed as to be very strong and rigid, and at the same time quite light. The lower leg, by a convenient arrangement, could be drawn up between two of the four upper pieces entirely to the top, shortening the legs one-half, and making the adjustment for uneven ground or to various heights very convenient.

Mr. HANAWELT showed an exposing-shutter of his own invention, in which the slide moved horizontally in front of the lens. The opening being narrower at the top than at bottom, gave one-half the exposure to the sky as compared with the foreground. By an ingenious mechanism, a sort of crauk motion operated the slide, avoiding any jar at opening and closing, aud regulating the movement of the slide so that its speed was slowest at the instant of full opening, and quickest at the begiuning and close of its action.

Mr. J. E. DAWSON writes that the story quoted in our last from a daily paper, about Mr. Gladstoue and the Photographer, is not quite accurate, and encloses us an iuteresting extract from the *Huddersfield Examiner*, for which there is not space this week.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The last meeting of the session will be held at 5A, Pall Mall East, ou Tuesday, June 10th, at 8 p.m., when papers will be read on "The Estimation of the Efficacy of Plate Backing," by W. E. Debenham; on "The Staining and Clearing of Gelatine Films," by Chapman Jones, F.I.C., F.C.S.; and on "Photographing the Induction Spark," by Sir H. Trueman Wood, M.A.

HE KNEW HIS BOY.—Father (to Photo Artist): "I would like you to give my son a chance in your studio." Photo Artist: "What can the lad do?" Father: "Well, at first he couldn't do anything more than take charge of all the operating, retouching, and printing departments; but later on, when he has more experience, he will be right handy to do the sweeping, clean the windows, and sift the ashes."

CAMERA CLUB NOTICES.—Thursday, Juue 12th, 8 p.m.—Informal Meeting. Friday to Monday or Tuesday, June 13th to 16th or 17th.—Excursion to Norwich and the Norfolk Broads; Leader, Dr. D. G. Thompson. Meunbers intending to join are requested to notify same, and the time they will remain of the party. See notice of particulars in Club, or write for same. Thursday, June 19th, 8 p.m.—Informal Meeting. Thursday, June 26th, 8 p.m.—Informal Meeting. Saturday, June 28th.—Excursion on River Thames, from Reading downward. Ladies invited. Leaders, Mr. W. Clarke and Mr. J. F. Collins. Full particulars will be sent to those desiring them.

H.—The ladder by which you are ascending to the Temple of Fame, candidly we do not think to be poetry.

M.—The less said about the matter the better.

Owing to the pressure on our space, articles by Dr. Morton, Hermann Gunther, and others in type, are held over till our next.

Answers to Correspondents.

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

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

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

W. M. (Clapham).—*Oiled and Crumpled Paper Negatives.* The best way would be to remove the oil or vaseline first by repeated treatment with fresh benzol, theu dry, and iron the negatives between leaves of blotting paper. This will make them clean and flat again, and then perhaps you can intensify; but great care must be taken first to remove every trace of fatty matter. This done, grease them again with vaseline oil on the wrong side, bake them well in the sun until all opaque spots have disappeared, aud finally remove the superfiuous grease with cotton wool.

M. P. S.—*A New Method of Determining the Sensitiveness of Photographic Plates.* The research to which we briefly referred last week should have been attributed to Dr. F. Hurter and Mr. V. C. Driffield coujointly, iustead of being put down as the work of the first-named gentleman alone.

COL. WATERHOUSE.—*Guaiacol as a Developer.* Your paper was received in time to be printed in the May *Photographic Journal*. All other particulars were given in our private letter of the 28th ult.

W. H. S.—*Judges, 1890 Exhibition.* Your views have to a considerable extent been endorsed by the writer of the leading article in last week's NEWS. Although several painters have been nominated to serve ou the jury, it is hardly likely that more than two or three will be elected, and these would strengthen the body of judges on the art side, so that great benefit may be expected from their association with the photographers as in former years. Your second remark is answered by the official notification that the ballot was not to close until June 4th, thus giviug ample time for the voting papers to be returned.

A. G. (Brighton) — *The City Exhibition at Drapers' Hall* is well worth a visit, and remains open a week longer. In addition to the framed specimens and isochromatic work, there is a goodly show of apparatus, including the Moessard cylindrograph camera.

E. P. (Bangor)—*Strength of Acetic Acid.* The hydrometer furnishes no reliable indication, for the specific gravities are altogether anomalous. You may test with standard alkali (dilute caustic soda) added until litmus paper shows it to be exactly neutralised. For the glacial acid, a very good proof is to boil it in a test tube, and see whether the vapour is inflammable.

A. M. M.—We thank you for your kind offices in the Indian matter.

L. E. D.—*Stereoscopic Photography.* Of late there is quite a revival in this branch of our art-science, several English and many foreign amateurs having been working with twin lenses during the last and present seasons. The Belgian *Bulletin* has an article on the subject, and the last technical meeting of the Photographic Society was devoted to it. Although Wheatstone announced the instrument in 1838, it was not until photography had come to his aid by furnishing satisfactory diagrams, and Brewster had popularised the matter by the invention of the lenticular stereoscope, that much progress was made; then Wheatstone gave his Bakerian lecture on January 15th, 1852, to put the finishing touch to this important branch of scientific work. The earlier attempts failed by reason of employing too wide an angle.

J. W. W. (Burnley).—*Brown Stains on Dry Plate Negatives.* The plates seem to have been kept too long; try the effect of prolonged immersion in a clearing bath of citric acid and alum. See YEAR-BOOK, p. 197; or, for fresh trial, use Bedford's developer, p. 195.

W. V. MORRIS, H. F., J. M., and A. T., received.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1658.—*June* 13, 1890.

CONTENTS.

PHOTOGRAPHY IN NATURAL COLOURS.

Much stress has been laid by Dr. Eder and Dr. Vogel about the amount of permanency of the photographs in natural colours sent to them by Herr Veress, unaccompanied by a description of his process. As yet, there is no published evidence of any advance having been made by Herr Veress over those who have preceded him in the work, and the testimony as to the durability of the results may be founded upon incomplete information as to what has been done previously in this matter. The photographs in natural colours, in their earliest days, faded rapidly, but after a time it was found that they could be to some extent fixed by a weak solution of ammonia of carefully regulated strength; little or nothing is on public record as to the time of immersion in this bath. The fixing at last arrived at such a degree of perfection that Mr. Traill Taylor, who had some of these photographs sent to him for delivery to Sir David Brewster, found that they were not visibly affected by two weeks' exposure to daylight. To the day of his death Mr. Warren De La Rue had one of Becquerel's partially fixed silver-plate photographs in natural colours in his possession. We first saw it about twenty years ago at his private observatory at Cranford, where he photographed the moon, and again quite recently, but a few months before his death. In the twenty years it was practically unchanged, so far as memory can be trusted, but it must be remembered that when it was not required for inspection Mr. De La Rue kept it carefully protected from light in a leather case.

Some of the early photographs of this class being thus permanent, what becomes of the only testimony adduced that Herr Veress has made a new departure? He candidly says that "too much bustle" has been made about his experiments, a remark which is amply justified so far as any information at present before the public is concerned. Dr. Vogel has found that twenty minutes' exposure at four o'clock in the afternoon to slightly veiled sunlight, or seven minutes' exposure to an unspecified kind of electric light at a distance of fifteen centimetres, deepens the ground tint of the photographs sent to him by Herr Veress.

In all photographs of this class hitherto produced, those on paper have not been so pronounced or so pleasing as those upon glass, partly, perhaps, because the ground colour seems to show up more strongly upon paper.

The latest information upon photography in natural colours relates to pictures on paper, and is published in the number of *Le Moniteur de la Photographie* just to hand. The *Moniteur* sets forth that at the last meeting of the General Photographic Syndicate in Paris, M. E. Vallot exhibited a good photograph in natural colours, printed directly from a coloured picture upon glass, and it was produced in this way:—

Thick photographic paper is floated for three minutes upon—

Water	100 grammes
Chloride of sodium	20 ,,

It is essential that the paper shall then be dried quickly.

Next it is sensitised for five minutes upon the following bath:—

Water	100 grammes
Silver nitrate	10 ,,

After draining for a few moments, it is washed in running water for ten minutes.

Then, to get rid of all traces of nitrate of silver, it is placed for five minutes in—

Water	100 grammes
Sodium chloride	20 ,,

It is then washed for several instants.

The violet argentic chloride of silver is then formed by exposing the paper to light in a bath containing five hundred centigrammes of water to which twenty centigrammes of the following solution have been added:—

Distilled water	100 grammes
Protochloride of tin	3 ,,
Sulphuric acid...	10 drops

When the film has taken a deep violet colour, it is washed for five minutes and allowed to dry.

When dry, it is washed for two minutes in a mixture of equal parts of the two solutions given below :—

Solution A.

Water	...	...	...	100 grammes
Bichromate of potash	...	...	5	,,

Solution B.

Saturated solution of copper sulphate.

After being dried, the paper is in a condition suitable to give colours. Under a coloured painting on glass, an exposure to full sunlight for three-quarters of an hour is necessary.

When removed from the printing frame the colours are seen on the paper, but as if fogged, but come out more brilliantly after the print is put in the following bath :—

Water	...	...	...	100 grammes
Sulphuric acid	...	...	20	,,

The prints must not be left too long in this bath, because it at first improves, and afterwards destroys the colours.

After abundantly washing these prints, M. Vallot albumenises them to give *eclât* to the different tones. The *Moniteur* says nothing about any fixing operation.

Full information as to the production upon silver plates of photographs in natural colours will be found in the last PHOTOGRAPHIC NEWS YEAR-BOOK, and to bring information on helioehromy down to the latest date, we now quote a letter from the *American Journal of Photography* just to hand, which letter is written by Herr Veress himself, who therein also does a valiant battle royal with the English language, in which the language has come off the victor :—

DEAR SIR,—Please accept my thanks, dear sir, for your kindness as to continue sending your journal to me, although you knew that my journal, the *Fenykepészeti Lapok*, had ceased to appear. I assure you, it has been always an enjoyment for me to receive your paper, so excellently edited, and I would truly be very glad if the little sortiment of my photos upon paper and glass in natural colours, I send you by the same mail, would prove you how much I esteem the favour you do me. Please, dear sir, to select some of the photos, and deliver it, as well as the enclosure, to Mr. Carey Lee, his lodging being unknown to me. I shall be very thankful to you, because I want to say him myself, how much I value his arduous labours. He goes quite another way than I do, but if he be ready to unite his experience with mine, I am persuaded we would triumph in a very short time. You see, dear sir, that I succeeded to fix the colours ; its for the preparation upon glass, it is in gelatine, upon paper in collodion. The exposure of the photos upon glass was of 3-5 hours, upon paper 2-3 days. Since I succeeded to make such photos upon smooth plates of thickened (condensed) petroleum in 10-30 minutes.

The plate is put into a copying-frame, and exposed from a transparent coloured drawing. My aim is now to lessen the time of exposure as much as to enable me to work with the camera, to photograph moving objects, which I could not do till now, because for camera work I wanted 2-3 weeks.

FRANCIS DE VERESS.

Kolozsvar (Klausenburg), Hungary.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Monthly outing, June 14th. Members to meet at Wood Street Station (G.E.R.), at 2.40, and walk through Cook's Folly to Hale End. Trains from Liverpool Street 2.2 and 2.16.

ABOUT SOME DEVELOPERS.

EVERY photographer has his pet method of development, and, as a natural consequence, he is apt to decry everything but his own particular formula. This is as it should be, for a man is far more likely to do good work if he believes in his tools to such an extent that he does not care to meddle with new fangled ones. We have known certain amateur photographers who have never yet succeeded in turning out any good work, simply and solely because they have had a superabundance of time and money on their hands, which have led them into temptation. We all know that a certain large employer of labour is, according to Dr. Watts, always ready to find "some mischief still for idle hands to do," and the particular mischief that commends itself to the idle man of photographic proclivities is to mess about with all the different brands of plates and with the various developers which are placed from time to time within his reach by enterprising traders. Such a worker, at the end of a few weeks, finds his dishes, his measures, and his bottles in a state of topsy-turvydom, which is only equalled by the chaos which exists in his own brain.

A beginner is always to some extent puzzled as to the right developer to use, and if he can only get hold of something in a bottle which will coax out some kind of an image when thrown upon an exposed plate, he is satisfied. The bottle must contain a ready-mixed liquid, and so long as it will act, the aspirant to photographic fame is happy, and will ask no questions about its composition. It, of course, stands to reason that such a worker will never become an expert, although he may, by an occasioual fluke, turn out a good picture ; but still he will be better off by sticking to his bottle of unknown liquid than he will be if he is always ringing the changes upon every nostrum that is brought forward.

Within the last few years several new developers have been introduced to the notice of photographers, and each has its admirers. Some will declare that hydrokinone gives them far more certain results than anything else which they have ever tried. Others give the premier place to eikonogen, and it is certain, as one of our notes stated the other day, that several photographers are taking to it for ordinary studio work. A new developer, bi-kinol, has only just been introduced into the market by Mr. Hinton, and this, too, has already many friends. Then we have a number of old-fashioned workers who say that the pyro and ammonia "mixture as before" is as good a medicine for their complaints as they can find, and that they intend to stick to it through thick and thin.

Now it is our duty to look upon all things photographic with a strictly impartial eye, and to do our best to point out as far as we can the excellencies or shortcomings of anything in the shape of apparatus or formulæ which come under our notice. Nor are we in the habit of passing an opinion upon anything until we have submitted it to trial. With a view to ascertain

the relative merits of some of the developers now in use, we put them to a practical test in the following manner: First of all, we exposed a 10 by 8 plate in the camera, giving it sufficient time to fairly bring out —as we judged—all possible detail. We, in fact, did our best to produce a good negative by means of normal exposure, and without relying upon any kind of forcing during development. When this plate was duly exposed, it was removed to the dark room and divided with a diamond into four equal portions. We marked these on the film side with an aniline ink pencil respectively, "bi-quinol," "hydrokinone," "eikonogen," and "pyro." We then proceeded to develop each with the developing agent whose name it bore.

The first to be treated was marked "bi-kinol," a developer which is supplied in two solutions. We mixed these in the proportions recommended for a normal exposure—*i.e.*, forty minims of each to the ounce of water. Watch in hand, we looked for the first trace of the image, and noted its appearance in one minute and a-half. We judged development to be complete in four and three-quarter minutes. Result, greatly under-exposed. Next came the hydrokinone, which brought out an image in two and three-quarter minutes, but which at the end of seven minutes appeared far more under-exposed than its predecessor. Evidently, we thought, we had made a mistake, and should have kept the cap off the lens for another half second or so. But we proceeded with our work, and took up the "eikonogen" plate. In this case the sky portion appeared in one minute, and detail followed in two minutes, all action stopping at the end of six minutes. This plate had far more density than the other two, but still we should have preferred to see a far denser result. We now had only one plate left for treatment, and for its development we were to rely upon pyro and ammonia.

This old-fashioned developer we mixed in the proportions which experience has proved to be the best for bringing out the image on a plate which has received the normal exposure. Again we timed the operation, and we noted that the image made its appearance in twenty-five seconds, the action being complete in two and a-half minutes. There was every indication that the exposure had been quite sufficient, as will be seen by the time required for development to become complete. No further addition of the alkali was needed, and we may mention that the developer was restrained at the outset with bromide, and that the pyro used had been mixed for some weeks previously with a preservative in the shape of potash meta-bisulphite.

The four portions of the negative were duly placed in the fixing bath, so that they could be examined in a completed form. But the results already noted during development were in no case modified. The pyro developed portion was the only one which would be capable of yielding a satisfactory print. It was dense in the high-lights, exhibited clouds in the sky portion, and was generally crisp and brilliant. The others all suffered, more or less, as we have said, from under-exposure.

Our experiment tends to show that the old pyro and ammonia developer is not yet displaced by any newer agent. At the same time we may point out that in the latter the amateur has something to fall back upon when he finds that his negatives are over-exposed. It is a common fault into which the amateur falls, and he subsequently finds that pyro development gives nought but thin images, which are useless to him. Let him seek the new agents for a remedy, and hold fast to that one which he finds to be good. For transparency work, where exposure often extends over half a minute or more, some of these new developers are far better than pyro; and we shall take an early opportunity of detailing some experiments we have made in this direction.

REDUCING HALATION.

LAST Tuesday night Mr. Debenham read a useful paper before the Photographic Society about halation. On looking down upon a piece of plane glass at a bright spot of light reflected therefrom, the interior reflections between the two surfaces and some other conditions, render it difficult to see how much of the light comes from the back and how much from the front surface, also how much is absorbed by any particular "backing." Mr. Debenham's plan was to paint various backings for reducing halation side by side upon one surface of a prism, by which method the conditions of observation became much easier. Bitumen has long been known to form a good backing for plates, but it is troublesome to remove, and Mr. Debenham described experiments by which he had found that a solution of caramel in gum water acts even better than bitumen. The least troublesome method of backing a plate, in our experience—and the plan is but moderately efficient—is that which we devised in 1881, and published in current photographic literature; namely, rubbing glycerine over black mackintosh in a thin film, then squeegeeing the fabric upon the back of the plate. This backing can be pulled off just before developing. Perhaps the substitution of a solution of caramel in glycerine will increase the efficiency of the latter mode of working, and give little trouble to the operator.

Why does not some enterprising manufacturer introduce backed plates into the market, wrapped in pairs, so that, if opened by custom-house officers, only two plates are likely to be spoiled and fogged, instead of all in the box? Why, again, are not printed labels in four or five European languages pasted outside the boxes, stating their contents, and that they must not be opened in ordinary light? Why, again, are not the developing formulæ recommended by the particular maker not always pasted on the outside of his boxes, so that the solutions can be made up before opening a box of plates? One or two makers have already adopted the latter plan. An extra charge must, of course, be made for all these conveniences combined.

INK FOR WRITING ON PHOTOGRAPHS is made of iodide of potassium, 10 parts; water, 30 parts; iodine, 1 part; and gum arabic, 1 part. It produces white lines on the dark background.

PHOTOGRAPHIC EXHIBITIONS.

BY GEORGE DAVISON.

II.

IT is matter of common notoriety that photography in England did not long maintain the high and dignified standing which it took at the outset. No wonder, then, that photographic exhibitions should also soon lose some of the simplicity and dignity which characterised them whilst they were solely the outcome of pure, scientific enthusiasm. In the facility of producing representations of a kind, in the rapid extension of photography as a popular pastime, and the development of dependent industries, there seems to have been generated the seeds of disease or weakness, which naturally showed itself somewhat in exhibitions. Taking the state of things at the end of the first decade of such enterprises, we find medals and prizes, classification and unnecessary limitations, introduced. At the tenth exhibition of the Photographic Society of London, held in May, 1864, at the galleries of the Society of Female Artists, in Pall Mall, five medals were offered, with the impossible and odious "besting" system. One was for the "best" portrait, another for the "best" landscape, a third for what was called a "group," a fourth for architectural work, and a fifth for photo-mechanical processes. With, probably, the aim of barring some individual or individuals more mechanically skilful or painstaking than the rest, "groups" were only permitted from *single* negatives. Possibly this restriction was devised to discourage what might have been held to be the reprehensible practice of combination printing, but it hardly seems so. Amongst other conditions, there was the sweeping order that no pictures from painted or touched negatives would be permitted, a duplicate to accompany each picture. Three inches margin was allowed for large pictures, two for smaller, an unhappy recommendation to put several small photographs in one frame being appended

The character of subsequent exhibitions was not dissimilar, simplifications and improvements being introduced from time to time as far as the Photographic Society's exhibition was concerned. Coming to the present time, the leading features of the general run of exhibitions are too well known to require much description. A laudable desire to please and attract everybody, and make a financial success of the undertaking, minute classification and subclassification, piles of metal medals, consolation stakes, even handicaps, and all in such profusion that the only question with each exhibitor is, whether he will obtain a first, second, third, fourth, or extra prize—these seem to be the characteristics that circumstances have brought us to. It has been the rapid increase in such puerilities and excesses that has at last stirred up so large a section of those interested in photography to take some active steps in the matter. The special meeting of representatives at the Camera Club early in 1888 was the first sign of any combined action, and the influence of those discussions and resolutions was seen in a gradual education of the great body of exhibitors themselves, and in the increased interest shown by the press in the subject. The more definite pronouncement made at the Camera Club Conference this year may be taken as the expression of the opinions and views which, in the course of the year past, have become rife amongst photographers. The adoption of most of those conditions, and a closer following of the regulations in force at the Photographic Society's exhibition, are now fairly well ensured. The complete change will not be immediate, as is seen in the mixture of reformed rules and deference to local prejudice displayed in some of the announcements for future provincial exhibitions. However, the improvement, though gradual, is certain, and has its greatest encouragement in the proof it adduces that a higher estimation is held of the scope and value of photography.

Turning to the inception of the movement which has developed into the recent rage for reform, it is found that, as far as any individual influence can be distinctly traced, Dr. Emerson is responsible for first laying down the lines upon which the agitation has travelled, just as, guided by a severe culture, he has been the first to introduce into photography, by example and precept, much else that is valuable and likely to bear good fruit. In October, 1885, he published in the *Amateur Photographer* an article giving an outline of an "Ideal Exhibition," and it is interesting to notice how exactly the later outcry has, unknowingly, taken its watchwords from those suggestions. They are the conditions which any individual, moving under the influence of the most cultivated art of modern times, would be compelled to impose, and there is hardly more than one of the suggestions in that article which anyone could wish to alter.

The chief of these proposals were:—1. That all the judges be artists (certain names of those capable of understanding the true scope of photographic art being given). 2. One picture, one frame. 3. No retouching. 4. Uniform framing (say all gilt.) 5. That the judges be the hanging committee. 6. That there be no classes, but that the award be made for the so many best pictures. 7. Each exhibitor limited to three pictures. Such exhibitions, Dr. Emerson added, he was sure, "would do more to raise our art than the most voluminous writings." In proposal No. 7 I take it the suggestion conveyed is that nothing inferior should be received, a most important regulation for every public exhibition, and one more often adopted in earlier days than now, but chiefly then on account of limited space. One of the earliest announcements to this effect was in connection with an exhibition of the French Photographic Society in 1861, where it is stated in the *British Journal*, February 15th, 1861, a jury was appointed "to weed out" the photographs.

Now it is evident that a code of rules such as that just indicated is framed for an art exhibition purely, and it is in that connection that most of my remarks are made. A magnificent photographic exhibition, exclusively historical and scientific, might, with energetic management, be organized, but certainly any system of competition and awards would be equally out of place in such an enterprise. Even in a trade exhibition, the objectionable results of prizes and medals are now generally held to be greater than any advantages derived from such competition and lottery.

Taking photographic exhibitions as we find them, the tendency is ever towards making them art exhibitions, and, therefore, the whole question of regulations turns upon the art capabilities of photography. If there are no possibilities; if photography is to be held as a lame, limited, and mechanical means of æsthetic representation, without any power of artistic expression, as held by Mr. Stillman and one or two half-hearted supporters of his views in this country, then most of this agitation is misdirected, and it matters little whether the dignity and influence of photography be consulted in these shows, or whether they be promoted and regulated merely as a use-

ful stimulus to trade, or as a small social excitement. My remarks are entirely based upon the confident belief that photography is worthy to be wooed as a means of artistic expression, and upon a desire that its proper claims in that respect should be recognised. In this view I hold that the following conditions ought to be observed in what purport to be photographic art exhibitions.

1. That there should be no classification, and no awards whatever further than the honour implied by acceptance for exhibition.

2. That a strict and competent hanging committee should reject all inferior exhibits without fear or favour.

3. That all distinctions of amateur and professional should be entirely suppressed, all pictures exhibited being for sale unless specially exempted.

4. That the number of photographs accepted from each exhibitor be limited.

5. That each picture (save in application to decorative art) be separately framed.

In my next article I shall refer to these points, and then proceed to a brief discussion of the questions now prominent as to the constitution of boards of judges, and as to classification, opposing most strongly the hardly logical contentions against artists as judges recently published in the NEWS, and objecting to the pleas for classification put forward by some ardent photographic exhibitors.

THE EFFECT UPON TONING OF PRINTING THROUGH COLOURED GLASSES.

BY EDWARD A. GOLLEDGE.

A SHORT time ago I had occasion to interview Mr. Otto Schölzig with reference to his now well-known sensitised paper, who, after having most kindly afforded me the information required, submitted to my notice some samples of paper which had been exposed to light through some coloured celluloids; I was struck with the remarkable effect of the various tints obtained by the light acting upon the silver paper after passing through the various coloured mediums, more especially as the toned specimens produced totally different effects to that obtained when printed in the ordinary manner. I lost no time in putting the experiment to a severe test, and the result of my experiments in this direction I now desire to place before my readers.

I have tried printing through the following colours: blue, ruby, orange, yellow, and green, and it is really surprising to note the variety of tone that may be secured by the various methods. I shall mention that my aim has been to obtain as pure a black as possible, and my experiments have certainly been rewarded with success far beyond my expectations.

Of all the colours experimented with, I find green, yellow, and orange give the best results.

Blue glass seems to have very little effect unless it possesses a decided greenish tint. Ruby glass I have discarded altogether for securing a black tone in the finished print, and the very best results are obtained when employing green glass of a somewhat deep colour, and printing in direct sunlight. I have not found any marked difference in the effect produced when printing in the shade, and of course the time occupied is much prolonged.

My experiments have been conducted solely with Schölzig's matt surface and other papers of his manufacture, and although they have been carried out in a very hurried manner, I feel convinced that many advantages may be gained by adopting the method referred to.

The appearance of the print before toning is somewhat peculiar, inasmuch as it is in colour a beautiful purple brown, a colour one is so anxious to obtain, as a print of this description (which I never secured by any other means) is in excellent condition for the toning bath. My difficulties hitherto have been to get other than the brown tint, which colour will not tone to the desired black. It would appear to me—not over well acquainted with the chemistry of photography—that the action of the light upon the sensitised paper is similar to that of crystallisation. In order to obtain good crystals it is necessary to allow time for them to form, and the crystals are deposited in certain parts of the vessel only, in bold form. Quicken the process by violent evaporation, and we obtain a shapeless mass of small crystals all over the vessel. The printing process appears to be a kind of crystallization, the chlorine of the silver chloride being freed, and silver sub-oxide being deposited in a crystallised form. It is acknowledged, also, that slow printing produces better detail than quick printing, but it was not until I had experimented that I discovered that various coloured silver oxides or sub-oxides, precipitated under various coloured lights, had each an entirely different affinity for the gold in the toning bath, and that the one took the deposit of gold rapidly, whilst the other refused to take it altogether. There is no doubt that the tones obtainable by the method I describe on matt surface paper are quite equal to the best results ever obtained by any of the platinum processes. . . . Mr. Schölzig is certainly to be congratulated on having been the prime mover in this most important discovery, to improve, if not to perfect, the tones of the silver print, both matt as well as albumenised.*

In order to get the best effect, it is necessary that the paper should be printed *very deeply*—in fact, so deep that detail in the shadows is quite lost. I have found that in printing from a negative in which some parts are dense, owing to halation or some other cause, it is necessary to carry on the printing until detail in the densest part appears; this does not appear to affect the other part of the picture, which, under ordinary circumstances, would be much over-printed; also when printing from a weak negative, much finer results may be obtained by using the green glass than if printed in direct light; in fact, I am of opinion that intensification of negatives will be rendered quite unnecessary if, when printing, the precaution is taken to print through the green or yellow glass; of course, the time occupied in printing is longer, but to my mind this is no drawback to the process. For want of time my experiments have been somewhat limited, but perhaps this may come under the notice of some one who may be able to devote time in experimenting with various tinted glasses; there is certainly a wide field for research.

The after manipulations are much about the same as with ordinary printing, but when using the matt surface paper, the prints simply require a *rinse* in one water before placing in toning bath. I recommend the following bath for *pure black* tones:—

Borax	1½ drams
Uranium nitrate	4 grains
Gold	3 ,,
Water	24 ounces

Of course, if a quantity of prints is to be toned, more

* Mr. Scholzig has shown us some prints with exceedingly rich black tones produced as stated.—ED.

gold should be added, but with the bath above given I have toned from 2½ to 3 dozen whole plate prints on the matt surface paper. It is necessary to replenish the bath with gold if it becomes weak, and the same solution may be used several times, providing gold has been added.

The tungstate and phosphate bath, as recommended by Mr. Schölzig, gives fine dark tones on the matt surface paper. The time occupied in toning this paper is but a few minutes. I place the prints in salt and water, and fix in the usual manner.

The enamel and brilliantly albumenised papers take longer to tone, and it is as well to wash thoroughly before toning, and place in the last washing a dram or two of carbonate of soda. Tone until all brown has disappeared when viewed by transmitted light, and place in salt and water and fix in usual manner with a drachm or so of ammonia added to the bath. Fine black tones may be obtained by this method, although any range of tone may be had, according to fancy.

It is possible some of my readers have already tried the experiment I have endeavoured to describe, but to myself it is entirely new.

While conducting my experiments I have found that, when using deep ruby glass, the time occupied in printing is considerably less than when using yellow or orange; this fact is worth knowing, as it touches upon another branch of photography, and will encourage amateurs to use more light in their dark rooms. For my own part, I always use twelve inches of orange glass, and have developed the most rapid plates in the market without a mishap; but I feel I am encroaching upon another subject, which is not my intention. Silver printing with green glass and gold toning is my subject, and I must leave my readers to experiment and judge for themselves.

Since writing the above, it occurred to me that the prints toned in the bath with the uranium might not be permanent; I therefore placed several of them (matt and albumenized) in a strong solution of nitric acid and water for many hours without the slightest change taking place, proving beyond doubt that the tones obtained are the result of a deposit of gold, and therefore permanent

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THE East Dulwich Society has purchased, for loan to members, a 12 by 10 camera and lens, which was on view on June 6th.

LACK OF SYMMETRY IN THE EYES.—When the average man or woman comes to be fitted with the first pair of glasses, some curious discoveries are made. Seven out of ten have stronger sight in one eye than the other. In two cases out of five, one eye is out of line. Nearly one-half the people are colour-blind to some extent, and only one pair of eyes out of every fifteen are all right in all respects.

A TONING BATH.—MM. Detaille Bros. say that when equal parts of a 15 per cent. solution of sodium hyposulphite, and of a 10 per cent. solution of alum, are mixed, a precipitate is produced, and the formation is so slow and continuous that the authors found a precipitate to be forming three months after the mixture of the solutions in the cold. A transparency placed in this solution tones slowly, the colours of the image varying from a dark brown to a reddish violet. An analysis is given of the precipitate: it contained 30 per cent. water, 28 per cent. alumina, and 38 per cent. of sulphur, consequently the authors infer that the toning is due to the action of nascent sulphur, and a plate of silver immersed in the solution for several days became quite black. The best results are obtained with gelatino-chloride plates. If the mixture be diluted with from two or three times its volume of water, it may be used to tone paper prints (fugitively?). The Mawson chloride plates are said to give very good results with this toning solution.—*Bulletin Belge.*

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

NEW SENSITOMETER—DEVELOPMENT OF GELATINO-CHLORIDE PAPERS—BLISTERING OF ALBUMEN PRINTS—STAINED NEGATIVES—JUDICIAL PHOTOGRAPHY—HELIOCHROMY—BIBLIA PAUPERUM.

A New Sensitometer.—A clever modification of the Warnerke sensitometer has been suggested by Mr. R. E. Liesegang. In order to obtain a more even gradation of the intensities of the light on the sensitive plate to be tested than can be obtained by superimposing a number of strips of paper, he makes use of the well-known optical law according to which the intensity of the light diminishes with the distance. It will be remembered that in Mr. Warnerke's instrument the phosphorescent and the sensitive plate are placed parallel; Liesegang, on the contrary, arranges them in a certain angle—of 45 degrees, for instance. The action of the light on the gelatine plate naturally diminishes more and more with the distance. If, now, a number of threads be drawn in front of the plate, to keep off the light, it can be determined after development how far the light has acted, and a deduction can be made, as in the case of the Warnerke sensitometer, of the sensitiveness of the film. This method offers also the advantage that a narrow strip of the edge of the plate is sufficient for the trial, and that the plate tested may afterwards be safely used for making an exposure. Instead of keeping off the light by means of threads in order to produce the white lines on the plate, it will be sufficient to draw on the plate parallel lines with a concentrated solution of potassium bromide, to render the lines insensitive, so that in developing they will remain white.

The Development of Gelatino-chloride Papers.—In the newly opened flash-light studio of Professor Schirm, of Berlin, the lighting arrangements of which I have described on a former occasion, all the prints are made on development paper exclusively. For prints made by contact, Dr. Just's gelatino-chloride paper is used with the best results. About the mode of development, Mr. Wilh. Steiner, manager of this establishment, gives some practical hints in the *Mittheilungen*. It makes no difference, he says, whether the ferrous-oxalate, the hydroquinone, or the eikonogen developer be used, they all being equally suitable for the purpose; but the alkali developers are to be preferred, on account of their exceeding cleanliness, and because they may be used repeatedly. In order to obtain a pure black gelatino-chloride print, equal to a platinum print, a relatively strong developer with a large quantity of any alkali—such as potassium or sodium carbonate—should be used, to dispense with as much light during exposure as possible, for plenty of light gives brown tones, whilst they are blackened by the alkalies. As, however, bluish-black tones are obtained by too large a quantity of alkali, it is necessary to take the golden mean between light and a strong developer, and this is effected by the use of a restrainer of potassium bromide by preference, which allows an exposure giving brown tones, and at the same time a strong alkali developer giving black tones. By this means a beautiful rich mixed tone is obtained, in which the brown appears only like a warm sepia-coloured glazing upon a black image. Care should, however, be taken not to use too great a quantity of the restrainer, as in this case a loamy, greenish-brown tone is liable to appear.

Blistering of Albumen Prints and its Prevention.—At a

meeting of practical photographers which was held some days ago, an interesting discussion took place about the blistering of albumen prints. It was rightly said by a member that the disease is connected with the present mode of preparation of the albumen paper, and that the paper of the early days of photography did not blister, because then it was albumenized with fresh egg-albumen, and not mixed, as now, with blood-albumen, the properties of which are different in some degree. It absorbs, for instance, the oxygen from the air more rapidly than egg-albumen, disengaging carbonic acid. It was remarked that this interesting phenomenon of slow combustion would, perhaps, be a cause of alteration of the prints. Many a remedy for the defect was then given, most of them being probably well known to the profession, but the following one, which was said to be originally described in a German contemporary by Herr Rudolph, of Hof, seems to me especially certain in its results, and therefore to be recommended. After toning, the prints are rinsed and piled up one upon another, the larger sizes being laid separately, also the cabinets and the smaller prints. They are then, every size separately, laid between smooth oil-cloth, and the latter is placed on a smooth board and pressed with a squeegee until the prints become slightly transparent, which may be seen best by reflected light, looking at the back of the prints. They are then once more rinsed and placed in the fixing bath. Prints treated in this manner, it is said, never blister, except perhaps at the edges, if not correctly piled up; this being, however, of no consequence, as the edges are cut off. The whole manipulation, which is completed within two to five minutes, is very simple and effective, and besides, it is much cheaper than many of the other well-known remedies.

Stained Negatives.—A very effective method of restoring gelatine negatives showing the well-known yellow stain has been introduced at the Imperial Institute for Photographic Researches, of Vienna, by Mr. Robisheck. The plate is at first carefully freed from its varnish by means of alcohol, washed with water, and then placed in a dilute aqueous solution of bromine, which is obtained by adding a few drops of bromine liquid to about half a pint of ordinary water, and which is then, together with the plate, exposed to the direct sunlight. The action of the bromine very soon becomes apparent. The yellow stain disappears, and it then is well to watch the further progress by transmitted light. After the image has become clear, which requires six to eight minutes, according to the degree of concentration of the bromine solution, the plate is placed in alcohol, to remove the rest of the bromine, and then dried. In this way the restored negative can be re-used within a very short time. The results are said to be very satisfactory.

Judicial Photography.—Of the high importance of photography for judicial purposes, the following incident gives evidence. Some weeks ago, a letter which had been written twenty years ago by a convict—who is still a prisoner—was presented to Professor Max Müller, of Brunswick. On the second page of the letter there were written about five additional lines, apparently with a colourless or slightly coloured liquid; but the writing was undecipherable. Only the existence of written characters could be seen if the letter-paper was held against the light, so that the latter was reflected in the well-known manner to the eye. According to the declaration of the attorney-general, urine had probably been used by the prisoner for writing. Various chemists to whom the letter had been previously presented had not been able to develop the writing by treatment with chemicals. Prof. Müller at first himself made experiments with urine writing, and found that written characters of this kind may be easily made readable if the paper containing them is heated until it begins to turn yellowish. The written characters will then become visible in a dark brown colour. When the above-mentioned letter was treated in the same way, only a very slight yellowish tint was imparted to the writing, so that, whilst the existence of written matter could undoubtedly be stated, it was still impossible to decipher it. Now it occurred to Prof. Müller to take a photograph of this portion of the letter—on an ordinary gelatine plate, of course—and when the latter was developed, it showed the written characters very distinctly, so that they could be entirely read without any difficulty.

Heliochromy.—At the last meeting of the Berlin Society for the Advancement of Photography, which took place on Friday, the 16th of May, a letter of Herr Eugen von Gothard, of Hereny, was read, which contained interesting information about the progress made of late by Herr Fr. Veress in his experiments with photography in natural colours. According to this communication, Herr Veress has succeeded in increasing the sensitiveness of his emulsion so much, that it is now possible to produce a picture in which the colours are rendered much better than formerly within fifteen seconds, whilst in his former experiments he required two to three hours to attain a similar result. Herr v. Gothard, in his letter, promises to send shortly a number of the new pictures produced by Veress.

A Photographic Reproduction of the Biblia Pauperum.—The "Biblia Pauperum," as it will be known, is one of the most eminent productions of the art of printing, belonging to a time prior to the great invention of Gutenberg. The pictures, together with the descriptions, were cut in blocks of wood, and then inked up with the ink-ball. Upon this inked-up woodcut was placed the moistened paper, and pressed with another ball, the so-called brayer. In consequence of this imperfect mode of printing, certain inequalities with regard to the colour, and some unclear and unsharp portions were produced, and at the same time the fact revealed that the back of the paper could not be printed in consequence of the relief, resulting from printing the front side. One has repeatedly tried to reproduce these old block-printings by drawing, but all these reproductions are more or less imperfect on account of the fact that one has always anxiously avoided reproducing also the defects, *i.e.*, the uneven printing, the partial unclearness, and broken lines which form the characteristic sign of the block-printings, and an important support to the researches in the arts. By the aid of photography perfect duplicates can be produced, showing all the characteristics of the old mode of printing. Of this fact the beautiful reproduction of the "Biblia Pauperum," which has recently been issued by a Vienna publisher, gives evidence. It has been produced by means of the photo-mechanical processes, proving in this form the immense value which photography possesses in connection with the investigation of the arts.

In *Burgoyne's Monthly Circular* for this month, bichloride of platinum is quoted at twenty-eight shillings an ounce, nearly double the price it bore a few months ago.

DEVELOPERS USED BY GERMAN PROFESSIONAL PHOTOGRAPHERS.*

BY JULIUS F. SACHSE.

CATHARINA CULIE, Frankfurt, a. M.—Developer—Iron oxalate. Advantanges—For portraiture, when the artist has complete control of the lighting and exposure, I consider a developer which always works evenly as the most desirable, and that one is the iron oxalate. I have not been able to obtain equal results as to detail or lights with any other developer. It is also cleanly, and its use is not harmful to the skin. Composition—Iron, 1-3; oxal. pot., 1-4. Developer — 1-4. Accelerator — Always 30"—1-2,000.

R. Fath, Halberstadt.—Developer—Ferrous oxalate. Advantages—In comparison with all other developers, quicker action, with greater modulation. Composition—1-3. Accelerator—Negatives of children and copies, a bath of soda.

F. W. Geldmacher, Frankfurt, a. M.—Developer—Oxalate of potash and iron. Advantages—That I rarely lose a plate by over or under-exposure, a property which I cannot reach with any other developer. Composition—Potash, 1-3½; iron, 1-3; hereof 3 parts potash, 1 part iron dissolved in hot water. Accelerator—Water, 1 litre; hypo, piece as large as a pea, soak 1 min.; fix without washing.

Prof. E. Hanfstaengle, Frankfurt, a. M.—Developer—Exclusively oxalate. Advantages — Absolute freedom from fog. Composition—(A) Oxalate of potash, 1 kg.; water, 4 kg. (B) Sulphate of iron, ½ kg.; water, 1½ kg. For use, 1 part iron to 3 parts oxalate. Accelerator—Hypo for child exposure only, dissolve 1½ g. hypo in water 20 c.cm.; of this solution take 1½ c.cm. to 500 c.cm. water.

Fr. Kahlmeyer, in Osnabrück.—Developer—Ferrous oxalate. Advantages—Simplicity, cheapness, cleanliness. Composition—(A) 1,000 V; (B) 250 g. Neutral oxalate of potash crystals; 3 parts A, 1 part B. Accelerator—For short exposures add to developer 10 g. hypo solution 1 : 200.

N. Leyendecker, in Berncastel. — Developer — Iron oxalate. Accelerator—None.

Fr. E. Marr, Zweibrücken. — Developer — Ferrous oxalate. Advantages—Any desired intensity and fine gradations can be obtained. Composition—Both solutions are made 1 : 4, and for use mixed 1 : 4. (I only use extra heavy plates.) Accelerator—Plates receive ample exposure, and are developed with much bromide, also when hypo accelerator is used.

Peter Risse, in Duisburg.—Developer—Ferrous oxalate. Advantages — Surety. Composition — Both solutions saturated. Iron added according to circumstances, relative to lighting, exposure, and plate. Accelerator—Only occasionally, and then 1 part hypo, 2,000 water.

Arnold Overbeek, in Düsseldorf.—Developer—Iron and oxalate of potash. Advantages—Simplicity and great latitude. Composition—1 iron, 3 oxalate. Accelerator—With short exposures, hypo 1 : 5,000.

A. Sternitzki, Brannschweig.—Developer—In general oxalate, with short exposures (children), hydrochinon. I miss, however, here the important question, "What plates?" as in my experience, the various developers do not act the same with all makes of plates; for instance, with English and some German plates, I should decidedly prefer pyrogallol, while in the portraiture of children with the "Schleussner" plates I would use hydrochinon. Advantages—Oxalate gives with Monckhoven plates, which I mainly use, a clear picture with fine detail and clean plates; but even here it depends on the different emulsions, and often to obtain suitable negatives I resort to hydrochinon. Composition—Oxalate, both solutions saturated, and used in proportion of 1-3 to 1-4. Hydrochinon and pyrogallol according to the usual formula. Accelerator—Only unwillingly; I would much rather add a little hypo to the developer.

Carl Bellack, Leipzig.—Developer—Hydrochinon; also a mixture of hydrochinon and eikonogen. Advantages—More rapid appearance of image and completion of development with nice contrasts. Eikonogen alone works to monotone, and requires too much time for intensification. For very short exposures, eikonogen answers to start the development; hydrochinon to complete the reduction. Composition—(Hydrochinon No. 1) Water. 2,000; sulphite of soda, 180; hydrochinon, 30; carbonate of potash, 180-200; for under-exposures, warm developer to 50° R. (Hydrochinon No. 2) Water, 1,000; sulphite of soda, 90; carbonate potash, 120-150; hydrochinon, 1: for extra short exposures, children, &c. Commence development with No. 2; after detail is out finish with No. 1. (Eikonogen) Water, 1,000; sulphite of soda, 90; carbonate of potash, 40; carbonate of soda, 10; eikonogen, 20. A developer composed of hydrochinon and eikonogen as above will be found advantageous in certain cases. Accelerating bath—Never.

Theodore Klauer, in Offenbach a. M.—Developer—Hydrochinon. Advantages—Softness of shadows, with relative short exposure. Composition—(A) Water, 500; sulphite of soda, 50; hydrochinon, 10. (B) Water, 400; soda, 50. For use, 3 parts No. 1; 4 parts No. 2. Accelerating bath—Sulphite of soda, 50; water, 1,000; hypo, 2.

C. Hertel, Hofphotograph in Mainz.—Developer—Pyro-soda. Advantages—(1) Clean work; (2) great latitude of exposure; (3) black tone. Composition—(A) Solution of sulphite of soda, 1-10; pyrogallic acid, 1-5 per cent. (B) Solution of soda, 5-10 per cent. Equal parts A and B. Accelerating bath.

(To be continued.)

* Continued from page 416.

THE PHOTOGRAPHIC CLUB.—The subject for discussion on June 18th will be "Mounting and Finishing Photographs;" June 25th, "Matt Surface Printing."

AMERICAN REPRODUCTIONS.—In photogravure reproductions on Japanese paper and satin, the Lithotype Publishing Company, Gardner, Mass., make a specialty of reproducing proofs in the shortest possible time after they get to this country, and many times they have their prints ready for delivery before the proofs have been shown out of New York. The firm have added over one hundred subjects within the past year, and probably have the largest number of new subjects of any publisher in this country. In the copyrighted line, taken from American paintings, the picture, "The Mishap," a charming bit of child-life, has had a large sale.—*Picture and Art Trade.*

ETCHING METALS.—The Berlin *Papier Zeitung* describes a method of etching metals, such as zinc, from which it is desired subsequently to take prints. The image is transferred in the ordinary way to the surface of the zinc plate, which is backed with asphalt, and immersed in a bath of dilute acid. One terminal of an electric current proceeding from a dynamo is connected with the liquid, the other with the zinc plate. As soon as the current passes, the metal commences to be attacked with such rapidity, that in a few minutes the exposed portions are eaten into the depth of the thickness of a sheet of paper. In this manner the zinc may be very rapidly etched to any depth desired.

THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

THE fifty-eighth annual exhibition of this Society will open at Falmouth on Tuesday, 26th August, and continue open for five days. Medals and prizes are offered in various departments, including photography.

The following are the general regulations:—

1. All exhibits must be forwarded so as to reach the Polytechnic Hall, Falmouth, not later than Tuesday, August 19th, after which no article will be eligible for competition, and no space can be guaranteed.

2. All pictures and photographs must be framed; and if left at one of the following places of the Society's authorised agents on or before Tuesday, August 12th, will be conveyed from these depôts to and from the Exhibition free of charge, namely:—Messrs. Worth and Co., Cathedral Yard, Exeter: Harris and Sons, 197, Union Street, Plymouth; J. Mitchell and Son, 15, Bedford Street, Plymouth; and Thomas Solomon and Co., King Street, Truro. The agents will not receive any article unless delivered to them free of conveyance and other charges.

3. The carriage of all other articles must be paid by the exhibitor.

4. All cases and packages sent to the Exhibition must be addressed "The Royal Cornwall Polytechnic Society, Falmouth," and must bear the name and address of the owner; the covers to be fastened with screws. The exhibitor must write on the back of each picture his name and address, its title, whether it is an original or a copy, the name of the artist, and whether he is a professional or an amateur. The works of professional artists may be sold from the gallery, through the secretary of the Society, Mr. E. Kitto, and a commission of five per cent. will be charged thereon.

5. Exhibitors must enter all articles intended for exhibition on forms provided for that purpose by the Society, which may be obtained from the secretary, or any of the above-named authorised agents.

6. This entry form must in all cases be returned to the secretary on or before August 9th.

7. The Society will not be answerable for loss of or damage to any article sent to the Exhibition, but every care will be used to prevent injury while in the Society's possession.

8. After admission no article may be removed until after the close of the Exhibition (this regulation does not apply to the photographic department for this year).

9. Discretionary power is vested in the officers of the Society as to exhibiting any article sent.

10. Board of Trade protection is granted to all new and unpatented inventions.

The judging in all departments of the Exhibition (shorthand excepted) will take place on Monday, August 25th.

The following are the regulations specially affecting photography:—

In all cases state whether the work is professional or amateur, and name process of production. All work sent for competition must have been executed within eighteen months of the date of this Exhibition. Carte-de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty.

Professional Photographers.—Medals are offered by the Society for meritorious productions in the following subjects:—(1) Landscapes, (2) Portraits, (3) Composition Pictures, (4) Instantaneous Pictures, (5) Interiors, (6) Six Pictures in Platinum, (7) Transparencies for Window Decorations, (8) Pictures by Improved Processes, (9) Enlargements. All enlargements for competition must be the work of the exhibitor.

Amateur Photographers.—Medals are offered by the Society for meritorious productions by amateurs.

Photographic Appliances.—Medals are offered for improved apparatus and appliances. All exhibits in this department must be accompanied by a written explanation of their special features.

Information respecting the Photographic Department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate (member of the general committee).

The Art Union of Cornwall (under the sanction of the Board of Trade) selects its prizes from the works exhibited by professional artists. The drawing for prizes will take place at the Polytechnic Hall during the Exhibition, viz., on Friday, August 29th, 1890. Information respecting the Art Union may be obtained from the honorary secretary, W. W. J. Sharpe, Falmouth.

All information may be obtained personally, or by letter, on application to the secretary, Edward Kitto, F.R.Met.S., the Observatory, Falmouth.

JAPANESE MULBERRY-BARK PAPER.*

BY A. LASENBY LIBERTY.

THE variety of purposes for which paper is used in Japan is not a little astonishing, including as it does such widely-differing objects as overcoats, window-panes, string, and pocket-handkerchiefs. One of the most pleasing sights I ever witnessed was at the Government paper factory at Shiebu-Ogi, where we watched hundreds of intelligent little Japanese girls and women, clad in spotless white robes, preparing the mitsumata, the bark of the paper-mulberry, or dipping and arranging the snowy layers of pulp on the rectangular straining sieves. I have here a few samples of paper given me on the occasion of this visit. It has the usual characteristics, toughness and a silk-like surface. Very little paper is exported, notwithstanding its manifest excellence, as it is costly, and the cultivation of the paper-mulberry tree (cuttings of which are forbidden to be exported) is at present confined within a somewhat limited area. The present Government are bestowing great attention to the paper industries, and experimenting with pith, old silk rags, and many kinds of vegetable products. At Shiebu-Ogi they manufacture all the chemicals used in the different processes, and the number of workers employed is quite astonishing. Paper is also made by hand labour in small quantities and varying qualities in scores of the towns and villages, and, for fibrous toughness, is far superior to European paper. The excellence of certain kinds of Japanese paper for prints and etchings need not be emphasised.

ALDEHYDES IN PHOTOGRAPHY.—The well-known property of the various aldehydes to reduce silver to the metallic state from an ammoniacal solution of silver nitrate, especially when warmed, has suggested their application to photography. But their use has hitherto been impracticable on account of their strong odour, their insolubility or difficult solubility in water, and the facility with which they are oxidised on exposure to the air. But most of these aldehydes, and especially formic aldehyde, are susceptible of combining with the acid of the bisulphites of the alkaline metals, and producing compounds which are readily soluble in water, and which appear capable of being used with advantage in many ways in the various photographic processes. Already two German chemists have patented the use of the compound produced by uniting formic aldehyde to bisulphite of soda. No experience, to speak of, has yet been gained as regards the new product, and it is not certain that it will present any practical advantage over the reduction agents already employed. It is asserted, however, that a very minute quantity of it added to the gelatine emulsion, either during its manufacture or after it is applied to the glass plate, renders the sensitive film very much more sensitive than it is without this addition, and that it may also be used in the developing bath with success. These aldehyde compounds have a marked affinity for bromine and iodine also.—*Burgoyne's Monthly Magazine.*

* A portion of a paper read before the Society of Arts.

Notes.

The French, with their love for precise nomenclature, have given to photographic science a new term—chrono-photography. Chrono-photography, expanded in our somewhat cumbrous language, means the art of taking photographs in a series of measured spaces of time, and examples may be cited in the experiments of Marey, Muybridge, Anschutz, and others. In an article on the subject which appeared recently in *La Nature*, the writer glanced at the various methods in use, the principal of which appear to be three in number:—First, that employed by M. Marey in photographing the flight of pigeons, by an arrangement which brought the bird against a perfectly black background; secondly, the plan which made the sensitive surface move in a series of equal jerks across the focus of the lens; and thirdly, the use of as many independent cameras as might be deemed necessary. These three comprise the methods which have produced results known to the public.

But, as the writer in *La Nature* remarks, "all has not yet been said on this interesting question," and inventors are still busy studying the subject. An apparatus which was highly spoken of was exhibited at the Paris International Exhibition, and, in 1888, Mr. W. G. Levison presented to the Photographic Academy of Brooklyn a new apparatus, holding the sensitive plates in a revolving drum, to bring them one after the other rapidly to the focus of the lens. Mr. Friese Greene's "mitrailleuse" camera, and the apparatus of Mr. C. V. Boys, have already been described in these pages.

Photographers who lay themselves open to be twitted for producing incongruous effects—as, for instance, when the landscape is lighted from one side of the picture, and the put-in "natural clouds" from the other—may now take refuge in the defence that painters are not at all squeamish in regard to incongruities. A case in point may be cited from the Academy. One of the artists, it seems, has introduced into a landscape the representation of a fern against which, from a picturesque point of view, there is nothing to be said, but from a botanical aspect, a good deal; for a critic who is also a naturalist declares that the fern in question is of a rare sort, and grows only in two places, neither of which is the locality indicated in the picture. The artist cannot explain satisfactorily how he came to contradict nature in this way, and the inference is that he must have borrowed the plant from a friend's conservatory.

What with photography on the one hand watching over their errors, and candid critics on the other looking out for slips, the artist now-a-days must speak by the card. Jacob dreaming of the ladder to heaven, and arrayed in the attire of a Flemish peasant of the sixteenth century, as represented by a well-known Dutch painter, would not now be tolerated. It is even possible whether doubts, in these critical days, would not be thrown upon the graceful silver birches which Turner found so effective in the composition of his pictures. They were introduced with such suspicious frequency, that the chances are that some careful inquirer might, if he had cared to take the trouble of comparing the picture with the scene depicted, have discovered that the silver birch, like the photographer's cloud, was put in. To discuss the question whether, as Lord Lytton was fond of declaring with the use of capital letters, the True and the Beautiful are one, or whether each can exist apart, would take too long just now, and we must leave the problem where it is.

The *Bulletin de la Societé Francaise* contains an interesting memoir of its late president, M. Peligot, whose death we announced recently. M. Peligot, like many other men whose researches have done so much for the progress of photography, was not a practical photographer, but his experiments in respect to the chemistry of photography resulted in much practical good. In 1855 he brought before the French Photographic Society the advantages of the double chloride of gold. He was one of the earliest to draw attention to the effect of light in colouring glass, and his repeated cautions as to the dangers of certain artificial illuminants will be well remembered. He succeeded M. Balard in the Presidency of the French Society, and was re-elected annually.

Photography is a source of income little suspected. Most people have noticed the photographs on cigarette boxes, and the attractive-looking pictures which are exhibited in tobacconists' windows, but few imagine what it costs to produce them. In the United States this method of advertisement is carried on to a much larger extent than in England. The latest business amalgamation is that of the cigarette-making firms, and one result of this will be that £17,000 a year on photographs alone will be saved on a "trust," working upon a capital of a million. The photographic adornments on cigarette boxes may appeal to American citizens, but the attraction is played out in England, and fortunately there is little chance of this "trust" being brought to the notice of English investors.

A graceful compliment has been paid to the granddaughter of Nicéphore Niepce at the last meeting of the Societé Française de la Photographie. Some time ago it was decided by the French Government, on the recommendation of the Societé, that a Jubilee medal should be struck and engraved in honour of the fiftieth anniversary of Daguerre's discovery; and it was decided by the Societé that the medal should be presented to Mdlle. Niepce on the occasion of her marriage.

The competition organised by the French Minister of Public Instruction for a prize of £80, to be competed for with the object of providing apparatus especially suitable for the requirements of tourists,

has just been decided. The decision had been postponed for some time on account of the lack of competitors; but eventually a respectable number presented themselves, and after numerous trials made by the committee appointed, a conclusion was arrived at. The conditions were that each competitor should send two lenses, one a panoramic lens of at least 100 degrees, and the other of a smaller angle, but possessing certain qualities—that is to say, rectilinearity of the lines, flatness of field, sharpness of the different planes, and equal illumination.

In the panoramic competition, M. Adolphe Martin has gained the award. In the second competition the lens shown by M. Berthiot fulfils all the conditions desired, in spite of the weight being somewhat excessive. It has therefore been decided to divide the prize offered by the Government into two equal sums of £40 each, which will be awarded to each competitor.

The photographer is a necessity at all public functions, and it may not be long before he will be considered equally necessary at private ones. We are constantly reading of the matches of the Australian cricketers being interrupted in order that the teams may be photographed. A youthful foreign prince who has achieved a little cheap notoriety arrives at Dover, and the ubiquitous photographer is seen on the bridge of the steamer struggling to take a picture of his reception. A deputation waits upon an eminent statesman in an informal way, and the photographer is on the watch to secure a memento of the visit. By and bye the services of the photographer will be as commonplace a thing as the services of the hairdresser. A photographer will follow the monthly nurse and the doctor, and newly-born babies must look forward to being photographed as well as being registered. The camera will pursue one at every stage of existence, from the first tooth upwards. Indeed, if the automatic photographic machine is going to prove the gigantic success so confidently predicted for it, it will be more convenient and more economical to have an apparatus set up in the hall, and consult it every morning as one does the barometer.

It will be a comfort to sober-minded people to know that the various idiotic competitions which have gradually been becoming a feature of modern journalism have been declared illegal, and that they will perforce be discontinued. The information which the solution of the questions proposed made known was generally of no use to anybody, except, perhaps, the winner of the prize, and it probably did him more harm than good. If any photographers should hanker after some similar vent for the display of their abilities, they can easily find plenty of problems which await solution—for there are worlds yet left unconquered for aspiring Alexanders in our art. One of them occurs to us. Why should a negative benefit by unlimited supplies of water, while it remains wet and fresh from the fixing bath, and yet be spoilt by an accidental splash which may reach it when dry?

What we mean is this. Many a good negative has been ruined by a single drop of water accidentally falling upon its film after it has been dried. The water may be *aqua pura* in the fullest sense of the words. It may be rainwater freshly distilled from cloudland, tap water, or any other water, but where the drop falls it will act as a reducer, and a spot—light by comparison with the rest of the negative—remains upon the film for ever. No one has yet, so far as we know, explained why this should be so, but there is no kind of doubt that water acts in the way described.

If the water were contaminated with hypo there would be nothing to be surprised about, for hypo has a distinct reducing action in the presence of air. This fact, we believe, is not generally known, but it can be easily put to the proof in the following manner: Take a negative fresh from the fixing bath, give it a good rinsing under the tap, and then transfer it to a pan of water deep enough to cover one-half of the film as the plate stands on edge. At the end of half an hour or so, the plate will be found, upon examination, to be much less dense on the half exposed to the air than it is on the other half which has been below water. It is unnecessary to point out that here we have a simple and easy method of reducing an over-dense negative.

We have always regarded the introducer of cheap apparatus as a benefactor to the art of photography and its votaries—provided that it is so constructed that it is capable of taking some kind of presentable picture. Many a good worker has begun with a cheap set, and has thus acquired a taste for the art, and in good time has provided himself with something better. So far, so good. But we have lately observed that certain apparatus has been introduced which can be bought for a few shillings—with chemicals and everything complete. Boys at school are commonly the purchasers of it, and when they have saved up their pocket money for the purpose, they find themselves in possession of a mere toy which is next to useless.

A plausible prospectus points out the wonders that can be achieved with the instrument, *including instantaneous pictures within doors*. We lately examined one of these contrivances, and found that its lens was shut in with a fixed diaphragm, which made it work at *f*/32. The boy who handed us the instrument for our opinion told us that no fewer than eight "other fellows" at his school had bought them. "Well," we said, "have you seen any negatives taken with it?" "No," was the reply; "but I've seen a lot of plates of clear glass taken with it." Let our readers caution their young friends not to waste their pocket money on such things, for clear glass can be obtained much more cheaply, and without the trouble of exposure and development.

ON REFLECTED IMAGES IN OPTICAL COMBINATIONS, AND THEIR EFFECT ON THE BRILLIANCY OF THE FINAL IMAGE.*

BY T. R. DALLMEYER.

THE first practical demonstration of the deleterious effects of internal reflections in lenses on the resulting image was contributed to your Society in 1867 by my late father, who, in conjunction with Sir John Herschel, gave both a practical and theoretical explanation of the "Cause of the Central Spot or Flare in Photographic Lenses," and they pointed out how, in certain optical systems, this trouble might be overcome or cured. As you are aware, the "flare-spot" is due to the formation of a real and inverted image of the diaphragm by internal reflections in the back lens upon the plate. With certain forms an alteration in the position of the diaphragm, either nearer to or further from the lens, may eliminate the effects of flare-spot should it exist. The general deductions arrived at by this investigation were: "First, the fewer the number of reflecting surfaces (other things being equal), the greater will be the brilliancy of the resulting image; second, the smaller the diameter of a lens, or combination of lenses, covering a given sized plate or area (other things being equal), the greater will be the brilliancy of the resulting image."

The final brilliancy of the image is, of course, not only dependent on reflected images in lens systems, but I propose to confine my remarks to this aspect of the subject this evening, taking it for granted that *proper* "flare-spot," as introduced by the arrangement of the systems and position of the diaphragm, does not exist.

The loss of brilliancy, due to reflection, in the resulting image is due to three main causes:—(*a*) The number of reflecting surfaces giving rise to a definite number of reflected images; (*b*) the disposition and curvatures of the lenses in the system; (*c*) their diameter as regards available aperture in the formation of the ultimate image.

So far as I know, this subject has only been approached from one point of view—viz., in general, the number of reflected images of the object due to the number of open reflected surfaces; but there is another, and, I am inclined to think, more important aspect—viz., the interference that the original light on the plate has upon the total light on the plate by reflection from the lens surfaces during exposure.

(*a*) By placing a number of lenses with different numbers of open surfaces in the separate systems side by side in a camera (all of the same focal length), and directing them simultaneously to a distant bright object, one can compare not only the number of images formed by the reflecting surfaces, but also the relative positions and brilliancy of each image.

By such a comparison you can estimate visually the more or less deleterious effect likely to be produced by the position of the images and their brilliancy on the resulting image. Elaborate drawings could certainly be made to show for any system the exact positions along the axis for each image, but the estimate of the relative brilliancy of each is better attained by the practical estimate. I have endeavoured, by placing a small camera at the back, to get photographic images with definite exposures to illustrate the comparative brilliancy in a number of instances, but the focus of the lens employed to show this requires to be so short to get sufficient depth with very small stops to bring them all out sharply that the images are so small as to be practically valueless as illustrations.

In any case, the number and brilliancy of these images alone cannot be a fair estimate of the resultant effect of the disposition of the components of the system on the detrimental effect of reflections as a whole. If the plate were absolutely black, and no reflections from it took place, this consideration alone would suffice, but the whitish surface upon which the image is received (and never uniformly lighted) receives again reflected images from the component elements of the lens system itself.

In order to exhibit these effects in a very pronounced degree, I have inserted an imitation plate *partly* (drawing) illuminated, and in the position of the lens various forms of mirrors, plane, convex, and concave.

The effect of these on the non-illuminated portions of the plate are, of course, very remarkable, the convex mirror having the least, and the concave the most detrimental and powerful effect.

The headings (*b*) and (*c*) are then here of very great importance. The greater the number of concave surfaces in the lens system towards the plate, the more will the resulting images suffer in brilliancy; and again, if the diameters of the lenses are large and concave towards the plate *after* the stop that determines the intensity, the more will the brilliancy diminish.

The diaphragm, then, you will understand, plays an important part on the brilliancy of the image by its situation. Were it not for reducing the angle included in a picture, there are many cases in which the addition of a diaphragm behind the lens might prove of advantage for brilliancy, but in any case these experiments show how detrimental the effect of a small stop in front of a combination with concavities towards the image behind it would tend as regards brilliancy in cases of powerful contrast, and might give rise to "ghosts" as distinguished from the proper "flare-spot."

The reason of this contribution arose originally from a controversy with Mr. W. K. Burton, in the PHOTOGRAPHIC NEWS, as to the claims of a new lens of my own, known as the rectilinear landscape lens, over the ordinary symmetrical combinations generally known as the rapid rectilinear. He has since agreed with me on the points at issue in a letter to the *Amateur Photographer*.

There were other considerations entered into besides that of reflected images, in number and brilliancy, that affect final brilliancy in the comparison of the two lenses named; but Mr. Burton, in any case, had entirely overlooked the aspect brought to your notice this evening, and I will certainly say that, although the rectilinear landscape has the advantage in the matter of number and brilliancy of reflected images, as regards its use in cases of powerful contrasts of light and shade, the form of rapid rectilinear is decidedly the safer as, stop for stop, the concave surface behind it (in the case of the rectilinear landscape) would have greater liability to produce ghost, although this might be overcome by reversing the lens in such cases.

The reflections of the light on the plate from the lens back on to the plate will easily explain the reversed images occasionally met with, of bright windows in interiors, on the darker portions of the picture when taken with double combination lenses in which there are concave surfaces towards the plate, even when "flare-spot" does not exist.

The slight amount of diffused light given by the num-

* Read before the Photographic Society of Great Britain.

ber of reflected images and the elements concave towards the plate, have often been preferred by artists as giving more atmosphere! I don't think "atmosphere" is quite the word, but as the eye in viewing nature is always filled with a certain amount of diffused light by the lens of the eye itself, so also a lens system that imitates this, to a certain extent, may be more applicable to artistic purposes, but is certainly detrimental for the highest scientific precision.

NEGATIVES.*

BY THOS. H. MORTON, M.D.

In all elementary books relating to photography we soon arrive at the terms "positive" and "negative," with an explanation thereof, and I do not know of a better than that given by T. F. Hardwich in his "Manual of Photographic Chemistry," 1857, who says, "A positive may be defined to be a photograph which gives a natural representation of an object as it appears to the eye. A negative photograph, on the other hand, has the light and shadows reversed, so that the appearance of the object is changed or negatived." We afterwards learn that the photographic image developed on a sensitive collodion film can be made either a positive or negative. The ordinary portraits by this collodion process taken on glass are examples of thin negatives converted into positives by backing with black varnish or other dark material which affords the necessary shadows; the white deposit of reduced silver, viewed by reflected light, being the positive image. If you made the deposit denser and used no backing, a negative would be the result, and, of course, any number of positives on sensitive chloride paper by contact and exposure to light can be printed.

With the gelatino-bromide process, which is generally in use for making negatives, the photographic image is not adapted to produce positives in the way just mentioned. The reason is that the reduction of silver takes place in the gelatine film, not on the surface, as by the collodion method, consequently the gelatine masks the image, preventing the reflection which assists to give a positive impression to the eye. We occasionally meet with a gelatine plate, when developed and wet, giving a distinct positive effect, and this does not appear to alter the printing quality.

The negative is to a photographer much the same as type and ink to a printer, or bears the same relation an etched plate has to the finished engraving; consequently it is our endeavour to produce a negative being a faithful exposition of the subject portrayed with the light and shadow reversed, and I shall confine my remarks principally to the gelatino-bromide film as usually manufactured. I presume there are few amateurs who prepare their own plates. Fortunately, that is not essential, as a good, reliable sensitive plate is easily obtained. Yet a knowledge of the various emulsion processes is highly interesting and profitable.

Negatives may be considered in reference to their defects, good qualities, and also the conditions which act favourably, or the reverse, in their production. In the first place, many defects are due to some error in the manufacture; these imperfections are less common than formerly, owing to accurate methods adopted by the makers, but we meet with troubles of this kind yet; some are not apparent until after the plate is exposed and developed. (Several examples are on the table.) Insufficient emulsion, too thin coating on the glass plate, shown by the image appearing through the back of the plate rapidly during development, and inability to get density and contrast; result in a thin, weak negative.

Impurities in the emulsion.—Some particles find their way in during preparation, or settle upon the plate when coating. Wool or cotton fibres, or hair from the head or face. I have noticed dust uncommonly like snuff, but I should think no well-regulated factory would allow an operative to indulge in this luxury. I believe special provision is made in the way of clothing and surroundings to obviate contamination by dust, &c. Finger markings, or greasiness of film, are troubles, likewise pinholes—cup-like depressions, due to bubbles in the emulsion—and scratches of film, either by careless handling or small fragments of glass in cutting. The way in which plates are taken out and re-packed after exposure is a source of anxiety, and I question which is the best plan—grooved boxes, or packing film to film, or inserting a narrow edge of paper between at the margin. The last plan appears most sensible, providing the paper is chemically pure, and only just sufficient to overlap, say, a quarter of an inch. Grooved boxes are doubtful; I have found plates impaired by long keeping in this way; the passage of air, even when light is perfectly excluded, has a detrimental action on the silver salt. Also frequent unpacking or retention in dark slides for any lengthened period, as air is not always pure, nor yet dry. As regards ordinary paper, when overlapping the film, an insensitiveness to some extent is noticed on development; quarter-plates suffer most in proportion; we lose part of the picture. Pressure on the film has been given as a cause of insensitiveness, but hyposulphite of soda is present in many papers. You can readily detect this salt by the starch and iodine test.

It is also alleged that white paper, although quite pure, will affect a bromide film, by reason of inherent luminous property; yet I have a number of plates originally packed with tissue paper many years old, which act as quickly and efficiently as a new batch

Leaving the accidental defects of plates, we may now consider the good qualities of a negative, and how obtainable. Assuming the bromide film to be perfect, and properly exposed on a well-lighted subject—either portrait or landscape—what are the conditions required to secure a first-class result? There really is not much beyond care and judgment during development; and allow me to remark, in passing, that a deep chemical knowledge is by no means absolutely essential, or how could the tyro of a few weeks produce a negative from which a print might gain him a medal at some exhibition for technical excellence?

As I before remarked, we have to make a negative which shall be a faithful copy of the subject portrayed, having the light and shadow reversed. Although the theory of the invisible or latent image caused by light, and transformed into a visible one by certain reagents, is not quite clear, we are led to believe that the action of light rays from a reflecting object through a lens affects the sensitive bromide in a variable degree according to its intensity, exerting a photo-chemical or physical change, attended with the liberation of a certain proportion of bromine. This disturbance is most in the part struck by brightest light rays—say, in a landscape, from the sky;

* Read before the Sheffield Camera Club.

and the rays from clouds and other white objects penetrate deeper into the film than those from darker bodies.

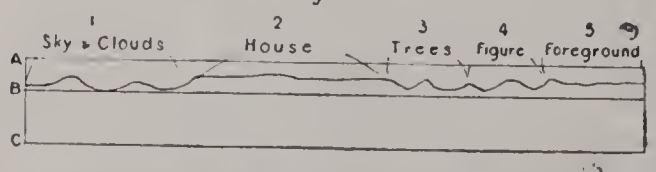
The change so far is an impression or disturbance of the molecules invisible to the eye. It is well known that the haloid salts of silver in emulsion after exposure to light are readily acted on by certain substances having great affinity for oxygen—especially when combined with an alkali—as pyrogallol, hydrokinone, &c. ; these precipitate the silver. It follows that any of these reducing agents, or so-called developers, act chemically most on the parts affected by strong light, and reduction of bromide of silver to the metallic state will be visible in the gelatine film. This semi-metallic or darkened material is virtually the photographic image and the basis of a negative. To obtain the true value of this impact of light, it is necessary to use judgment in developing. Take an ordinary pyrogallic formula :—

Pyro	...	...	...	...	...	2 grains
Am. bro.	...	...	...	...	...	½ ,,
Liquid am. (fort.)			...	...	...	1 drop
Water	...	...	...	...	to	1 ounce

I don't wish to be very elementary, but we know that pyro is the active principle, ammonia the accelerator, and the bromide of ammonia or potash acts as a retarder. When these chemicals are in contact with exposed film an action is set up, first attacking the surface particles and sinking or permeating the gelatine deeper until the limit of light-acted on material is reached, as represented in diagram fig. 2—No. 1, outline of latent image. With an

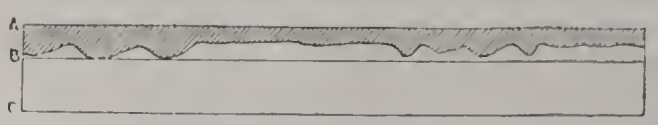
SECTION OF PLATE.

Fig. 1.



A.—Invisible or latent image. B.—Film unaltered. C.—Glass.

Fig. 2.



A.—Developed Image. B.—Film unaltered. C.—Glass.

accurately timed exposure and normal developer a well contrasted negative is generally produced, and after fixation in hyposulphite of soda solution there should be found a perfect image ; but a negative is not always a transcript of nature, and we ask how that is the case. Take this specimen. Thin image, no contrast, want of vigour, flat, won't make a print worth looking at. There are several reasons. First, under-development ; we remove the plate out of the dish, thinking it is sufficiently dense, and find after fixing there is scarcely any image. The developer has not penetrated to the deeper stratum of bromide affected by light. Secondly, over-exposure with the same developer will give a flat monotonous result, as the whole plate is overdone ; equally again, when under-exposed, a poor black and white hard negative, no half-tone or gradation ; a chemically fogged plate—the result sometimes of prolonged action—also staining by the yellow discolouration of pyro, which affects the film even when unexposed to light. I consider that gelatine itself, as regards hardness or impermeability, has an influence on the development. When excessively dry it obstructs the chemical action. Possibly this may account for the variable times requisite to develop some makes of plates. I have noticed old long-kept plates are more tedious. Occasionally there is a want of sharpness in detail not attributable to defective lens or error of focussing ; this may be ascribed to using a developer which is too energetic. In the collodion process, when the reducing agent was abnormally active, the particles of silver which built up the image were thrown into confusion, so to speak, and not accurately deposited on the lines laid by impact of light, hence a fuzziness. Although the wet process is not quite identical with gelatino-bromide, it suggests the desirability of gradual development.

As regards the colour of negatives, no one prefers a deep yellow stain, even if the image is well defined on account of slow printing. In using pyro or hydrochinone we generally get some yellowness ; when too pronounced it can be cleared by citric acid alum solution. If a negative is a trifle thin, a little stain helps the shadows or clear glass. It is, moreover, reasonable to look upon the colouring matter present in solution and attracted to those parts requiring density as a positive advantage. Intensification of negatives rarely gives a result equal to a properly exposed and developed plate. The reduction of thick unprintable negatives is comparatively easy, but needs care. The conversion of silver or silver oxide into a chloride or iodide, and then dissolving out with hyposulphite, will reduce the thickest negative. By experience the photographer learns by sight the appearances which indicate a good negative, and also when dealing with uncertain degrees of exposure he modifies the developer ; no one would wilfully apply a very strong developer upon a plate which might be much over-exposed, knowing that the film would be hopelessly fogged. He begins cautiously with little alkali, or less pyro or more restrainer. I cannot leave the subject of negatives without allusion to the use of isochromatic plates and yellow screen, although we are promised a paper by Professor Arnold on this topic later on. It has been recognised for some time that reflection from objects coloured red or yellow fail to impress the sensitive salts to the same extent as bodies coloured green, violet, or blue ; consequently, when developed, the true values of those colours are not brought out properly. I apprehend the rationale of erythrosin and other dyes of eosin series, as also chlorophyll and certain pigments including use of a yellow screen, subdue—or, rather, bring down—the less actinic rays to the level of those more active, and on this assumption I should imagine that a blue screen might convert the yellow to a green, and lessen the time of exposure.

The want of perfect truthfulness, as regards accurate light and shade gradations, is due, I am convinced, to the cause mentioned ; for any subject in monochrome, a neutral tint, and well-lighted, is sure to be faithful, the exposure being correct. When taking a portrait, with the countenance freckled or red patches present, a disparity of gradation is at once noticed, supposing puff, powder, or other white substance, is not used on the face before exposure ; but a negative can be made good by the retoucher's pencil ; and, speaking of retouching, which, with most amateurs is rather a weak point, how often our best negatives want just a little? All the pinhole scratches, thin shadows, and many defects, require the useful, but much abused, artist's work.

The rapidity of sensitive films, in respect to negative-making, affords a wide field for discussion. I used to take

instantaneous, medium, and slow, but find it safer to work one class, at least, in a day's excursion; and to adhere to one maker is a wise course. The very rapid are not generally adapted for landscape, unless used with drop shutter or short exposure, but for interiors I believe in them.

In concluding these fragmentary notes, in which the artistic or pictorial aspect of negatives has been purposely omitted as too extensive, I would merely say that a good negative will always produce a good print by any process. It can be reduced or enlarged without perceptible loss, and, if the negative is kept dry and properly varnished, may last for many years. Therefore the acquisition of a first-class negative as a means to an end cannot be over-rated, and the considerations involved in its production are equally interesting as any other branch of photography.

Notices of Books.

Helios, published twice a month. No. 3, June 1st, 1890. (*J. Theunis, Antwerp*).

This is a new Belgian photographic periodical. It contains photographic news of a varied description, and commits itself to no programme or leading article expressing editorial opinions. Among other things it states that the Liège Section of the Belgian Association of Photographers has fitted up an electric lantern for the projection of pictures on photographic slides, at its meetings, and illuminating a disc six metres in diameter. More than two thousand persons responded to the invitation of the Section to be present the first time it was used in public. The same journal states that M. Ch. Puttemans, Professor of Chemistry, is now giving a course of educational lectures on "Photography" at the Industrial School, Palais du Midi, Brussels. The production of ceramic photographs is one of the items on which instruction, with experimental illustrations, will be given.

Dr. Wallraff writes to *Hélios*, asking what would be the good of taking negatives in natural colours if the said colours could not be reproduced as positives upon paper. "If," he says, "I had the odd (*baroque*) idea of preserving the features of my mother-in-law, and that my lens did not refuse to yield to this extravagance, it would not be sufficient that the negative plate should be kind enough to let posterity know that she has a greenish complexion, black teeth, a red nose, and hair the colour of the coat of a she-ass; it is necessary that the positive print should be equally benevolent. We may, therefore, definitely relegate the problem of photography in colours to the same category as those of the philosopher's stone, the squaring of the circle, and perpetual motion."

It may be explained to Dr. Walraff that the photographs in natural colours on silver plates, as produced by Becquerel and others, are positives when first taken in the camera. It is to be hoped that his mother-in-law will see his letter and give him his deserts.

Agenda du Chimiste. (*Hachette and Co., Paris*, 1890).

This work, which, in the course of years, has undergone several editions, bringing all parts of it down to the latest date, is edited by M. G. Salet, of the Paris Faculty of Sciences, M. Ch. Gèrard, Director of the Municipal Laboratory at Paris, and M. A. Pabst, Principal Chemist to the Municipal Laboratory at Paris. Its value to photographers is that it is full of tables of figures and highly condensed valuable practical information—and nothing else—likely to be of use for reference to those engaged in practical and experimental work and research; there is no "padding" or wasted space in the whole book. The first edition of the little book was published in 1877, by M. Ad. Wurtz, whose dictionary of chemistry is, in France, equivalent to what that of Watts' is in England, and Gmelin's in Germany. In 1878 and 1886, subsequent editions were brought out by M. G. Salet. M. Wurtz first compiled it for the use of his students, and perhaps to save himself the trouble of continually giving them the information; they found it of such value that they had to consult it daily in their experimental work. From these facts it will be seen that it is a standard book.

The *Agenda du Chimiste* has a small portion of its space specially devoted to photography, and other portions, as in the case of tables of solubilities, and so on, are indirectly related thereto.

The following are some of the tables given in the book:—

Corresponding Quantities of Various Silver Compounds used in Photography.

Silver.	Nitrate.	Chloride.	Bromide.	Iodide.
1	1·574	1·328	1·741	2·176
0·6353	1	0·844	1·106	1·382
0·7523	1·184	1	1·310	1·638
0·5744	0·904	0·763	1	1·250
0·4595	0·723	0·610	0·800	1

Corresponding Quantities of Various Gold Salts used in Photography.

Gold.	Neutral Chloride.	Chloride of Gold and Potassium.	Chloride of Gold and Sodium.
1	1·542	2·1048	2·0229
0·6485	1	1·3645	1·3119
0·4751	0·7326	1	0·9611
0·4943	0·7623	1·0405	1

Corresponding Quantities of Various Bromides used in Photography.

Bromine.	Ammonium Bromide.	Potassium Bromide.	Sodium Bromide.	Crys. Cadmium Bromide ($4Aq$).	Zinc Bromide.
1	1·225	1·488	1·287	2·150	1·406
0·816	1	1·214	1·055	1·754	1·147
0·672	0·823	1	0·865	1·445	0·945
0·777	0·952	1·156	1	1·671	1·092
0·465	0·570	0·692	0·599	1	0·654
0·711	0·871	1·058	0·915	0·529	1

Corresponding Quantities of Various Iodides used in Photography.

Iodine.	Ammonium Iodide.	Potassium Iodide.	Sodium Iodide.	Cadmium Iodide.	Zinc Iodide.
1	1·142	1·307	1·181	1·441	1·255
0·876	1	1·145	1·035	1·262	1·099
0·765	0·874	1	0·903	1·102	0·960
0·847	0·967	1·107	1	1·220	0·063
0·694	0·793	0·907	0·820	1	0·871
0·797	0·910	1·042	0·941	1·148	1

The work gives information about the reduction of silver residues of various descriptions; also about the analysis of silver baths, and contains an exposure table by M. Derval.

FOUR FADED PHOTOGRAPHS.

"ONLY a woman's hair," once upon a time Swift wrote upon a well-known, an historic little parcel; and critics yet differ and contest in gentle periods whether the great satirist wrote it in pathos or in irony, in sorrow or in scorn. Only a woman's hair, when there is so much of that material in the world of nature! Only four faded photographs, when there are so many of them in the world of art; so many sick with that sallow complexion which indicates incurable disease and approaching dissolution. But as that hair had its value worthy of a distinctive label, so also have these photographs. In the first place, they are enclosed in what was originally such a dainty cover, a skin, as it were, of the colour and softness of cream. Then the delicacy of their make was so largely insisted on; each separate limb and member had its own peculiar praise. Next was recorded their faithfulness, which would "assist the student of art to train both eye and hand to an accurate fidelity, essential to the purity and force of the ideal creations of genius." This sentence is not that of the present writer; he is unable to weave such splendid patterns of rhetoric; he has, indeed, it may be whispered, but a poor and imperfect conception of what it means. But it has been copied literally out of the preface of the volume containing the four photographs, and surely signifies something great and splendid, for of the mountain in labour it is unnatural to expect the birth of a mouse. Then again these four photographs were to be the harbingers, the forerunners, the ancestors of others as fair, or even fairer than themselves. Suggestions were asked from the world at large to secure this end, to enable the proprietors to add to the usefulness and attractiveness of the pictures which were to follow. But no suggestions came, or if they came, they never appeared. No more photographs followed these first four. Therefore are they perhaps more distinctly precious.

Alas! Their pure creamy cover is now defiled with dirt, a laceration through the centre has been patched up with a bit of common blue paper. The four photographs, each with its allotted sheet of tissue to preserve it in its pristine beauty, are all bleached and faded; the fine detail which it is charitable to suppose once delighted the eyes of their beholders has disappeared, and on the first and last number—the Alpha and the Omega—has been written by the authorities of the British Museum Library—the sole copy, in all probability, which this heedless and careless world of ours contains—the fatal word "Discontinued," which, being translated into the language of our own mortality, is "Dead."

And now rising before us, like pale ghosts, our four photographs seem to plead for some little notice, before they disappear for ever, to plead with such mute eloquence of entreaty as a tender-hearted man may with difficulty withstand. But a little while longer and they will be gone as we shall be. Surely he who chanced upon that little packet with its sad inscription, "Only a woman's hair," and gazed upon what it contained, hesitated a little space before he gave it up to destruction. He might bury it in the earth, or, if approving of cremation, he might burn it, but in any case he would treat it reverently, and not scatter it on the floor to be swept away into the common heap by the housemaid's broom. Our four faded photographs demand a like reverence of treatment. We will touch them tenderly and with care, will give them that sort of posthumous immortality which men seek for in brass and marble, before we return them to their long sleep, not probably soon again to be disturbed, in darkness and in dust.

About two score years ago, an elegant but thin volume was published at, we will say, Little Orpington, called "Photographic Illustrations." Its contributors were members of a Photographic Society—the Little Orpington Photographic Society—and its preface stated the object with which the publication was then "brought forward." This preface is chiefly conspicuous for a dignified modesty. "It is not," says the mouthpiece of the members of the Little Orpington Society, "that we suppose ourselves to have achieved results surpassing those already attained by many artists, nor that we desire to step forward as teachers of the detail of photographic manipulation; but we wish to test the use of photography as a help to education in its highest and widest forms, and at the same time to bring forward the relation in which this nascent art stands to the work of the poetic artist." It was an idle hope, a fruitless aspiration; the result of the test was adverse. "Education in its highest and widest forms" would have none of it, and the relation between photography and "the work of the poetic artist" is in this one number by no means clearly defined.

Illustrations also were promised in the preface of "objects interesting either in themselves or in their associations," and these objects were arranged in five classes: History, Antiquities, Art, Natural Objects, Mechanics. These classes seem to rebel somewhat against the rules of logical division, inasmuch, for instance, as the illustrations under history might be placed under antiquities, and both of them again under art. The pictures, however, in this first and only number, the four faded photographs, are, or, we should rather say, were, representations of an East view of Bramhall Hall, a West view of Bramhall Hall, Dr. Arnold, of Rugby, and a Steam Hammer. The steam hammer, which is placed, not perhaps inadvertently, in close succession to Dr. Arnold of Rugby, could only come under mechanics, but the particular classes of Dr. Arnold of Rugby, and of Bramhall Hall, east and west views, are not so easily determined. The latter, we are told by some letter-press, has been held by "the family" for nearly four centuries. The picture would therefore, perhaps, be rightly classed under antiquities. Copious quotations from Ormerod's "Cheshire" give details about the arms, and rooms, and fortunes of the house which, however interesting to "the family," affect the photographer very lightly, if at all. That artist is probably altogether careless of the detailed fact that their "arms were argent, a chevron sable between three cross crosslets fitche of the second and crest on a wreath, a felon's head couped *haltered or*." More interesting than these matters, which may have contributed in some measure to the sudden and untimely decease of the Photographic Illustrations, is a subjoined so-called photographic memorandum, giving the date and the time of day on which the photographs were taken. The conditions for the taking of Bramhall Hall were not unfavourable. It was a sunny summer noon, under a blue sky flecked with floating white clouds. The lens used was a single one of $2\frac{1}{2}$ inches diameter, the focal length from the back surface was $12\frac{3}{4}$ inches, and the diaphragm $\frac{1}{2}$ an inch. The negative was taken by a modification of Le Gray's waxed paper process, and the exposure was six minutes in the camera and $1\frac{3}{4}$ hours in development.

Unless we rank the photograph of Dr. Arnold of Rugby

under the head of art, a division under which all respectable photographs might be included, we must place it under that of natural objects, fencing it off thereby—though by a somewhat strange party-wall—from Bramhall and the Steam Hammer, neither of which certainly can be regarded as an object of nature. The letter-press accompanying Dr. Arnold of Rugby's photograph gives the leading events in the life of this excellent man, as laboriously culled from the newspapers and books of reference of the time, informing the reader that he wrote at Lalcham several papers on Roman History for the Encyclopædia Metropolitana, and that he traced the eternal truths of Divine Providence in their varying application to the different states of society. His photograph was taken from a bust on a dull, frosty day in mid-autumn, by a doublet lens of 2½ inches diameter, with 9 inches focal length from the back lens, and a diaphragm of ½ an inch. The negative was a collodion one, developed slowly with pyrogallic acid—

Distilled water	...	...	1 gr. to 1 oz.
Glacial acetic acid	...	...	20 min.

Exposure two minutes.

The Steam Hammer gives occasion for a diatribe on hammers generally from the earliest periods. Its negative—collodion—was developed with protonitrate of iron, then intensified with bichloride of mercury and iodide of potassium. It is the most distinct of the four pictures; but the subject appears somewhat infelicitously selected for a "nascent" number of a photographic journal. "J. Nasmyth & Co., Engineers, Manchester," is still distinctly visible on the right of the machine, and "J. Nasmyth's Patent," is equally clear on the left. Two figures are introduced, perhaps three, but it is difficult to speak with certainty, as the third may well be intended for a wheel: and with this the photographic illustrations conclude. A similar venture, if conducted on widely different lines, might at the present day be a success.

But this venture of forty years ago was a failure. Whether it was that the "descriptive essay" which we have ventured to call letter-press, embodying, in the opinion of the writer of the preface, "the principal facts which require to be known in connection with the illustrations as briefly as possible," was a trifle too long for the public patience, or whether the "facts which require to be known" failed to impress the reader as altogether necessary, or even material, will now probably never be discovered. It may be that the reader, anxious for promised "aid in the great work of mutual education, by giving strictly faithful representations of objects which could not otherwise be laid before him," was of opinion that Dr. Arnold of Rugby was not such an object, or supposing that he was, that his portrait might have been laid before him otherwise. In any case, our four faded photographs are the only pictures to be seen in the fancy-built gallery of the members of the Photographic Society of Little Orpington, and none, it may be affirmed with certainty, will resort to any process for the purpose of reproducing them.

Photographers' Benevolent Association.—A meeting of the committee was held on June 6th at Great James Street, Bedford Road, Mr. W. Benham chairman. The grants were made, and one new member elected. Any firm desirous of assisting the Association can have copies of rules on application to the hon. sec., H. J. Beasley, 65, Chancery Lane, W.C.

Patent Intelligence.

Applications for Letters Patent.

8,558. W. H. Coulson, 33, Chancery Lane, London, "Metallic Frames for Glass Roofs."—June 3rd.

8,647. J. C. Shenstone, 70, Chancery Lane, London, "Focussing Arrangement for Cameras."—June 4th.

8,724. G. V. Fosbery, 46, Southampton Buildings, London, "Developing Room Illumination."—June 5th.

8,822. W. G. Thomson and W. Ward, 8, Quality Court, London, "Roller Holders for Photography."—June 7th.

Specifications Published.

10,131. *June 21st*, 1889.—"Taking Photographs in Rapid Series." William Friese Greene, Photographer, 92, Piccadilly, London, and Mortimer Evans, Civil Engineer, of Savile Club, Piccadilly.

The invention has for its object the formation of photographic pictures, and relates chiefly to the production of such pictures as are necessary to illustrate and register the movements of animals, insects, or moving objects, either taken singly or in masses, as may be desired.

For this purpose they construct an apparatus by which, with a single camera and lens, a rapid series of such pictures may be taken, and by which a series of fresh photographic sensitive films or portions of such photographic film may be substituted for those which have been exposed to the action of light with sufficient rapidity for the desired end.

This camera has already been fully described in the Photographic News. The inventors make fourteen claims.

9,869. *June 15th*, 1889.—"Instantaneous Shutters for Cameras." A communication from George Eastman, of Rochester, County Monroe, State of New York. Alfred Julius Boult, 323, High Holborn, London.

In carrying out this invention I provide a pivotted plate or shutter having a segmental slot preferably considerably longer than the lens opening. The edges of the shutter may be turned up or provided with stops, and pivotted at the same point as the shutter is a cover narrower than the shutter, having no slot, and also having one side turned up, and provided with one or more stops. This cover is so controlled by a spring or springs as to have a tendency always to lie at one side of the shutter, and when in this position is entirely clear of the slot in the shutter and the lens. The shutter is also spring controlled with a tendency in the direction opposite to that of the cover. In its normal position the shutter lies so that the slot is entirely past the lens opening, and a part of the solid portion of the shutter, as well as the cover, both lie behind the lens so that no light passes. In setting the shutter prior to making an exposure the shutter is pulled over to its furthest limit on one side by any suitable means, such as a lever or a cord provided with an external button, and secured around a pulley on the shutter spindle; this pulley being so arranged as to carry the shutter with it in one direction, but to leave it free in the other direction. The shutter is provided with two or more peripheral openings into which falls the end of a spring controlled or spring lever pivotted; the cover also is provided with one or more slots.

The action is as follows:—

When the shutter is drawn over by the cord the cover remains behind the lens, being retained in that position by the spring lever until the opening in the shutter has passed the lens, when a suitable projection upon the periphery of the shutter, or special peripheral formation, causes the spring lever to rise out of the cover which then, under the influence of its spring, passes over to the side of the shutter out of the way of the slot in the shutter. The shutter is held in its set position by the spring lever entering a slot, suitably arranged for the purpose, and to make the exposure a press button or equivalent on the outside of the case may be pushed in against the reversed end of the spring lever, with the result that the acting end of the lever is removed from the slot in the shutter, which then, under the influence of a spring, flies over, making an exposure for the length of time during which the slot passes the lens opening,

the shutter finally resting in the original position, when both shutter and cover are behind the lens.

The cover is arranged with a peripheral slot or projection which takes on to the spring lever, so as to raise it clear of the portion of the shutter necessary to allow the slot to pass, the lens opening during the setting of the shutter, after which, as already explained, the lever is raised by the shutter itself, and the cover flies clear.

By this means it will be seen that there is no occasion for capping the lens during the setting of the shutter, as the previously described cover prevents the passage of light through the lens during the setting of the shutter.

This shutter may of course be arranged in front of the lens, or behind the lens, or, in the case of double lenses, between the two, according to requirements.

By providing suitable peripheral slots, both shutter and cover may be held by a spring lever in a position to leave the uncovered slot in the shutter opposite the lens opening, so that a prolonged exposure may thus be made.

Correspondence.

PAINTERS AS JUDGES OF PHOTOGRAPHS.

SIR,—Perhaps you will allow me to make a few observations on your article of May 30th on the above subject, as I fear it will not receive the unanimous approval of those who are endeavouring to regard photography as something more than a mere imitative process. I should have asked you to grant me this favour last week, only I was in hopes that a more able pen than mine would have dealt with the matter. If photographs can possess any artistic merit—and that this is possible cannot be denied—then surely those merits can better be guaged by persons who have been trained in art. You controvert this opinion by saying that photography cannot, or should not, attempt to imitate painting, and because the qualities which make a good painting or drawing do not necessarily make a good photograph, and you quote in support of this the well-known canon of art that "a worker dealing with a particular material shall not hide its identity and attempt to make it imitate something else," and tell us with perfect accuracy that a water-colour drawing should not imitate an oil painting, or an oil painting a water-colour. But a painter in oils may legitimately endeavour to give the softness of water-colour, or a water-colourist the boldness of oils, without laying themselves open to the charge of imitation. So, too, in the case of etching: an etcher does not and cannot attempt to make his works resemble paintings in monochrome, but that is no reason why he should not strive to give painter-like qualities to his etchings. In fact, "the object of the Society—Painter Etchers—is not merely the restoration of original etching, but the re-infusion into all forms of the engraver's art of the painter-like qualities it has lost" (*Vide* Exhibition Catalogue.) These etchers do not rest satisfied with drawing their subject on the plate and then sending it away to be bitten, and the prints pulled from it in a mechanical manner. On the contrary, in order to obtain painter-like qualities, they resort to what would be called in photography dodges of manipulation, or, as you would say, "juggling" with the plate. In fact, the man who does the biting and the pulling must himself be an artist, and know how to make the best use of the materials and apparatus with which he is working. Why should not the same latitude be allowed to photography? A lens used in a particular way will give microscopic definition; if used differently it will subdue definition. Both these properties are at the service of the photographer, and it is not "juggling" with a lens to make use of them. Etching is also capable of giving the finest definition, but that is no reason why it should always be shown, whether suitable to the subject or not.

In the case you mention of a certain photograph attracting the eye of an artist, it appears to me that the award was correctly given, not because it was more like a painting than other photographs, but because it was more like a picture, and the art of photography does not lose its identity by producing pictures.

But then comes the disappointed exhibitor who complains that a medal has been awarded to a photograph which is technically bad, because it shows errors in focussing, exposure, and development. That is not so; the focussing, exposure, and development are correct *for the result aimed at;* and here comes in the art to assist the science. You seem to imply that a photograph which possesses painter-like qualities may be compared to a piece of grained wood. This is not so, for the latter is solely an imitation, and the former is not. You might fairly compare a photographic copy of an engraving with a piece of grained wood, because this is essentially an imitation, and does not pretend to be anything else. But an artistically treated photograph of a natural scene, although it may have (and must have if photography is to be carried to its highest limits) painter-like qualities, does not and cannot attempt to *imitate* a painting. To obtain the best results the science of photography must be the servant of the art. The art teaches us what we should strive for, and the science how to obtain it. Therefore, in judging a photographic exhibition, the knowledge, training, and taste of an artist should be supreme, and the scientist should not be allowed to intrude his technicalities into a realm the nature of which (*qua* scientist) he is wholly ignorant. You have written strongly against artists judging photographs, but I am glad to see that at the conclusion of your article you have written still more strongly against photographers doing so. If it should ever again be my fortune to gain a medal, I hope and pray that it may not be at the hands of a man who holds that "Turner's pictures are outrageously out of focus, and who would suggest that the artist would do well to insert in the picture the details which were lacking." WILSON NOBLE.

52, *Sloane Street, S.W., June 7th,* 1890.

P.S.—I am glad to see that Mr. George Davison has commenced a series of articles on "Photographic Exhibitions." I trust his able pen will deal with the question of artists or photographers as judges.

THE PHOTOGRAPHIC CONVENTION.

SIR,—Allow me, through your columns, to announce that the proceedings of the forthcoming meeting at Chester will be opened by the Mayor of Chester at a *conversazione* to be held at the Town Hall on the evening of the 23rd inst.

Permission has been given to photograph the following places at any time during Convention week upon the production of a membership ticket:—Conway Castle (interor and exterior), by invitation of the President and Council of the Royal Cambrian Academy of Art; Chester Cathedral and precints, by the Dean; St. John's Church and ruins, by the Rev. S. Cooper Scott; Interior and Exterior of Eaton Hall and Park, by the Duke of Westminster; Hawarden Castle and Park, by Mr. W. H. Gladstone.

Excursions have been arranged during the week to Conway Valley, Bettwsycoed, Hawarden, Eaton Hall, Vale of Llangollen, Royal Mersey Yacht Regatta, and Old Moreton Hall.

At the evening meetings papers will be read as follows:—"The Records of Photo-micrography," Mr. A. Pringle; "Imagining and Imaging," Mr. P. H. Newman; "Orthochromatic Photography with Rhodamin," Mr. C. H. Bothamley; "Photography in Norway," Mr. Paul Lange; "Astronomical Photography," Mr. A. A. Common; "A Magazine Camera and Lantern," Mr. Friese Greene. Reports also will be received from the Lens Standard Committee, and the Weights, Measures, and Formulæ Committee.

A fully detailed programme will be forwarded on application.

J. J. BRIGINSHAW, Hon. Secretary.

128, *Southwark Street, London, June 10th.*

PHOTOGRAPHS OF THE TOWER OF LONDON.

SIR,—In reference to the remarks made in your last two issues in respect to not seeing any photographs of the Tower for sale, and of the inscriptions in the Beauchamp Tower in particular, I beg to state that I have spent an immense amount of time in photographing inscriptions and other things in all

parts of the Tower, which to me and a few others are very interesting. For years past I have given up publishing photographic prints, as I have a great horror of the Bankruptcy Court. I went into publishing, to supply the middleman, who is seldom or ever satisfied at whatever price they are offered to him, and then it is mostly "sale or return" business. I need not say the return means when the prints are in such a damaged condition as to be unfit for sale, which again means ruination to the producer. I have seen 12 by 10 prints sold to the shopkeepers for a few pence each, and other sizes in proportion. I have some two hundred negatives of the Tower alone, but in the present state of the market, publication is entirely out of the question. I am still continuing my series for private circulation only, also photographs of many other buildings of historical interest. The way this state of things has been brought about is that a few capitalists have put many thousands of prints into their trade, flooding the market with trash, at about five per cent. above the cost of production, and a little man who endeavours to make an art of photography, if he attempts publication, goes to the wall. I myself have been told by the shopkeepers it is not a matter of quality so long as they are cheap, because Mr. So-and-so's pictures, which are supplied to them at half the price, sell just as well. So what inducement is there for any worker to make a venture?

Reigate, June 7th, 1890. WM. BROOKS.

Proceedings of Societies.

Photographic Society of Great Britain.

The ordinary monthly meeting of this Society took place on Tuesday evening, the 10th inst. Mr. J. Glaisher, F.R.S., president, occupied the chair.

A paper was read by Mr. W. E. Debenham on "Estimating the Efficiency of Plate Backings," illustrated by a diagram and by photographs of the reflected images from various backing agents. A series of such backings, too, was shown coated on one side of a prism, and they could thus be examined, and the light reflected from them compared by simple inspection. Such inspection would show certain substances to reflect much light, and the sesubstances could, therefore, be rejected; whilst others that promised better could be compared by photographing the images reflected from them. The first plate shown had received twelve exposures on different parts, one when using a prism unbacked, and the other eleven taken with various backings applied to the prism. In some cases no images, and in others only very faint ones, had been given in the photograph, and the substances that thus appeared to answer the best were again used on the prism with longer exposures. One substance that he found very effective was caramel or burnt sugar, used in combination with an equal weight of gelatine or gum arabic. One plate which had received three exposures—one of fifteen seconds to the uncoated prism, one of one hour to the prism coated with bitumen, and one also of one hour to a backing composed of gum caramel and China ink—showed images of the first two to be about equal; the bitumen image receiving about 240 times the exposure of the unbacked one; whilst the gum and caramel showed still less image. He was not aware that the use of caramel as a plate-backing agent had been tried before; it was certainly very effective. Another plate had received six exposures through a hole of about the $\frac{1}{40}$ of an inch diameter. These exposures had been of fifteen seconds, one minute, four minutes, and sixteen minutes on the unbacked portion, and of sixteen minutes on the backed part. The latter showed no reflections, whilst the former, even that with fifteen seconds or $\frac{1}{64}$ of the exposure, showed the ring of halation characteristic of total internal reflection.

Mr. J. Spiller said that amongst the many substances that might be thought available for plate backing, the aniline dyes could not practically be included, as they would cause stain or action upon the film if they crept on to it, as they would be sure to do. Aniline orange would dye the film, and he knew of no chemical agent capable of remaiuing the staiu. It was a troublesome job to have to remove a backing of bitumen, and he was glad to hear of a soluble substance like caramel that was so effective.

Mr. H. Chapman Jones thought the experiments shown very interesting and valuable, but that backing plates was a step that ought not to be required. They wanted to use in the film itself all the energy of the light striking upon it, not to let any be lost, then have to be absorbed by a backing. Plates were now manufactured on a commercial scale which did not require any backing. Photographs of such a scene as one containing dark trees and light clouds showed no halation with such plates. For dark interiors with bright windows backing might be required, but he would prefer to alter the conditions of the subject itself.

Mr. W. Bedford said that plates which did not show halation owing to thickness of the film owed their freedom from this defect not to the light being entirely stopped in the film, but that development did not with such thick coatings proceed quite to the back of the plate, where the light from the back surface of the glass was reflected.

Mr. T. Samuels recommended the use of collodion stained with a dye in preference to other modes of backing; but backing he considered necessary.

Mr. Debenham, in replying, said that he thought plate makers might be induced to supply backed plates. A backing might be used either of gelatine and caramel—the gelatiue of such a kind as to frill off quickly in development—or of gum and caramel, with perhaps black pigment also.

Mr. H. Chapman Jones read a paper entitled "The Staining and Clearing of Gelatine Films." He showed a great many results of experiments made upon gelatine plates; some, after the removal of the silver compound by immersion in a solution of hyposulphite of soda, but most of them upon the film coutaining gelatino-bromide of silver. The result of his experiments was to show that the substances recommended as clearing agents did not possess the action claimed for them, but that what clearing appeared to be effected was really due to the extra washing received, and that simple water would do all that any clearing would, whilst some of these agents retarded or positively prevented the clearing action which water alone would have exercised. A mixture that had been recommended of alum, citric acid, and ferrous sulphate, he had found to make a stain already existing still more pronounced. One set of experiments showed eikonogen as the only agent not producing stain, whilst with pyro there was a slight stain, and with hydrokinone a more marked discolouration, which, moreover, was not even, but accentuated at the edge at which the solution had been arrested.

Mr. T. Sebastian Davis wished to know whether Mr. Chapman Jones had made comparative experiments with distilled water as against ordinary water for the removal of stains.

Mr. Chapman Jones had not done this.

Mr. Arnold Spiller could not agree with the author of the paper. He remarked especially that he had found the mixture of ferrous sulphate alone and citric acid to be particularly useful in removing yellow discolouration. Citric acid solution, also dilute hydrochloric acid, he had used and found to be effective.

Mr. A. Mackie noted that ferrous sulphate had an intensifying effect, which subsequent applicatiou of an acid removed.

Mr. Arnold Spiller explained this intensifying action by the fact that pyro oxidised in development and combined with the gelatine. The application of ferrous sulphate then formed a compound resembling the black in writing ink.

Mr. Chapman Jones defended his conclusions by pointing to his experiments, to which he had been led by direct observation. Alum he had always found to be positively detrimental. The fixing bath that he used was hypo, to which some carbonate of soda was added, and he never used the solution twice.

A paper by Sir H. Trueman Wood on "Photographing the Induction Spark" was taken as read.

It was announced that the annual soirée iu connection with the society's exhibition would be held on September 27th, and that pictures for the exhibition must be sent in by the 15th of that month.

Mr. J. B. Stacey was elected a member of the Society.

THE LEWES PHOTOGRAPHIC SOCIETY.

MONTHLY meetiug June 6th. The prints sent iu to the quarterly competition were on view. Mr. N. S. Starnes acted as judge, and attended the uneeting specially to explain the merits and demerits of the various prints submitted to him. The certificates in classes 1 and 2 were both awarded to Mr. G. J. Wightman, who then recounted his "Twelve Months' Experience as an Amateur Photographer," in an interesting manner. In the course of his remarks he said he owed his success to the Society, and he advised all who wanted a healthy and instructive hobby to take up photography.

THE SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE monthly meetiug was held at the Masonic Hall ou Tuesday eveuing, June 3rd, Mr. B. J. TAYLOR in the chair.

The SECRETARY announced that he had an invitatiou for the Society to send a delegate to the Photographic Convention of the United Kingdom, to be held from the 23rd to 28th inst., at Chester. He then put upon the table samples of Wormald's lantern slide masks of various shapes aud tints, when several boxes were ordered, to be given to those members who had promised to present slides to the Society, so as to have them all somewhat uniform.

Mr. T. G. HIBBERT gave a practical demonstration of the Kallitype printing process. The specimeus he showed were Payne's grey in colour. The process, he said, was claimed to be permanent, and required no hot baths, calcium tubes, or rubber bands; Kallitype, he continued, being much more sensitive than ordinary silver paper, care is required in printing to fill the frames in a yellow light or weak daylight, also not to examine them out of doors, as with ordiuary sensitive paper. He found it to print in about one third the time required by silver paper. Having some printed, he then proceeded to develop the same, somewhat after the platinotype method, after which a general discussion followed, and it was agreed that as yet it was not superior, if equal, to the platinotype process, but would, no doubt, be considerably improved.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 5th inst., Mr. W. COLES occupied the chair.

Mr. H. M. HASTINGS exhibited negatives taken at Uxbridge with a hand-camera.

Mr. J. B. B. WELLINGTON, who had just returned from a tour on the Continent, said that his photographic luggage had passed through eleven custom-houses, but he had experienced no difficulty whatever with the authorities.

The results of the competition Pyro *v.* Eikonogen were passed round and adjudged; Mr. H. M. Hastings being the champion of eikonogeu, Mr. C. H. Cooke usiug pyro. The conditions of the contest were, that five exposed plates should be given by Mr. A Cowan to each competitor for developmeut, the exposures being unknown. Prints from each set of finished negatives were showu, each member present marking the print he considered the best. The result showed that in the cases of over-exposed prints from negatives, those developed with pyro were considered the best, but with under-exposures eikonogen obtained the most marks.

The subject for discussion for the evening was "The Priuting Process that best Registers the Gradation of the Negative."

Mr. R. P. DRAGE opened the discussion by reading a short paper advocating the superiority of silver prints in this respect over all other kinds of printing.

Mr. W. E. DEBENHAM was of the same opiniou. For range of gradation he considered albumen and gelatine gave excelleut results: platinotype did not give the saue amount of gradation.

The CHAIRMAN said that in selecting a printing process, it was necessary to consider the subject of the picture, whether general effect or minute detail was desired.

Mr. J. J. BRIGINSHAW said that for priuting from negatives of microscopic objects, he gave preference to gelatine for the reudering of all the fine details of the negative so uecessary for this class of work.

Mr. A. COWAN said that for printing from thin negatives the best gradation was obtained with albumenised paper.

The outing on Saturday next will be at Hale End; members to meet at Wood Street Statiou at 2.30.

Answers to Correspondents.

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

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

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

A. T.—*Donkin Relics.* A photograph of Dychtau, marked to show the spot of Messrs. Fox and Donkin's last bivouac, appeared in the *Pall Mall Budget* of 15th ult. In the ice cave on a rock ledge were found thermometers and other apparatus for determining the boiling point of water at high elevations, together with an iron stewpan, drinking eup, aud fine instruments packed in sock aud glove. There was no camera. Probably our friend had this with him strapped upon his shoulders, but the now useless revolver was found hanging on the rocks at an altitude of about 14,000 feet.

J. M. (Norwood)—*Nitrate of Soda for Wet Plate Bath.* We should not recommend you to add nitrate of soda to a collodion sensitisiug bath, because Dr. William Allen Miller proved many years ago that it diminished the sensitiveness. If you must put in something to retard the evaporation on the plate during warm weather, try the addition of a small dose of Price's purest glycerine, using as little as possible, or it may cause fog. If by chance you get in too much, sunning the bath and filtering is the best way of rectifying it.

W. V. MORRIS.—*Sizes for Stereo Camera and Plates.* Either the $7\frac{1}{2}$ by 5 camera, commonly used by amateurs with a pair of twiu lenses of about $4\frac{1}{2}$ inches focus, or one for plates $7\frac{1}{4}$ by $4\frac{1}{2}$ inches. The Holmescope is a good form of hand stereoscope, with large square lenses shaded by a hood, all other parts being left quite open.

F. R. A. S.—*Solar Eclipse of 17th instant.* We thank you for the information, and, for the benefit of our readers, make known the following particulars:—Iu the north of Africa and southern parts of Asia, the sun will present an annular eclipse, but at Greenwich it will, of course, be only partial; beginning on Tuesday next at 8.20 a.m.; maximum phase at 9.23, when about one-third or 0·37 of the sun's diameter will be obscured, and endiug at 10.30 a.m. With landscape camera and long focus lens provided with instantaneous shutter, good results, although small, ought to be obtained, these permitting of being afterwards enlarged. It would be advisable to back the plates with carbon tissue, aud possibly two or more exposures could be received upon the same plate, allowing time for the disc to travel clear. By watching the ground glass it could easily be ascertained previously what interval should be allowed to get the images well clear, and a few preliminary experiments would settle this point, and likewise the adjustment of the time shutter. Another direction of study should be the registration of the crescent-shaped spots of light under trees, always visible during the progress of an eclipse, and a further set of experiments might be made with a pinhole camera.

S. H. & Co.—*Spotted Prints.* One unmounted and five cabinets, all showing the same defects, which at first sight appear to owe their origin to bronze powder, magnesium, or other reducing particles, got iu amongst the photographs, but we are unable to discover any trace of these, even with a microscope. The fixing and washing have been very carefully performed, for there is no evidence of hypo, and your description indicates the best known method of working. Is it possible that a bad album with shaiu gold edges and margins is responsible for the mounted cabinets? Otherwise, the case remains, as you say, a "mystery."

H. F.—*The City Exhibition.* The specimens were noticed last week on page 433, and it was unnecessary to refer to them again iu this column.

J. E. D., A. W., received.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

NEXT Monday the Photographic Convention will meet in the ancient city of Chester, the most old-world looking place in this country, and one which will present plenty of subjects to the photographers who attend the gathering. A disadvantageous feature is that red sandstone has been so largely used in the construction of the more interesting buildings, and that that colour is not the best for plates which have not been made red-sensitive. Time was when Chester rose boldly from the plain, and, with its ancient walls and battlements, had an exceedingly picturesque appearance, but for many years past houses have been springing up close outside its walls, and somewhat dingy suburbs cover the space once occupied by green fields. On a fine day the Welsh mountains can sometimes be seen faint and grey in the distance from the city wall. The "rows" of Chester are unique; these consist of two rows of shops—one row above the other—upon one side of the street, so that, including both sides of the street, there are four rows of shops in all. While walking in front of the upper row of shops, the pedestrian treads a pavement laid above the ceiling of the lower row of shops; the second floor of the house is above his head, so that he is in a kind of arcade, but not one of any pretensions to architectural beauty. These "rows" form a protection from the glare of the summer's sun, also from rain and snow; but altogether, arcades in street architecture are not usually found to be desirable in places north of the Alps. One or two of the streets in Berne have arcades after Italian fashion. They are liked during the few months of summer, but the tradesmen who have shops therein say that the arcades make the said shops too dark and gloomy the greater part of the year.

Photographic excursions from Chester have been planned for nearly every day during the coming week, and the most attractive are those to Conway and Bettws-y-Coed, at the former of which places the more picturesque part of North Wales begins. Great Orme's Head is within moderate distance, and from it Puffin Island and the coast of Anglesea can be seen. Once we had a day of the Robinson Crusoe kind all alone upon Puffin Island, with not even a puffin for company, because some rats were wrecked on the island several years ago, and found puffins' eggs to agree with their constitution. The tide runs with great velocity between Puffin Island and Anglesea, and any lonely sojourner on the former for a day feels grateful that the fisherman does not forget to return to the island to take him back to Beaumaris. Some exceedingly pretty photographs of the Welsh hills are obtainable from the Anglesea side of the Menai Straits, because the hills are at a suitable distance, and have a good marine foreground. Towards evening the light is best, because at mid-day the sun would be behind the hills, facing the camera. The mountain Penmaenmawr is but two or three miles from Conway, and has a railway station at its base, so is available for those who wish to do some climbing. Conway Castle will, of course, be largely photographed again next week, as it has been largely photographed before. Near the mouth of the Conway was a pearl fishery once upon a time; the pearls were found in a coarse kind of mussel. As they will be under the guidance of a scientific man, the "conventionists" are likely to make some explorations in this direction, and to return home with their pockets full of mussel-shells. There is good sea-bathing near Great Orme's Head, and a lively species of small shark, from four to six feet long, at times frequents the region between Great Orme's Head and Puffin Island.

The excursion party for Bettws-y-Coed will plunge for a few miles into the hilly part of Wales, but will see nothing of the higher mountains of the Snowdon range, unless it goes several miles farther on, along the Capel Curig road, when Snowdon itself will come into view. About the finest view of Snowdon obtainable is still farther on, near the point where the Capel Curig road meets that from Llanberis to Beddgelert; this point is high up the side of the Vale of the Waters

—Nant Gwyuant. A great lake covers the bottom of the valley, and from the other side of the lake rises the most precipitous side of Snowdon, which can here be seen from base to summit. A little inn is near the junction of the roads already mentioned, and many years ago two wayfarers were imprisoned therein by rain for two days, with but two books in the house, namely, a Welsh Bible and "Thoughts on Suicide."

The people in Wales are usually hospitable and good-natured. We know those of the south better than those of the north, and this is the kind of talk one is liable to hear from Dafydd Rees about Evan Evans, who went to have his photograph taken: "Have you heard that Evan Evans went to John Jones to have his shaps (shapes) taken, and Morgan Griffiths says it was done bad, shockin' bad, iss (yes) indeed, to goodness."

A Pembrokeshire literary man of ability and a born Welshman once compiled the following sample of Welsh-English:—

O, had I the harp of King Dafydd,
What a lively lament I'd indite,
But the verse nowadays is so rabid,
I'm almost ashamed for to write.

Doubtless the Bettws-y-Coed party will bring back with them various specimens of the Welsh-English language of North Wales as applied to photographers and photography.

NEGATIVES FOR PHOTO-MECHANICAL WORK.

OF late years the employment of photographic processes for the purpose of illustration in periodicals and books has become so general that this kind of work has not only displaced, to a great extent, the art of the wood engraver, but it has called into being a number of publications which would never have seen the light had not this quick and convenient method of producing wood blocks presented itself. Photographs in half-tone can be converted into blocks ready for the printing press without difficulty, but their want of depth makes it difficult to obtain satisfactory prints from them unless they are impressed on fine paper and with very good ink. It is different with line blocks, as they are called—that is to say, blocks which have been produced photographically from drawings in pen and ink, and which consist wholly of line work.

There is some little art required in producing a negative from such a drawing, for its chief characteristic must be that the lines upon it shall be clear as glass, and that the background upon which they are traced shall be as opaque as possible. The negative must be reversed, but in these days of films which can be printed from either side this consideration should not present any difficulty. The hardest task before the worker has hitherto been to get the strong contrast between the lines and ground, to which we have just adverted, and this was, for a long time, deemed to be impossible to attain on a gelatine plate. So the custom among those who undertake this class of work has been to reverse their negatives by use of a surface-silvered mirror placed outside the lens, and to produce those negatives by the wet process.

Many photographers might, with reason, object to take up the old process. Some because they have never made pictures on wet plates—and this is, of course, true of a number of modern workers—and others because they have not sufficient space at command to keep the old and the new methods distinctly apart. The result of this is that the special form of negative required for photo-mechanical processes is regarded as something obtside the usual range of business, and the work is left to others to do.

But such considerations need no longer stand in the way, for it is now quite possible to obtain upon a gelatine plate a negative which shall rival in its contrasts of black and white that which is produced by the aid of the silver bath. We have lately experimented in this direction with two brands of plates, and have obtained most successful results, and we are informed on good authority that there is at least one other brand in the market which will answer equally well.

The first we tried were Mawson and Swan's photo-mechanical plates, which, as their name implies, are made for the purpose. The drawings which we copied were made in black ink upon a clay surface paper, which is a recognised material for work of this character, the mineral surface giving each line made by the pen a sharp outline instead of the ragged edge which lines will often exhibit if made on card of the ordinary kind. The plates are very slow in action—much slower than those produced by the wet process—and the exposure with a small stop ran up to two minutes or more. We at first tried for development a hydroquinone formula which we found advocated in print, but it was useless in our hands. It certainly gave an image which was intensely white and black, and at first we were pleased with its promising appearance; but unfortunately we found, subsequently, that the black was by no means of a non-actinic character, and that it let the light through to such an extent that the negatives had to be rejected.

We now commenced *de novo*, but this time we took good care to depend upon pyro for development. The change in the result was most marked, and there was the further advantage of increased speed of production. Density, we found, could be obtained to any extent, and in one case where an error had been made in exposure, and the film was not quite dark enough, it was brought up to the level of the others by a short immersion in a mercurial intensifying solution. In the after operation of printing we found that the dark portions of the negatives were so opaque that no light could pass through, and they were in every other respect as good as those produced by the wet process. The advantage of being able to bring up a negative to this pitch of density without having recourse to intensification, which is apt to clog the finer lines, and often brings disaster in its train in the shape of discolouration, is obvious.

The other brand of plates which we found suitable for this work was Edwards' isochromatic. We were employing one of these plates for copying an engraving simply because it happened to be at hand, and we

were altogether unprepared to find such an intensely black and white image as it afforded. As in the former instance, the lines were absolutely clear, but on a dark brown, non-actinic ground. We need hardly say that the exposure required was much less than that necessary for the photo-mechanical plates, for, as is well-known, the isochromatic plates are well fitted for instantaneous exposures. We actually gave about one-eighteenth of the previous exposure, with the result just stated. There was here an immense saving of time, but with the disadvantage of working afterwards in the dimmest of red lights for fear of fogging the plate. Mawson and Swan's plates, on the other hand, can be worked in a yellow light without fear of disaster. The other brand of plates to which we have alluded as being suitable for this class of work is made by England, but we have not tried them.

There still remains the difficulty of reversing the negative, which is necessary for photo-mechanical work. Few photographers possess a surface-silvered mirror, and the method which some have advocated of putting the plate in the dark slide wrong side before does not work well in practice. The makers should, therefore, bring out a *film* coated with suitable emulsion for this class of work, and then the last obstacle will be removed for those who wish to add to their business by producing these negatives for process work.

THE PROGRESS OF THE PHOTO-MECHANICAL PRINTING PROCESSES.

BY HERMANN E. GUNTHER.

II.

An interesting comparision has been made of late by C. Kampmann, of Vienna, between various chromate baths for sensitising photo-lithographic transfer paper. He found that the sensitiveness yielded is greatest in the case of those baths which contain ammonium bichromate (1,000 c.c. water, 43 grammes ammonium bichromate, and neutralised with ammonia ; or, according to Professor Husnik, 1,300 c.c. of water, 70 grammes of sodium bichromate, 30 grammes of ammonium bichromate, neutralised with caustic ammonia). By using baths which contain potassium bichromate, the sensitiveness is about one-third less ; it is, however, practically increased by the addition of manganous sulphate, as recommended by W. Weissenberger. By this addition not only the time of exposure is shortened, but also the impression becomes more distinctly visible on the bichromated paper during printing, because its colour becomes then deeper brown than usually. Moreover, the addition of manganous sulphate causes the transfer-ink to adhere more firmly on the rolled-up paper during development. The bath recommended by W. Weissenberger consists of :—

Water	1000 c.c.
Potassium bichromate	40 grammes
Manganous sulphate	5 ,,

It may be applied to any of the various existing gelatinised transfer papers, and by its use the same result is obtained as with an usual potassium chromate bath of a much higher state of concentration.

So far I have spoken about the treatment of the impression transferred to the zinc or stone plate, and of the preparation of the transfer paper : I may now be allowed to add a few directions as to the best condition of the negatives destined for photo-lithographic purposes. It is generally supposed by inexperienced operators that a negative which is to be reproduced by photo-lithography should show the lines quite clear, and the rest of the film absolutely dense and opaque. The latter is, however, not only unnecessary, but even unsuitable, since, if the negative is intensified until this density is obtained, the fine lines are liable to close, or at least to lose so much of their clearness that they will print very difficultly and defectively. Provided that a well prepared transfer paper is used,* a moderately dense negative is quite sufficient. With such a negative, also, the finest lines and points are printing, whilst the so-called false tone (see page 396) which is produced on account of the whites being not absolutely opaque may be easily removed by rubbing during the development of the rolled-up copy.

In order to obtain a negative of this kind—*i.e.*, of moderate density—a "hard" working collodion should be used. I suppose that the wet collodion process is used because it gives always the best results in this special case. A very good formula, which I have tried with perfect success, is the following one, recommended by Max Jaffé, an experienced photo-lithographer :—

Alcohol	100 c.c.
Calcium chloride	1·6 gramme
Cadmium iodide	7·8 grammes
Ammonium iodide	4·7 ,,

This iodizing solution is added to 1,000 c.c. of plain collodion of two per cent.

In the case of densely drawn originals of wood-cuts—copper and steel engravings, for instance—it will generally be unnecessary to intensify the negative ; if, however, in other cases, an intensification is required, the following method may advantageously be used. The following two solutions are prepared :—

No. 1.—A cold saturated solution of chloride of mercury.
No. 2.—A cold saturated solution of potassium iodide.

To solution No. 1 so much of solution No. 2 is added that the red precipitate, which forms at first, is redissolved. The mixture must be diluted as required for use, because it would otherwise act too strongly. The plate must, of course, be thoroughly washed before and after intensification.

The darkening of the intensified negative is done with hydrosulphide of ammonia, which is diluted with about four parts of water. The negative should appear entirely darkened after this treatment ; if it is not yet sufficiently vigorous, the operation may be repeated. Care should be taken that the hydrosulphide of ammonia is not applied in the same room in which the silver baths are placed.

In the case of gelatine plates being used instead of wet collodion plates, I can recommend the following combined eikonogen and pyrogallic acid developer as thoroughly reliable, with which any desired density may be obtained. The plate is at first developed with eikonogen, until the details of the drawing are well out ; then it is rinsed with water and re-developed with the ordinary pyro developer. The negative becomes at once denser, and its density may be increased to any desired degree.

* I have noticed that repeatedly inquiries have been directed to the Editor of this journal with regard to the "New Albert Transfer Paper," which I have described in a previous number. Since, as it seems, it is not yet procurable in England, I give here the address of the manufacturers : E. Jaffé and A. Albert, Wien, Währing, Theresienga'sse 17.

Photogravure.—With regard to photogravure, in which process great improvements have been made within the last few years in Germany, two important publications of a thoroughly practical character, in which the working details of the whole process in its present form are clearly and extensively described, deserve special attention. The first one, by E. Kiewning, has been published in the *Deutsche Photographen Zeitung*; the other one, quite recently, in the *Photographische Correspondenz*, by Rudolf Maschek, of Vienna. Upon these two communications the following lines are based. The two kinds of transfer paper which are used and recommended by Maschek are the diapositive paper of Braun and Co., of Dornach, for transferring the positive image, and the papers of the Autotype Company, of London, for the production of the relief-negatives.

The correct and careful composition of the etching baths is of special importance. Maschek prepares stock solutions, which he keeps in labelled bottles. For large plates he takes 20 pounds of chloride of iron, and dissolves them completely in distilled water, until the weight amounts to 1,500 grammes per 1,000 c.c. of the liquid. Afterwards he graduates the etching liquid, adding to the single baths so much distilled water that the specific weight amounts to :—

1·420 for the first etching (41° Beaumé).
1·375 for the second etching (38° ,,).
1·330 for the third etching (35° ,,).
1·285 for the fourth etching (31° ,,).

The dusting-in of the copper-plate with very finely pulverised asphalt is one of those acts upon which depends the success of the etching process to a high degree. For this purpose the Syrian asphalt must be sifted through a number of sieves, the openings of which become finer in succession, until it passes through a sieve of fifty-four to sixty meshes to each centimetre square. To prevent the exceedingly fine powder escaping during this procedure, the sieve should be covered with a white cloth reaching down to the table, and the table covered with white paper.

A GOOD MOUNTANT.—The following mountant is strongly recommended by Mr. W. Willis for delicate prints :—Weigh out 2 ounces of the best arrowroot ; mix it into a thick paste with 2 ounces of hot water, and then add 18 ounces of boiling water, stirring briskly. Soak half-an-ounce of gelatine in water until it is thoroughly soft and swollen. Stir this swollen gelatine into the hot arrowroot, with which it will quickly incorporate itself. Add ten or twelve drops of pure carbolic acid. This forms a stiff jelly when cold, and it should be used cold, being brushed on to the back of the prints or applied to them with a sponge.

HOW FAR CAN YOU SEE?—According to an American paper, there has been a great discussion going on in Europe concerning the distance at which large objects on the earth's surface are visible. Emile Metzger mentions that he once saw Keizerspickt, in Sumatra, when separated from it by a distance of 110 English miles ; he also says that on very favourable occasions he has managed to see Guy Merapi, in Java, when 180 miles intervened. E. Hill, the civil engineer, says that he has seen Mont Blanc from Piz Muraun, near Dissentis, a distance of almost 120 miles. J. Starkie Gardner states that Mont Blanc is visible from Piz Landguard, though distant about 3 degrees. Wymper, the explorer, says that when he was in Greenland he could plainly see a mountain peak from which he was separated by 150 miles. The whole range of the Swiss Alps has been looked upon by J. Hippisly while 200 miles away ; Sir W. Jones affirms that the Himalayas have appeared to his view from the great distance of 224 miles.—*English Mechanic.*

DEPTH OF FOCUS AND DIFFUSION OF FOCUS.

BY W. K. BURTON.

THERE has been so much discussion about the two subjects with which I head this communication, that I think a few words supplementary to what I have recently written on optics in the PHOTOGRAPHIC NEWS may not be out of place.

In one of these communications I defined, or rather tried to describe, "depth of focus," and I do not consider that it is necessary to repeat the definition here.

It has already been stated that depth of focus is inversely proportional to the diameter of the aperture, and to the focal length. From these facts there may be deduced others, a knowledge of which may be of some practical use to the photographer. Thus, assuming a certain maximum amount of want of definition as permissible, or not offensive in a photograph, we can work out a very simple rule that will tell us the distance of the nearest object that will be in focus at the same time as an indefinitely distant object, with a given focal length and a given aperture. Or, on the other hand, knowing the distance of the nearest object, and the focal length of the lens, we can get the size of stop that it is necessary to use so as to have the distance in moderate focus when the nearest object is focussed for, or *vice versa*. There is always some want of precision in applying such rules, because we have to assume that a certain definite amount of want of definition is permissible, and not more, whereas it is really a matter of artistic judgment in the case of each particular subject how much the less important parts of the picture should be subordinated to the principal subject by allowing them to be out of focus. Moreover, as pointed out by Mr. W. E. Debenham, the roundness of the field of lenses prevents any rules that can be formulated from applying to objects near the side of the plate, except when a very narrow angle is included, and when, in consequence, the field is practically flat. The effect of roundness of field is, that objects near the edge of the plate, far nearer than indicated by any rule, may be in focus at the same time as the distance projected on the middle of the plate. Still, it is often useful even to know what is the nearest object not very far from the centre of the plate that will be in focus at the same time as the distance, or to know what diameter of stop is the largest that we may use with a foreground object at a certain distance focussed without getting the distance much out of focus.

In measuring lack of definition, whether due to lack of depth of focus or to spherical aberration, the term "disc of confusion" of such-and-such a diameter is used. The meaning of this is, that if a mathematical point in the image is focussed, that point will be represented in the image by a blurred spot of a certain diameter. Thus, a fixed star may be considered as practically a point. If it be said that a certain lens has so much spherical aberration as to "give a disc of confusion of $\frac{1}{100}$ of an inch in diameter," the meaning is that, however we focus our lens, the image on the ground glass will not be a point, but a spot of not less than $\frac{1}{100}$ of an inch in diameter.

It is generally assumed that it is permissible, at least in the case of "the distance" in a photograph, to allow a point to be represented by a disc of $\frac{1}{100}$ of an inch in diameter, the reason being that, when looked at from the ordinary distance that is generally unthinkingly selected by people of normal sight, such want of definition does not amount to blurring, but amounts only to a barely

appreciable amount of softness. Indeed, there are many who are not even satisfied with the amount of softness thus given in the distance even of landscapes, much less in the case of figure subjects or portraits. Mr. Debenham has farther pointed out that a rule that allows the same amount of lack of definition due to want of depth of focus for all sizes of pictures cannot be a reliable one, as we look—or ought to look—at large pictures from a greater distance than we look at smaller ones from. This is correct, no doubt, but I cannot agree that such a rule as I mention is without any use, for—always bearing certain limitations in view—I have used it in practice for years, and have found it very handy.

In the first place, as regards very small work, we ought to look at such photographs from a very near point of view in most cases, and there are differences between different people as to the nearness from which they will look at a small picture. Thus the writer—though having good sight for distant objects without artificial aid—finds that he can, without excessive strain, examine photographs at a distance of only six inches from the eye; but he believes he is right in supposing this to be uncommon, and that not many will voluntarily hold even a small photograph much nearer to the eye than twelve inches.

On the other hand, it must at once be admitted that the rule is useless for small negatives that have to be enlarged, and that it is not correctly applicable to very large work, in which considerably more softness than is represented by the $\frac{1}{100}$ of an inch disc of confusion is always permissible, or even desirable for artistic effect.

In practice, I consider that the rule that takes a disc of confusion of $\frac{1}{100}$ of an inch as a standard is fairly applicable to all work that is not to be enlarged, and that is not of a size (say) larger than 15 by 12. The rule was stated by the present writer, in the PHOTOGRAPHIC NEWS, some years ago, in a form that is not *absolutely* correct, but that is well within anything that is needed in practice, and that has the advantage of great simplicity. It was stated in words somewhat as follows:—

"To find the nearest object that may be focussed for without putting the distance more than just perceptibly out of focus with a given stop, multiply the diameter of the stop in hundredths of an inch by the focal length of the lens."

FOCUS TABLE FOR DETECTIVE CAMERAS AND OTHER SPECIAL WORK

Focus of lens in inches	Decimal Standard Stop Numbers.								Ratio Marked on Stops												Focus of lens in inches
	5	10	15	20	25	30	35	40	f/7	f/8	f/9	f/10	f/11	f/12	f/13	f/14	f/15	f/16	f/17	f/18	f/19	f/20	
	Number of feet and inches after which all in focus.								Number of feet and inches after which all in focus														
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	
4	19·4	13·8	11·5	9·10	8·9	8·0	7·5	7·0	19·4	17·0	15·1	13·8	12·5	11·5	10·7	9·10	9·2	8·8	8·2	7·8	7·4	7·0	4
4½	21·10	15·4	12·10	11·1	9·10	9·0	8·4	7·10	21·10	19·2	17·0	15·4	14·0	12·10	11·10	11·1	10·4	9·9	9·2	8·8	8·3	7·10	4½
4¾	24·5	17·3	14·5	12·5	11·1	10·1	9·4	8·9	24·5	21·5	19·1	17·3	15·8	14·5	13·3	12·5	11·7	10·11	10·3	9·9	9·3	8·9	4¾
5	30·2	21·3	17·9	15·3	13·7	12·5	11·6	10·10	30·2	26·5	23·6	21·3	19·4	17·9	16·5	15·3	14·3	13·5	12·8	11·11	11·4	10·10	5
5½	33·3	23·4	19·6	16·10	15·0	13·9	12·8	11·11	33·3	29·1	25·11	23·4	21·3	19·6	18·1	16·10	15·9	14·9	13·11	13·2	12·6	11·11	5½
5¾	36·5	25·8	21·5	18·5	16·5	15·0	13·10	13·0	36·5	31·11	28·5	25·8	23·4	21·5	19·10	18·5	17·3	16·2	15·3	14·5	13·8	13·0	5¾
5¾	39·10	28·0	23·5	20·1	17·11	16·5	15·2	14·3	39·10	34·11	31·1	28·0	25·6	23·5	21·8	20·1	18·10	17·8	16·8	15·9	14·11	14·3	5¾
6	43·4	30·6	25·6	21·11	19·6	17·8	16·6	15·6	43·4	38·0	33·10	30·6	27·9	25·6	23·6	21·11	20·6	19·3	18·1	17·2	16·3	15·6	6
6½	47·0	33·0	27·7	23·9	21·2	19·4	17·10	16·9	47·0	41·2	36·8	33·0	30·1	27·7	25·6	23·9	22·2	20·10	19·8	18·7	17·7	16·9	6½
6¾	50·10	35·9	29·10	25·8	22·10	20·11	19·3	18·1	50·10	44·6	39·7	35·9	32·6	29·10	27·7	25·8	24·0	22·6	21·3	20·1	19·0	18·1	6¾
6¾	54·9	38·6	32·2	27·8	24·8	22·6	20·9	19·6	54·9	48·0	42·9	38·6	35·0	32·2	29·9	27·8	25·10	24·3	22·10	21·7	20·6	19·6	6¾
7	58·11	41·5	34·7	29·9	26·6	24·3	22·4	21·0	58·11	51·7	45·11	41·5	37·8	34·7	31·11	29·9	27·9	26·1	24·7	23·3	22·0	21·0	7

Example:—A lens 12 inches focus is used with a stop 1½ inches in diameter (*f*/8). The diameter of the lens in hundredths of an inch is 150. 150 × 1 foot = 150 feet. What is meant, then, is that we will have the distance in very nearly sharp focus when focussing for any object at the distance of 150 feet, and not near the edge of the plate; but that if we focus for a nearer object, the distance, using a stop of 1½ inches diameter, will be very clearly out of focus—a thing that may or may not be desirable.

If we know the distance of the object that we intend to focus for, and wish to know what stop we may use so as to get the distance just nearly sharp, the rule is as follows:—Divide the distance of the object by the focus of the lens, and the result will be—in hundredths of an inch—the size of the largest stop that will not put the distance conspicuously out of focus.

Example:—A lens of 16-inch focus is being used, and the principal object is at a distance of 100 feet. It is wanted to know what is the largest stop that may be used, focussing for the principal object, without putting the distance more than a little out of focus. Divide 100 feet by 1⅓ feet (16 inches). The result is 75 and ·75 inch, or ¾-inch is the largest stop that may be used, unless it is wished to put the distance conspicuously out of focus.

These two rules may be put in the shape of formulæ, eliminating the slight error—equal to once the focal length—that there is in them both, as follows:—

$$D = (100\,d \times f) + f$$

$$d = \frac{D}{100\,f + f}$$

where—

D = Distance in feet of the nearest object that may be focussed for without putting the distance conspicuously out of focus.

d = the diameter of the stop in inches.

f = the focal length of the lens in feet (or the fraction of a foot).

This table will be readily understood from what goes before. Instead of heading the columns of figures "number of feet and inches after which all is in focus," I should prefer to head them "distance of the nearest object that may be focussed for without putting 'the distance' more than just perceptibly out of focus." In using a detective camera for the kind of work that it is generally used for, and when it is not possible to focus for each subject separately, the camera should be adjusted, before starting, by *extending* it till a distant object is just perceptibly out of focus with the stop most commonly used. If this be done, the distances in the tables will, approximately, be the distances of the objects that will be in *sharpest* focus, and all objects within half these distances of the camera will be within nearly perfect focus.

The table has been constructed on the basis of a "disc of confusion" of $\frac{1}{100}$ of an inch. If it is wished to use the table for lenses of longer focus than any given in it, still on the basis of a "disc of confusion" of $\frac{1}{100}$ of an inch, the distances must be increased in the ratio of the square of the focal lengths. Thus, for focal lengths two, three, or four times those mentioned, the distances must be multiplied four, nine, or sixteen times. If, on the other hand, in the case of long-focus lenses, the figures be increased directly as the focal lengths of the lenses—two, three, or four times for focal lengths, two, three, or four times those given—and objects at the distances thus got be focussed for, it will be found that "the distance" is, in all cases, perceptibly out of focus, but not to an extent that will generally spoil a picture.

It is true that, if such a rule be adopted, very small photographs will, when looked at from the distance that most people find it comfortable to look from, will appear "sharp all over," a thing which some photographers consider very inartistic: but then it must be borne in mind that photographs taken with lenses of shorter focal length than the shortest distance that they can be comfortably looked at from, can never give a true impression in any case, unless enlarged or looked at through a magnifier. But if enlargement be resorted to from these small photographs, the amount of lack of definition in the enlargements will be the same as if the photographs were taken direct.

(To be continued.)

PROPHETIC.—"I have a lively presentiment that the time will come when a work will be judged by its merits, and not by the method of its production; and then, with some fostering care, things can and will be done that scarcely believers, and never unbelievers, yet dream of in their philosophy."—O. G. REJLANDER.

RED GLASS.—A new red glass has been recently produced in Germany. Besides its use for the manufacture of bottles, goblets, and vases of various kinds, it will be found applicable in photography and in chemists' and opticians' laboratories. This glass is produced by melting in an open crucible the following ingredients: Fine sand, 2,000 parts; red oxide of lead (minimum), 400; carbonate of potash, 600; lime, 100; phosphate of lime, 20; cream of tartar, 20; borax, 20; red oxide of copper (protoxide), 9; and bioxide of tin, 13 parts. By a single melting a transparent red glass is said to be obtained of a very fine quality, of which various objects can be manufactured directly, without the necessity of a second heating to intensify the colour.—*Scientific American.*

PHOTOGRAPHIC EXHIBITIONS.

BY GEORGE DAVISON.

III.—THE MEDAL SYSTEM.

THERE has been such a rapid advance in general opinion regarding reformed regulations for Photographic Exhibitions that it is to be regretted that the full and essential step of sweeping away the whole prize system has not been more boldly advised and urged. Several short steps are, however, frequently safer than a rapid leap, and, no doubt, the majority will soon recognise that a system of competition is detrimental to, and should be, as far as possible, kept away from anything like a serious devotion to art. What would be thought of an argument which recommended newspaper or any other poetry competitions as a good nursing system for a poet of nature? It is the same with good art. There is certainly much that is inferior which must be, and is commonly, classed as art, and, just as these versifying competitions may develop a facility in "doggreling," so the craze for prizes may tend to multiply third-rate efficiency. But it leads to imitation and sensationalism in a matter where the best can only be hoped for from subtle insight, the result of undisturbed study and practice. These artificial classifications into good, bad, and indifferent never yet helped a man to do anything great. They may possibly have spurred on certain temperaments in an unhealthy ambition to be accounted amongst the best photographers; but the lesson is soon learnt that it is possible, by accumulated distinctions, to be accounted a "best" photographer, and yet to be absolutely innocent of originality or artistic culture. Competitions may serve the purposes of modern enterprising newspapers, anxious for an "advertiser's circulation;" but, however directed, they can never forward the highest purposes of art, whether by photography or any other technique. Perhaps the worst of all such competitions are those in which a "set subject" is given, whether poetry in couplets or stanzas to be illustrated, or abstract ideas to be schemed in concrete form and pictures of this "machinery" taken. The artist must work in a way different from this. He has to arrive at such a state of cultivation that he can understand what Nature in her varying moods says to him direct, and he may not come to her with preconceived notions of finding what some one else has first seen and expressed.

The only arguments which have been forthcoming in support of a prize system in photographic exhibitions have been based on love of excitement, on business considerations by a portion of the exhibitors, and on the anxiety of the promoters for the financial success of their enterprise. No doubt the sweeping away of awards would remove much of an inferior kind of interest which these and other lotteries excite; but this would be highly beneficial. It can hardly be believed that men will not exhibit without the inducement of these vainglorious competitions. If that be so, the probability is their exhibits are best not seen publicly at all. The whole case is fairly met by the rigid exclusion of all distinctly inferior exhibits. The adoption and efficient carrying out of this system is, I believe, the best means of improving the influence and effect of our photographic exhibitions. Such a plan has never yet been adopted in any notable open exhibition. The element of interest and competition, it may be said, will remain, inasmuch as acceptation becomes the award, and this is, to a certain

extent, true; but degree in these and in most questions is of first-rate importance. The separation is easy, and a broad classification of good and bad is a not unwholesome corrective, and is free from the evils which follow in the train of a system of "bests" and of hair-splitting and erratic judging. How easy such a wholesale weeding out would be is well-known to all who have had any experience in comparing and hanging the entries at any large exhibition. Those pictures near or upon the border-line of acceptability would at times appear to receive unequal treatment, but this is but a small objection. Generally speaking, fifty per cent. might well be spared, and no one have any fair ground for murmuring. To come to actual example, it would be possible to wax enthusiastic over what the Exhibition of the Photographic Society of Great Britain might become under such a revised and improved system. It would be a more impressive lesson to photographers, and do greater credit to photography amongst artists and the cultivated. Very little of the more harmless interest argued for the medal system would be lost. The question would be, "Are my pictures hung, and where?" I venture to think there would indeed be a wider interest roused amongst exhibitors and the public, as well as greater service done to the art. All other considerations are small compared with the improved average of the exhibition, and the higher estimation in which it would be held by those whose valuable opinion soon becomes the popular view.

It is sometimes argued that the experiment has been tried, and has proved a failure. This is not true. The experiment has *never* been made. Certainly, medals were dispensed with at the exhibition of the Photographic Society of Great Britain in 1888, but there the thing began and ended. There were too many concerned in influencing the exhibition or its management who, for some personal or business reason, took exception to any reform in this respect, and with these it has been the practice to quote the experiment as an instance in support of their view. But their contention is unjustifiable. The attempt was but a lame and disorganized one, and the intention of the change was in no way explained or understood. I lay great stress upon that point. If the aim of the reform had been fully and fairly put before exhibitors, as it ought to have been, many would have made special effort, the credit deserved would have been given, and the exhibition would have retained its supremacy. Not only was no intimation of the change given, but, if anything, less energy than usual was displayed, and the few opponents of the movement seemed to claim credit for doing their utmost to spoil the exhibition, a result that was certainly not attained. After doing their best to ensure failure, they point to the result as a triumph for their foresight; but on very insufficient grounds. The number of photographs at that exhibition was the same as usual, and there was about the same proportion of amateur and professional exhibitors; with the exception of half-a-dozen abstentions, all the customary men were represented, and the average was but slightly lower than usual. As I have said, the full reform was not effected at all. The essential portion of any such scheme—rejection of inferior exhibits—was altogether omitted. As is the rule, practically *all* the entries were accepted. And yet this is referred to as a fair test. If the members and executive of the Photographic Society of Great Britain were loyal to their organization and to photography, and applied definiteness and energy in explaining and urging forward the higher form of exhibition—a rigid weeding out, with careful and tasteful arrangement of the pictures—then the result could not fail to be superior to the ordinary annual collection. Other societies in England have already schemed out such a plan of action, and in Vienna the excellent club there established is adopting the higher form of regulations for its 1891 exhibition.

NEW PHOTOGRAPHIC OBJECTIVES.*

BY DR. ERNEST ABBE AND DR. PAUL RUDOLPH.

No. I.

Our invention relates to photographic objectives, and the improvement consists in the construction of a system of lenses in which the function of collecting the rays of light forming the image, and that of correcting the spherical and chromatic aberration, are allotted to distinct parts of the system.

In constructing photographic objective-glasses in which the advantage of an extended image-field is to be coupled with a large, effective aperture, particular difficulties are encountered in attaining the desired degree of absence of spherical aberration of the pencils of light that produce the image. In view of obtaining the extended field aimed at, objectives of the usual types require to be provided with lenses of high curvature, and these always give rise to certain residual spherical aberrations (the so-called "zones") whereby the distinctness of the image is impaired when the aperture is fully open.

For the purpose of obviating this defect, and simultaneously facilitating an improved correction of the chromatic aberration, we compose the objective of two uncorrected single collecting lenses, which, in view of the aplanation of the field, have their convex or more convex sides turned outwardly, and a correcting-system possessing an infinite, or a large positive or negative focal length, so that it does not at all, or but inconsiderably, alter the focal length of the two collecting lenses combined; the said correcting-system being constituted by two or three single lenses cemented together and arranged between, and separate from, the collecting lenses. By means of this disposition it is possible to considerably diminish the aforesaid residual spherical aberration or "zones." At the same time, it gives a wider scope in the selection of the glasses to be employed in the manufacture of the lenses composing the correcting-system. In particular, it furnishes favourable conditions for the application of those kinds of glass which have the property of almost completely uniting three colours of the spectrum, or, in other words, which neutralise the secondary spectrum, and thus produce a superior degree of chromatic correction. The construction, therefore, yields comparatively ready means for the manufacture of such highly achromatic objectives as are called "apochromatic," according to the terminology introduced by Professor Abbe.

The Death of Mr. T. B. Jordan.—The death is reported of Mr. Thomas Brown Jordan at the age of eighty-two. Mr. Jordan, who was born in Bristol in 1807, began life as an artist, and, after turning his attention to physical science, he established himself in Falmouth as a mathematical instrument maker. In 1838 Mr. Jordan devised an instrument for recording by photography the variations of the barometric column. About the same date he invented a declination magnetograph and a self-recording actinometer.

* This is a patent specification issued in England last Wednesday.

NEW PHOTOGRAPHIC LENSES.*

BY DR. PAUL RUDOLPH.

No. I.

My invention relates to photographic objectives, and the improvement consists in the construction of the objective of two separate systems of lenses, the individual members whereof have, relatively to each other, particular refractive properties.

A main difficulty to be overcome in the construction of photographic objectives, besides realising the other numerous conditions subject to the purpose which these objectives have to serve, consists in sufficiently compensating the astigmatism of the obliquely incident pencils of light, and in removing the indistinctness of the marginal portions of the field resulting from such astigmatism. And, in fact, all the photographic objectives constructed so far possess more or less this deficiency, that with an approximately plane field the focus of a group of rays within a primary (meridional) section of an oblique pencil of rays, remains at a greater distance than the focus of the group of rays within a secondary (sagittal) section of the same pencil.

After a course of investigations on the conditions whence results this anomaly, and the means of mitigating its effects, the photographic objective forming the subject of this specification was arrived at. It is mainly a dissymmetrical combination of lenses composed of two distinct systems of single lenses cemented together. This combination of lenses is characterised by the concurrence of the following two properties:—

1. That in one of the two distinct systems the positive member (collecting lenses) has a smaller, in the other system, however, a greater refractive index than the negative member (dispersing lenses) cemented thereto.

2. That each system in itself is approximately achromatised, *i.e.*, that the chromatic aberration of each of the systems, expressed by the difference of the reciprocals of its focal lengths for two different colours, is small as compared with the chromatic aberration of a single crown glass lens having the focal length of the entire objective, the latter chromatic aberration being measured after the same manner as the former.

A combination of lenses realising both these requirements simultaneously presents particular advantages. On the one hand, it admits of the astigmatic differences being removed without rendering the application of more than two distinct systems necessary, and, on the other hand, it yields favourable conditions for satisfying all the other requirements connected with the correction of photographic objectives.

The above defined contrariant combination of the two distinct systems composing the objective furnishes the simplest means for compensating the astigmatic differences of oblique pencils. This is due to the fact that a system composed of lenses cemented together, and in which the collecting lens has a greater refractive index than the dispersing lens, gives rise to astigmatic differences opposite to those caused by a system of lenses the collecting lens whereof possesses a lower refractive index than the dispersing lens.

With the mode of compounding both parts of the objective as indicated above, it is, therefore, only necessary to choose the ratios of the single lenses in both these parts in such a manner that the opposed astigmatic differences are of the same magnitude, in view of attaining compensation of this astigmatism, or an astigmatic correction of the entire objective.

But in order that the realisation of this condition does not enhance the difficulty of achromatising the whole objective, it is essential that the objective possesses also that second property as defined at the beginning of this specification, *i.e.*, it is necessary to effect the contrariant composition of the two separate systems in such a manner that at the same time each system may be in itself achromatised. It is, however, neither particularly advantageous nor in all cases practicable to perfectly achromatise the individual members of a double objective; for the mere thicknesses which must be given to the lenses may, in each member of the objective, necessitate deviations from achromatism amounting to about one-fourth of the chromatic difference of the reciprocals of the focal lengths of a single crown glass lens having the focal length of the whole objective. But it is of practical importance that the mode of composing the systems of lenses does not in itself involve any limitations even to their approximate achromatisation, and that it does not render inevitable still greater chromatic differences than are required to meet other conditions.

This last requirement may be satisfied by a suitable choice of the combinations of glass which are employed to form the two parts of the objective. The following observations may explain the principles which govern the selection of suitable glasses.

Those pairs of glasses (crown and flint) which are generally resorted to in the construction of achromatic lenses (and which a few years ago constituted the sole means of obtaining achromatism) possess this characteristic feature, that a higher refractive index invariably implies a greater relative dispersive power. (Under the term dispersive power is to be understood, as usual, the quotient $\frac{\Delta n}{n-1}$, *i.e.*, the difference between the refractive indices for two different colours divided by one of these indices, or by the mean index of refraction minus one.) A pair of glasses of this kind—which may be said to be of a normal character—admits of the application of positive (collecting) systems, if achromatism is to be attained, only under the condition that the positive element has a lower refractive index than the negative.

Recent progress in glass manufacture has, however, added to the list of optical glasses other kinds of glasses which admit of such pairs being selected, in which the relation of the refractive indices and the relative dispersive powers is just the opposite as in the other case, *i.e.*, in which the glass having the higher refractive index does not also possess the greater, but, on the contrary, the smaller relative dispersive power. Such pairs of glasses may be said to be of an abnormal character, in contradistinction to the first-named class.

The application of pairs of glasses of the last-named or abnormal character admits of the production of systems with positive focal lengths in which, without prejudice to the attainment of achromatism, the more refractory medium acts as the positive (collecting) element.

* This is a patent issued in this country last Wednesday by Dr. Paul Rudolph, mathematician, of Jena.

THERE can be little doubt, Mr. Lockyer believes, that in the Parthenon the greatest function was when the chryselephantine statue of Pallas Athené was lighted up by the rising sun. In Greece the eastern horizon was used, in Egypt both east and west.

PHOTOGRAPHY AT GREENWICH OBSERVATORY.*

BY THE ASTRONOMER ROYAL.

THE tube for the 28-inch refractor, which is of special construction, has been made by Sir H. Grubb in preparation for the object-glass which is now being figured. The experimental 4-inch object-glass referred to in the last report was mounted on the Sheepshanks' equatorial, and eighteen photographs were taken with it last summer, the lenses being separated for photographic achromatism, and the crown lens reversed to correct for the spherical aberration introduced by the separation. The best distance of separation was determined, and the photographs obtained were found to be quite satisfactory. The completion of the 28-inch object-glass has been delayed, presumably by the pressure of work on the 13-inch photographic telescopes, which have engaged so much of Sir H. Grubb's attention, but it is hoped that the new refractor will be ready for mounting very shortly.

The $12\frac{3}{4}$-inch refractor, which will be dismounted shortly, would be very useful for the observation of comets, occultations, and phenomena, for which it is well adapted. It might with advantage be mounted on the Lassell equatorial in substitution for the much heavier tube and cradle of that instrument, the provision for rotation of the mirror and tube (which necessarily adds greatly to the weight) being dispensed with. The tube of the refractor would, I believe, provide a good attachment for a large mirror, $3^m.43$ ($11^{ft}\ 3^{in}$) in focal length, which Mr. Common has generously offered to make for the Observatory. Reference has already been made to the expediency of mounting the Lassell equatorial at a greater elevation above the ground.

The 13-inch photographic refractor, with 10-inch guiding telescope by Sir H. Grubb, has been lately mounted in the new 18-foot dome over the computing rooms, and one or two trial photographs have been taken with it. The definition appears to be very good for stars near the centre of the field, but the marginal images might, perhaps, be improved by a slight readjustment of the lenses.

For determinations of motions of approach or recession of stars 457 measures have been made of the displacement of the F line in the spectra of 26 stars, and 20 of the *b* line in the spectra of 5 stars, besides comparisons with the spectra of the moon, the sun, or the sky as a check on the general accuracy of the results. Observations of Algol on seven nights confirm as far as they go the previous results indicating orbital motion. The observations of Spica made in past years are found by Professor Bakhuyzen to be tolerably well represented on the hypothesis of orbital motion with a period of $4^d\ 0^h.356$, agreeing well with that recently discovered by Dr. Vogel's photographic method. As the series of observations with the $12\frac{3}{4}$-inch refractor (extending over fifteen years), will be shortly brought to a conclusion, it is proposed to discuss them with a view to the detection of orbital motion, whether of long or short period, there being indications of this in the case of several stars.

In the year ending 1890, May 10th, photographs of the sun have been taken at Greenwich on 212 days, and of these 439 have been selected for preservation, besides thirteen photographs with double images of the sun, for determination of zero of position.

For the year 1889 Greenwich photographs have been used on 173 days, and photographs from India and Mauritius filling up the gaps in the series on 187 days, making a total of 360 out of 365 on which photographs have been measured in this year.

The sun has been free from spots on 211 days in the year 1889, the longest spotless period being October 23rd to December 11th. There were also eight other spotless periods of more than a fortnight. The mean daily spotted area in 1889 was 78, as compared with 89 for 1888; but the mean daily area for the latter half of the year was nearly twice as great as for the earlier half, being 103 as compared with 53. Again, the mean distance of spots from the equator was $5°{\cdot}46$ in the first six months, and $14°{\cdot}72$ for the last six; and both these facts thus point to the middle of the year 1889 as a well defined date for the sun-spot minimum.

The photographic reductions are complete to 1890, January 6th, and the copy for press to 1889, December 31st, is in the printer's hands.

Photographs from India and Mauritius have been received from the Solar Physics Committee, and have been measured as far as 1890, February 17th and February 14th respectively.

As regards the further discussion of the results of former years:—

Ledgers of the positions and areas of spots for the years 1882, 1883, and 1884 are being formed. Similar ledgers for the years 1878-1881 (including the results from the Indian photographs, measured under the direction of the Solar Physics Committee) have been completed, and the mean results formed.

Melbourne photographs, available for filling up gaps in the series in the years 1875 and 1876, have been measured, and the reduction attempted; but it appears, from an examination of the results, that the information received as to the orientation of the plates is incorrect, and until further particulars are obtained from Melbourne the reductions cannot be proceeded with. All the available photographs taken at Harvard College during the same years have now been measured and completely reduced, 64 having been measured in the past year.

The discussion of personality in measurements of 8-inch photographs by 9 observers, and the discussion of probable error in measurements of 4-inch photographs, have been completed and published in the Photographic Results for 1888.

* A portion of the official report of the Astronomer Royal, issued last Monday.

SOLUBLE SACCHARATE OF IRON.—Athenstaedt's process is given as follows in the *Moniteur Scientifique*: A solution of a ferric salt, 1 to 100, is precipitated by a similar solution of ammonia or fixed alkali, taking care to operate at a temperature of about 10° C., and in all cases below 15° C. The precipitate must be washed rapidly, in the dark, with distilled water having also a temperature between 10° and 15° C. The ferric hydrate thus produced is then mixed with powdered sugar in a quantity so regulated that the dry preparation will contain three parts of metallic iron to one hundred parts of sugar. The mixture of hydrated ferric oxide and sugar is maintained at the boiling point until the oxide of iron becomes dissolved in the syrup. The dry product is obtained by drying in vacuo at a low temperature. This saccharate of iron (a most improper name, as it contains no saccharic acid) may be kept in solution made by diluting the mixture when cold by pure distilled water. We are told that these solutions are clear, and that they remain so indefinitely, without any further addition or any special precautions.—*Burgoyne's Monthly Circular.*

Notes.

An interesting article in *Harper's* on modern French painters reveals the fact that there is a rival to Mr. Muybridge in the person of M. Morot, whose eye is so sensitive and so educated that he can follow the movements of a horse almost as quickly as does an instantaneous camera. This faculty has led M. Morot to be accused of painting the movements of horses as they have been ascertained by instantaneous photographs; but, in point of fact, he has never used photography at all; indeed, he had already made his observations of the movements of the horse before Muybridge gave to the world the result of his remarkable experiments. M. Morot, when a youth, spent nearly all his time in the *manège* of a friend of his family, who was a horse trainer. The result of his observations was the discovery of much error on the part of artists in drawing horses in motion. He discussed the matter with the riding-masters of Nancy, had fine sand laid down in the *manège* to catch the foot-prints, and, in order to facilitate his observations, invented a little apparatus composed of a cardboard tube, with two horizontal slits in it, one exactly opposite the other. This tube, held before his eyes, and turned sharply with the fingers, formed a shutter or "obturator," on the same principle as the shutter of a photographic camera, closing the field of vision in about the fortieth part of a second. By means of this apparatus he watched the movements of the horse and analysed them, and each element of the movement impressed itself upon his finely-cultivated retina so sharply that he was able to draw it immediately from memory.

Thus, thanks to the extraordinary sensitiveness of his eye, aided by this little cardboard tube and a patient pencil, he discovered nearly the whole theory of the horse's movements while he was still a boy; but M. Morot was not such a pedant as to adhere to the observations of what might be called abnormal vision. In painting horses in movement, some compromise has to be made between microscopic observations and ordinary eyesight. He therefore gets over the difficulty by avoiding in the principal figures all intermediary elements of movement; he selects rather the beginning or the end. In the confused mass of a cavalry charge, he will paint one horse completely, and the rest of the troop will be bits of horses, elements, and movements, all the phases which scientific analysis gives, and this agglomeration and detail create the illusion of a vision of rushing horses.

Some sharp-eyed critics have been discovering in the pictures of the Royal Academy further incongruities, one of which was alluded to in these pages a fortnight ago. The lighting of Mr. Albert Moore's picture "A Summer Night" has been called in question as not being like anything yet seen in nature. Mr. Chevallier Tayler's "The Last Blessing" is also declared to be inaccurate. The priest, in this picture, is simply holding up two fingers, whereas the whole hand should be raised, as the use of two fingers is only permitted to eminent dignitaries of the Church. Mr. Wyllie's picture of "Davy Jones's Locker" displays a slight ignorance of chemistry. The large anchor in the foreground is painted a red rusty colour, but iron under water does not take a red rust; it is only when exposed to the air that the red oxide is formed. It must be very disagreeable to artists when they find that chemistry cannot be made to correspond with art. But the anchor in question makes an effective piece of colour, and Mr. Wyllie's defiance of chemical laws is to be condoned on this score.

The death of Count Ostorog, better known as "Walery," is announced. The event came as a shock to a numerous circle of friends, as until recently he was in the prime of life and, apparently, in the best of health. Walery was a photographer and artist of no ordinary skill, and of unbounded energy. His business was recently converted into a limited liability company. It is the brother of Walery who has accompanied the expedition of the Chartered British South African Company on a special photographic mission. Some interesting pictures of Matabeleland, and probably its monarch, Lobenguela, may be expected.

Until last week, it was not certain whether the Ober-Ammergau Passion Play was a dramatic performance pure and simple, or in some fashion a religious ceremony. An incident which happened a few days ago must, however, settle the point once and for all. A prominent journalist distinguished himself by an excess of zeal, which the authorities regarded as an act of piracy. In order to provide his friends with reproductions of the scenes, he seated himself close to the stage, at one of the performances, with a photographic apparatus. He then went to work; but unfortunately, Caiaphas caught sight of him, and sent a messenger at once to stop further proceedings. Following on the heels of the first came a second messenger, demanding that the plates should be given up. The journalist refused, and was therefore taken before Caiaphas—who happened to be the Burgomaster of Ober-Ammergau—and charged with having trespassed upon the monopoly, for which certain concessionaires had paid a large sum of money. It so happened that the amateur was able to prove that he had communicated with the concessionaires, and had obtained permission. The result was a happy release, with an abundance of apologies.

Some time ago, attention was called in the NEWS to the experiments which have been made on the Continent, showing that out of a number of married couples photographed, and of an equal number of

brothers and sisters, it was found that a much larger proportion of married people resembled each other than did the brothers and sisters. The topic has emerged from the circle of photographic gossip, and has been discussed in the daily papers. A lively article appeared in the *Daily Telegraph* on Monday, in which the subject is treated in whimsical fashion. In some respects, however, the arguments of the writer are incomplete. For instance, he asks—"May a plain man catch the infection of loveliness from his pretty wife after ten years or twenty of companionship?" This theory, the writer goes on to say, gives certainly a great advantage to the owner of feminine loveliness. This is all very well; but what about the other side of the picture? May not feminine loveliness contract a few of the masculine defects? We also fail to note any moral deduced by the writer from his speculations. Obviously, if anything is to be learnt from the resemblance between married people, it is the bearing which this resemblance or want of resemblance may have upon happiness in married life. Would it not be worth while, therefore, for the legislature to insist upon the principals in divorce cases being photographed, so that some kind of data might be arrived at on this interesting point?

M. Gaston Tissandier, in an article on flash-light photography in *La Nature*, gives a hint which those who are fond of this pastime will do well to remember. He strongly urges the sitters not to place their eyes in the direction of the light, as they are almost certain to shut their eyes at the moment of exposure, and the effect in the picture will be that they are either blind or asleep. People to be photographed ought to look on one side, or better still, take an attitude of reading a book or looking at an album. The latter suggestions do not strike us as particularly novel. The piquancy of flash-light photographs lies in their unconventionality. It is quite possible, with a little ingenuity, to get pictures of domestic life where the figures shall not appear asleep, without resorting to the very much played-out book. In flash-light photography by means of magnesium powder, as in photographing by the electric light, one of the chief problems demanding attention is the suitable diffusion of the light.

The notes in reference to photography and the Tower of London have done good. They have made known the fact that the Tower has *been* photographed, although not a single copy is to be found in the place where one would naturally expect it—namely, within the Tower itself. It is to be feared there is too much truth in Mr. Brooks's complaint contained in his letter of last week, that the photographic print trade has been spoilt, so far as the producer is concerned, by excessive competition. But this competition ought not to affect the sale of photographs in the Tower.

The application of photography to household decoration is gradually making headway, and we have lately noticed, with some interest, that there are displayed in many furniture shops tasty little screens, over-mantles, &c., in which are spaces for pictures. This is a far more sensible way of utilising photographs than is the custom of putting them into albums, because visitors to one's house can look at them or not as they please. They are too often given an album of pictures to examine just as if they were children, and required something to keep them quiet. We have occasionally experienced the tortures of looking through an amateur's album, and have found it very like, but not so enjoyable, as the room of horrors at Madame Tussaud's.

Now, if photographs are used for decorative purposes, only the very best are utilised, and if one of them has a premature attack of yellow jaundice, it is instantly removed, and a fresh copy takes its place. The owner watches over them with care, and they are not suffered to run to seed. But albums get neglected, and the majority of the pictures in them are often not fit to be seen.

Another field for photographic decoration is found in fanlights over doors, lamp shades, or, indeed, in any place where coloured glass interspersed with transparencies is admissible. The glass work is not difficult to lead together, and the metal grooving can be purchased at a cheap rate at many glaziers'. An article in an American paper was lately devoted to this subject, and it professed to give full directions whereby the amateur painter and glazier could put this kind of glass work together; but, strange to say, it omitted to state the kind of flux to use for soldering the lead work. The best that we have tried is Russian tallow, although rosin will act nearly as well. The pattern to be worked out in the glass is first of all drawn full size on paper, and while this pattern lies on a table the glass is cut, piece by piece, and fitted above it into the lead work. When one side is soldered, the entire mass is turned over, and the joints on the other side are joined up with the soldering iron.

Some persons are very fond of complaining that cameras and lenses are far too expensive, and that one often pays too dearly for the privilege of having a lens bearing a well-known name. But they forget that this name is a guarantee of value, and that some time hence, when, perchance, they are anxious to sell or exchange, it will give the article a far higher selling price than would be possible without it. These grumblers would be surprised to learn the cost of some of the best material used in camera construction. One well-known maker bought the other day a log of very handsomely figured mahogany. It was as hard as iron, and a camera made with it would be calculated to stand the vagaries of climate in any part of the world. The price paid for it was at the rate of three shillings and four pence per square inch.

THE GROSVENOR GALLERY.

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

THE visitor who inspects this collection of work chiefly with a view to increasing his own store of suggestions, and gatherings hints for his own work with the camera, will not find many striking pictures.

The first one will probably be No. 31 ("Youth and Age," E. E. Simmons), an old man nursing a sleeping child; the group, with its appropriate cottage surroundings, skilfully treated and truthfully rendered, with a back lighting through the cottage window. Subjects of this character are among the most suggestive to the camera man in search for suitable subjects.

No. 36 (Portrait of D. Q. Orchardson, R.A., by himself). It is most unfortunate that the nightmare-producing expression "greenery-yallery" should be so inextricably interwoven with the name of the Grosvenor Gallery, because it has a flavour on the tongue which one would gladly get rid of when there is presented to one's notice such admirable workmanship as this portrait undoubtedly contains.

No. 46 ("Goodbye," E. Harris), a clever treatment of strong outside daylight, and also cottage interior lighted by a small window. The truth of subdued, light tones is carefully worked out.

No. 72 ("Lustra," H. J. Hudson) is noteworthy for its treatment of some of the flesh parts in shade.

No. 90 ("Study of a Head," John da Costa), a small but admirable piece of careful, straightforward work. An old woman's wrinkled face under a light-tinted sun bonnet, in words does not sound anything worth painting; but it is not the subject, but the truth of the subject, that makes a picture of what might easily be a very ordinary sketch.

No. 115. Here we have another "painter painted," palette and all—viz., J. C. Noble, A.R.S.A.—by John Pettie, R.A. The portrait is not altogether restful for the eye; the strong light on the forehead, on the collar, and edge of the aforesaid palette all seem to claim attention one by one. The moral for portrait photographers, anyhow, is, do not have too many high lights struggling with each other for the observer's attention.

No. 127 ("Finished Sketch of the Traitor," by the same artist as No. 115). The title of this picture will convey a new idea to those who have followed in the ways of their forefathers in thinking that a *study* was an unfinished *whole*, while a *sketch* was a finished *part*; but with or without a title, there is much good work in the picture, even if the outlines of some of the limbs of the figures are striking.

No one will think of leaving this gallery without looking at S. P. Hall's remarkable little picture of the royal wedding party of July last (No. 141). On this party Mr. Stanley turns his back—or, rather, someone has so arranged the portrait of him (140) by Miss E. M. Merrick. On no account must be overlooked a pencil sketch of the Marquess of Salisbury, by the Marchioness of Granby. It is very seldom indeed that one sees such a clever sketch as this—a sketch truly it is, but one which drives home the lesson that a *few* lines in the *right* place are worth infinitely more than a million of them in the wrong place. (Retouchers, please note this in the largest mental capitals.)

Passing into the SECOND ROOM, 149 ("The First of September," D. Sadler) claims attention, and calls for inspection all over the canvas. It is a specimen of good workmanship, and too much of it—*i.e.*, so much detailed subject that it becomes a matter of effort to concentrate one's mind on the theme. Above this is 150 ("Court of Criminal Appeal," Sir A. Clay), portraits of some six well-known "lawyers," all very fine and large. The artist had by no means an easy task before him, and when all the circumstances of the case are grasped, it must be admitted that he has produced a creditable and memorable piece of work. Note carefully how the matter of variety, with unity of pose, has been worked out—befitting expressions as portrait studies, disposal of *twelve* hands!

No. 164 ("Washing Day," John Reid) brings up the thought, "too many figures; some are sure to move and spoil it."

No. 165 ("Miss Maude Millett," C. W. Bartlett) is an instructive study of the camera-artist. Note the effect of a side light on the flesh and white drapery; parts of the flesh seem almost too transparent for a portrait.

No. 174 ("Oporto," C. N. Hemy), a lot of good work, broadly treated in a simple scale of colour, resulting in good harmonious work, and not too much focus either.

No. 182 ("Striking a Bargain," G. King) is just the thing for camera men; many obvious hints may herefrom be gathered. Note and study this picture well. Now look at No. 155, over doorway ("Portrait"), and observe the effect of tilting the head the same way as the back of the chair tilts over: one of the arms, too, is more or less parallel. Another obvious note.

No. 205 ("A Moment's Rest," W. E. Norton). Although there is a general feeling of wishing for a bit more focus somewhere about the picture, yet, despite that unsatisfied longing, it is a painting of decided merit, and well worth the study of any artist. Of the portraits in this room, No. 203, by Hon. J. Collier, and No. 187, by F. M. Skipworth, are especially deserving of useful study.

In the THIRD ROOM, No. 239 ("A Silver Mist Melting in Softest Light," R. H. Carter), a group of fisher folk in an early morning mist, sorting and packing their catch, is a splendid picture. Here we have a reply, in part, to the advocates of the extreme fuzzy school on the one hand, and the *f*/64 school on the other, showing that it is not impossible to reproduce all the feeling of softness and distance, subdued detail, apart from fuzzy outline, and also that there may be plenty of detail, and even bright light, with a mist, without wiry crispness everywhere or anywhere. The unity of the whole picture and the melting of one plane into another, the gradual diminution of detail, are all points to be studied and remembered.

No. 248 ("Room in Brussels' Almshouse," H. Vos) is more pleasing as a collection of many studies than as a whole; the long line of figures introduces a difficulty not easy to overcome. The picture is in a low key, and broadly treated.

No. 259 ("Four Jolly Sandboys," Miss J. R. Taylor). This is the sort of subject in which a camera-man can get a long start, and it is from photographs (of the right sort) that artists might now and again take a hint in this kind of work.

Among the studies of the nude, we should select No. 288 ("A Water Baby," Hon. J. Collier), and No. 185 ("Boy and Dryad," C. N. Kennedy), as being worthy of considerable study.

No. 320 ("Portrait," L. Ward) produces a curious effect, and for the moment gives one the idea that the man is "standing on nothing" against a rather strongly tinted background.

No. 327 ("The Ramesum," J. Varley) shows admirably the effect of strong sunlight and sharp-edged shadow, without the soot and whitewash effect usually produced by the shutter maniac.

No. 341 ("Javanaise Dancers," A. Melville) gives one rather a shock. The exclamation, "What a splendid frame!" is almost irresistible.

No. 350 ("An Interior," Miss C. F. Jones), a skilful piece of work. Observe that the darker parts are not without a due share of detail. (Expose your next interior *fully.*)

Nos. 337 and 360 (Landscapes, R. B. Nisbet, R.S.W.), pictures of "almost nothing at all," and yet *pictures.* Why? Because there is truth of tone, true values, without which a painting is diagrammatic (if that), and lacking in the true essential element of every art, viz., *truth of proportion*, not only of *drawing*, but also of *detail*, of *tone* (light power), and *tint* (colour power).

One more picture, and one to linger over—viz., No. 371 ("The Missing Boat," David Green). It is not easy, nor is it pleasant, work seeking for a fault in a picture like this, which demands, and is entitled to, much in the way of praise. Some may say part of the immediate foreground is "to let"; and yet even its simplicity by no means detracts from the point of interest. Note the simple lines of the general scheme—harmony of figure-group of fisher folk, simplicity of their belongings, boat huts, and cloud drawing; the feeling of air, space, and largeness in the distance—all contribute in producing a picture of considerable power, and one which owes much to its parts being kept in true proportion throughout.

Notices of Books.

Magnesium Flash-Light Photography, by Robert Slingsby. (*London, Marion and Co.*, 1890.)

This book is written for those who intend to take up flash-light photography in a serious way, and not to take an occasional "chalky" picture by way of pastime. The pages are of large size, to accommodate specimen illustrations, and the literary contents are limited, but practical and to the point. The author tells how many more flash-lamps are necessary as the size of the apartment, hall, or theatre increases; how and where to place the lamps; how to give a large number of flashes simultaneously, and other miscellaneous information, the result of practical experience, for Mr. Slingsby has given special attention to this class of work. Much better pictorial and artistic results can be obtained by flash-light photography than occasional dabblers therein are prone to suspect. We consider Mr. Slingsby's book to be of practical value to professional and other photographers of the present time, and that it is the forerunner of a class of such works likely to appear when the system of flash-light photography is more elaborated.

On page 15, Mr. Slingsby quotes from the Photographic News of January 24th last a formula for making an explosive flash-light powder, containing perchlorate and chlorate of potash, which Professor Max Müller, of Weimar—as our German correspondent stated—"asserts" not to be so dangerous as a mixture containing no perchlorate. However this may be, we think the mixture to appear so dangerous upon theoretical grounds that, like all others containing chlorate of potash, the ingredients should be powdered separately, should not be kept mixed in bulk, but that only enough should be mixed at a time, with the feather end of a quill pen, to give the desired flash when exploded, otherwise deadly results may follow.

Photographischer Zeitvertreib. By Hermann Schnauss. (*Ed. Liesegang, Düsseldorf*, 1890.)

The matter of this work is much more interesting and instructive than its title—"Photographic Pastime"—might lead one to suppose. It is a description of such of the less practised photographic methods, including some that might be called "dodges," as are within the reach of an amateur, or of the professional photographer who likes to do something out of the regular groove of photographic business, without the necessity for any special costly apparatus—anything, in fact, that cannot be easily improvised with a little application and goodwill.

The first part of the work relates to the best means to adopt in photographing flowers, paintings, animals, snow scenes, and moving water. Then follows the photographing of electrical discharges, both natural and as produced by dynamic and other artificial sources. A very curious illustration is that of a seal photographed by its electrical condition, and not by any illumination thrown upon it.

We next come to a description of the means to be adopted for taking photographs—portraits particularly—by night. Here, in addition to a description of magnesium lamps, is a diagram showing the positions of the sitter, camera, light, and shield to protect the lens from rays proceeding directly from the flash.

In the next chapter, on photographic curiosities, we find doubles, spirit photographs, and caricatures dealt with and explained. A more serious question is then taken up, that of combined portraiture as introduced by Galton, the necessary simple appliances for which are fully illustrated. Following this chapter is one on photographing by means of what is called a pin-hole camera. Details of the method are given, but the illustration of a pin-hole photograph accompanying it has doubtless suffered in the process of conversion into a surface block necessary for use with the letter press, as it is not nearly such a perfect result as some that we have seen produced in this manner.

The tables given of time of exposure for different sizes of pinhole, and what stands for length of focus, should be found useful to any who may think of trying this method of producing photographs. Photographing by the aid of a telescope is a chapter which may be turned to practical account. Without going into astronomical photography, it not unfrequently happens that it is desired to obtain a larger image of some distant object than can be got with the lenses at hand.

The stroboscope, which is next described, requires more elaborate apparatus for the production of the necessary photographic negatives, but the same cannot be said of the photo-kaleidoscope pictures that follow in the work.

We have not exhausted the contents of the book, which includes printing with floral borders, printing direct from natural objects without the intervention of the camera, and other matters calculated to interest those readers who are not satisfied with merely treading the most beaten roads, but find pleasure in exploring the bye-paths which lead to results of a more unaccustomed character. The work is plentifully illustrated, and in such a way as to materially facilitate a ready grasping of the methods described.

CONVERSAZIONE OF THE ROYAL SOCIETY.

Breath Figures, and their Relation to Photography—Reversal of the Image in Breath Figures—The Rising Sun and Egyptian Temples—Sun Gods—Photographs of Wild Beasts—Photography and Forestry—Astronomical Photography—More Photographs of the Eggs of the Great Auk—Platinotype Portraits—Tornado Photographs.

Last Wednesday night the annual ladies' *conversazione* of the Royal Society was held at Burlington House. The president, Sir George Stokes, and his daughter, Mrs. Humphrey, received the guests. Among those present were :—

Dr. John Evans (treasurer), Professor Michael Foster and Lord Rayleigh (secretaries), Dr. Archibald Geikie (foreign secretary), the Lord Chancellor, Duke and Duchess of Sutherland, Earl and Countess of Rosse, Earl Compton, Lord Bramwell, Lord Thurlow, Lord Sackville Cecil, Lord Arthur Russell, Lord Basing, Lord Coleridge, Mr. A. J. Balfour, Lord Justice Fry, Bishop of Limerick, Admiral Sir John Hay, Admiral Sir George Richards, General Sir Peter Lumsden, General Sir Lewis Pelly, Sir James Caird, Sir Lyon Playfair, Mr. Justice Stirling, Sir William Thomson, Sir Henry Barkly, Sir James Paget, Sir George Paget, Sir Henry Roscoe, Sir James Douglass, General Sir Beauchamp Walker, Sir John Lubbock, Sir Henry Rawlinson, Sir William Bowman, Sir F. Burton, Sir Frederick Abel, Archdeacon Farrar, Mr. Calderon, R.A., Professor Storey-Maskelyne, M.P., Professor Norman Lockyer, Sir George Baden-Powell, Mr. W. H. Preece, Sir R. E. Welby, Sir Benjamin Baker, Mr. G. A. Spottiswoode, Sir William Savory, Sir Frederick Bramwell, Mr. Moulton, Q.C., Dr. J. H. Gladstone, Sir Charles Wilson, Mr. H. H. Johnston, Sir Frederick Pollock, Professor and Mrs. Sidgwick, Dr. Quain, Rev. J. R. Diggle, Dr. Ogle, Mrs. W. K. Clifford, Miss M. Shaw-Lefevre, Miss Kensington, Miss Clough, Miss Sellars, and Lady Ashburton.

Mr. W. B. Croft, M.A., exhibited some breath figures, showing that polished surfaces placed near to bodies in low relief often take an impression of the detail, which is made visible by breathing upon the surface. The period of exposure varies in different circumstances.

Mr. Croft says :—"1. A coin is lightly pressed on a freshly split surface of mica for thirty seconds ; the mica takes a breath figure of the detail of the coin. 2. Paper printed upon one side has lain for ten hours between two plates of glass ; the print appears in white letters on both. Part of this phenomenon, although not with print, was noticed by Möser in 1840. 3. Sometimes the print appears in black letters ; the same impression may change from white to black. 4. Coins are put on the two sides of a piece of glass and electrified for two minutes ; each side has a perfect impression of that side of the coin which faced it. An electrotype plate may be reproduced in a similar way. These effects were partly indicated by Karsten in 1840. 5. An electric spark is sent across glass. Five superposed bands appear, black and white, of decreasing breadths, as well as three permanent scars. Riess, 1840. 6. The mieroseope shows water particles over the whole surface, larger or smaller as the effect is black or white."

A strong point of interest in these breath figures, from a photographic point of view, is that they are liable to something resembling "over-exposure" when the electrical action is continued too long, for then the image is entirely or nearly obliterated. Upon suitably rubbing the plates, however, the image comes out, as if the rubbing had removed some film ; in this latter respect there is as yet no parallel in photography, so far as we know, although, when church windows are "overdone" and rich in fog and halation, rubbing down the surface of the negative with turpentine will usually bring pictorial details into view. A still stronger point of interest about the breath figures is, that sometimes reversed images are obtained ; sometimes the image will come out as a positive, sometimes as a negative, and Mr. Croft tells us that he does not know the conditions governing the reversal. These phenomena too much resemble some of those familiar in photography not to make it reasonable to suppose that they bear some relation to each other. From a theoretical point of view, they are of interest ; in the case of breath figures, at all events, the image is not reversed by liberated bromine.

The breath images are sometimes full of exquisitely sharp detail, and they are somewhat stable, for Mr. Croft keeps them stored in plate boxes, like those for negatives, and they do not seem to fade. Dipping the plates in water and wiping them with a cloth smudges the images, but does not remove them. They can, however, be removed by rubbing the plate hard with damp leather.

To get a breath image of a coin, the following method is adopted :—A piece of patent plate glass is taken and washed, and wiped clean ; such perfect cleaning as usual in photography is not necessary. Another sheet of glass is taken and laid upon the table ; a slip of tinfoil is then laid on the sheet, then comes the piece of clean glass, and the coin on the top of all. One conductor of a Wimshurst electrical machine is connected with the coin, and the other conductor with the strip of tinfoil between the glasses ; the machine is then turned for two minutes. The glass discs of the machine are fifteen inches in diameter, and are turned at the rate of about one revolution per second. The poles of the machine are arranged at the sparking-distance of about half an inch, as a safe-guard against the electrification of the coin being overdone.

Breath images are sometimes obtained simply by taking a piece of paper printed on one side, and leaving it for some hours between two sheets of patent plate glass.

Möser, Hunt, and others made many experiments on this subject in the days of old, and Karsten found that, on suitably electrifying a coin on the top of a pile of plates of glass, he could get an image of the coin on every plate, and always on its upper surface.

Professor J. Norman Lockyer, F.R.S., exhibited, by means of the lantern, photographs of a number of Grecian, Egyptian, and other temples, including some of those of Thebes, taken by Captain Abney. Mr. Lockyer pointed out to the assembled company that many of these temples pointed east and west, and were open at the ends, so that the rising or the setting sun could stream through each temple, and illuminate the *sanctum sanctorum* at the other end ; the temples, therefore, are like horizontal telescopic tubes, with a collimating axis. To show that this idea is worth considering, he pointed out how a king's palace and a second structure near a temple both had openings which would permit the passage of the rays of the sun through the two buildings, and then through the great temple of the sun god, Ra, "The Lord of the Two Horizons," a title which has more meaning to the astronomer than to the archæologist. This idea of Mr. Lockyer's we therefore think to have more to support it than some of the numerous speculations about sun gods. A pamphlet has been issued, purporting to be written a thousand years hence, satisfactorily proving to our descendants that the present Professor Max Muller of Oxford has no existence, but is a sun god, a solar myth. Professor Lockyer is a

kind of sun god in his way, for has not a celebrated ballad described him as the "owner of all the corona?"

Dr. H. P. Bowditch exhibited some specimens of American composite photography.

Mr. Gambier Bolton exhibited some lantern pictures of animal and bird studies photographed from life. These studies were the result of eighteen years' photography at home and abroad, and they include slides of the newly discovered zebra (*equus greevi*, stuffed), and Mr. Yorke's photograph of the quagga, from life. Mr. Bolton told the assembled listeners that he believed the latter to be the only photograph of the quagga in existence; it was taken but a few months before the death of the animal. The peculiarity of Mr. Bolton's photographs was that they were taken by long exposures—that is to say, exposures of one or two seconds' duration—in order to avoid the harsh shadows incidental to instantaneous photographs taken in direct sunlight. Among the photographs was one of the green monkey, as well as of several other rare beasts. From its restlessness, he found the leopard the most troublesome animal to photograph, and nervous dogs with long, flapping ears caused difficulty.

Some admirable platinotype photographs by Mrs. F. W. H. Myers were on view; they displayed refined artistic taste, and good technical skill. Several of them were portraits of public celebrities, including Bret Harte; the others were chiefly character portraits. One of the best of them represented two cherubs.

The Royal Meteorological Society exhibited some tornado photographs. Among others, there were fourteen photographs showing the devastation caused by the tornado at Rochester, Minnesota, U.S., on August 21st, 1883. The great force of the wind in the tornado was illustrated in a very striking manner by two of the photographs, as one shows a horse impaled by a large branch of a tree, and another shows pieces of straw driven end-on into the bark of trees. There were two photographs of a tornado cloud taken at Jamestown, Dakota, U.S., June 6th, 1887. The cloud funnel was twelve miles to the north. The Society also exhibited a photograph of a tornado cloud taken in the storm on June 22nd, 1888, showing the spiral-shaped funnel trailing at a considerable altitude in the air at the other side of a lake, New Hampshire, U.S.

Professor H. Marshall Ward, M.A., F.R.S., exhibited a selection of transparent photographs, showing (1) various trees and plants from different parts of the world, including European oak, beech, spruce, the Indian banyan, palm and bamboos from Ceylon, and Californian pine; (2) illustrating the microscopic characters of some important timbers, such as are employed for determining their nature; also various details in the anatomy of healthy wood generally; (3) a selection of photographs of diseased oak and spruce, showing how different are the symptoms exhibited by the same timber when attacked by different fungi. Illustrations of several destructive fungi were on view, and some details of their action given. As an example of the uses to which photography may be utilised in forestry, we append a list of those transparencies exhibited by Mr. Ward which relate to the diseases of timber and plants caused by fungi:—

A block of the wood of oak destroyed by *Thelephora Perdix*. A similar block of oak destroyed in a very different way by *Polyporus dryadeus*. A similar block, also oak, showing the again different mode of destruction due to *Polyporus sulphureus*. Transverse section of a branch of oak destroyed by *Polyporus sulphureus*; the light parts are filled with mycelium. Longitudinal section of wood of oak destroyed by *Telephora Perdix*. The cavities of vessels, &c., are filled with fungus hyphæ, which pierce the walls and dissolve them by means of soluble ferments (*enzymes*), reducing the structure to a friable or rotting mass. Very highly magnified. A block of spruce destroyed by *Polyporus mollis*. A similar block, also spruce, showing the very characteristic and different mode of destruction due to *Trametes radiciperda*. Stump of a young tree attacked by *Agaricus melleus*, a destructive parasite. Portion of bark of a tree bearing fructifications of *Polyporus sulphureus*, a destructive parasite. Portion of branch of beech attacked by *Nectria ditissima*, one of the fungi which causes "canker." Specimens of wood suffering from "dry-rot," due to the ravages of *Merulius lacrymans*. A withered leaf covered with "mould," one of which (*Botrytis*) is capable of parasitic existence on living plants of various kinds.

Mr. Isaac Roberts, F.R.S., exhibited sixteen original photographs of stars, nebulæ, and clusters, including five photographs of the Great Nebula in Orion, namely:—1. A negative with five consecutive exposures, each of 5 seconds, 30 seconds, 1 minute, 3 minutes, and 6 minutes respectively, showing the stars in the trapezium, and the progressive photographic development of the nebulosity around them. 2. A negative showing the appearance of the nebula, with an exposure of 15 minutes. 3. A negative showing the nebula, with an exposure of 81 minutes. The third nebula (H 1,180) is also shown on this plate. 4. A negative with an exposure of 205 minutes, showing great extensions of the nebulosity, and that the nebula (H 1,180) is connected with the Great Nebula. 5. A negative with dual exposures, and an interval of five days between them, illustrating a method for detecting variable stars of short period. The suspected variables were indicated by circles drawn around them. He also exhibited:—6. A negative of stars in the constellation Cygnus, showing more than 16,000 stars on four square degrees of the sky, with an exposure of 1 hour. 7. A negative of the nebulæ (81 and 82 Messier), and a nebulous star in Ursa Major. 8. The Spiral Nebula (51 Messier) in Canes Venatici. 9. The Dumb-bell Nebula (27 Messier) in Vulpecula. 10. The Ring Nebula (57 Messier) in Lyra. 11. The Globular cluster (13 Messier) in Hercules. 12. The Great Nebula in Andromeder. 13. Nebulæ in the Pleiades. 14. The double cluster in the sword handle of Perseus. Remarkable groupings amongst the stars are also shown. 15. The minor planet Sappho on the 30th December, 1886. The trail of the planet during 60 minutes was shown within the circle drawn around it. 16. The minor planet Sappho on the 7th January, 1887. The trail is within the circle, and, by comparing its positions on the two photographs, the distance it has moved during seven days can be measured.

Mr. Edward Bidwell again exhibited some photographs and models of the eggs of the great auk, but in somewhat larger number than at the last *conversazione* of the Royal Society, as published in these pages at the time. The prints measured 6 by 4 inches, and were upon bromide paper; they were executed by Mr. Kidd, who had been engaged to travel with Mr. Bidwell over a large part of Europe for the purpose.

The great auk, or garefowl, formerly existed in large numbers on the coast of Newfoundland, from which country, and from the rocky islets off Iceland, most of the birds and eggs now in collections were obtained. In consequence of the quantities killed for food by the English and French fishermen, the bird was exterminated in its American home early in this century, but it survived in

Europe until 1844. There are 77 recorded specimens of the great auk, 14 skeletons (fairly perfect), and 67 eggs. The collection of photographs exhibited consisted of two views each of 55 of the eggs, photographed to scale. The models were cast in moulds taken direct from the eggs.

THE COSTUME ALBUM.

THAT the ablest and best of human endeavours are too often misunderstood and maligned is a truth so trite and obvious as to require little illustration. Whether it be from envy, which, like a shadow, pursues merit and proves it substantial; or from ignorance, which is unable to comprehend desert; or from indifference or laziness, which is too idle to look for it, some of the greatest benefactors of humanity have been suffered to languish in obscurity, or have met that which is worse, the exasperating destiny of ridicule and reproach.

These reflections are likely to be aroused in the deliberative mind by the Costume Album, which has been laughed at by the superficial as the "latest of American notions," and nothing more. It has been regarded simply as a pretty picture book, instead of a collection of moral memoranda, as it really is, and its author, no doubt, intended it to be, and its untoward fate in this respect recalls in a remarkable manner that of a great work with a somewhat similar ethical purpose, an abortive birth of some fifty years ago.

That "virtue should supersede crime and establish peace and harmony on earth" is, it will be generally allowed, something devoutly to be wished. How this desire may be accomplished was discovered by an author of the name of Thomas Wirgman, who published in 1837 a book entitled "The Grammar of the Five Senses," which he regarded as a first step in infant education. This infant education was also to be an universal education, and "established," in the author's words, "for ever." It was presented by him to the Bishop of London in the hope that the Bishop might cordially enter into its ideas, and suggest it as a text-book throughout the whole world. Moreover, severe scrutiny was invited for the detection of *one* single untenable proposition, for which a reward of ten pounds—who was to be the judge in the matter is not stated—was offered by the author.

This book, beginning with the five senses, illustrated by the simple notions of an umbrella, a tree, a drum, an apple, and a rose, proceeded incontinently in its second chapter to the metaphysical considerations of space and time. The volume was adapted to the childish intelligence by the aid of colours, in small parallelograms of about 1½ by ½ inch. Eternity appeared a pale arrangement in orange; Time was distinguished by a heavenly blue; pink dignified Conception and Understanding. The error of the great Aristotle was thus demonstrated to the infant, "for in his catalogue of ten notions he has introduced *quando* and *ubi*, thus converting the only two mental recipients into mental activities, viciating *(sic)* the whole science at its commencement, and frustrating his own laudable design." But, notwithstanding its condemnation of the Stagyrite, its attractive colours, and its author's estimate of its correctness, the Bishop of London seems to have treated it with disregard, and the Queen—to whom a special presentation copy was submitted—acquainted Mr. Thomas Wirgman that she could not entertain applications for its use to "really improve the state of education for the infant population," and coldly referred him to her confidential advisers for the future.

The American mind which conceived and brought forth the pregnant idea of a Costume Album has been as much misunderstood as the unlucky author of the "Grammar of the Five Senses." Already, indeed, has the shaft of ridicule been aimed at this elegant conception, and many imperfectly acquainted with its object have spoken of it with disparagement or vilification. It has been supposed to be merely a *Magasin de Modes*, a common fashion book, with this sole difference, that the person draped exists not in imagination but in reality. Were it nothing but this, it might, perhaps, deserve the obloquy with which it has been assailed, but its inventor beyond doubt aimed at something higher, intended some noble moral end far other than a mere idle gratification of the eye. We may conceive him to be a second Adam Smith, dealing with the influence of custom, and fashion, and association upon the moral sentiments.

In this way of thought a Costume Album may be regarded as a continual monitor, or a *vade mecum* of good advice. As, when a new fashion of dress comes in, the folly of the outgoing fashion is commonly perceived and insisted on, so many actions which the principle of association has connected with that dress are afterwards seen face to face in their naked deformity. The sentiments of conduct are, perhaps, as much influenced by fashion as the sentiments of beauty. As the dress of one time seems at another absurd, so also does the behaviour. What is to-day supposed to be elegant is pronounced hideous to-morrow; what is to-day regarded as good and worthy of approbation is denounced to-morrow as bad and morally indecent. Suppose, if an illustration be required, that a lady possesses in her Costume Album a photograph of an apparel which she had made or "confectioned" for the express purpose of beholding a bull fight at Seville, or of assisting at a pigeon shooting match at Hurlingham. The very next photograph in her collection represents her in the modest attire suitable for attendance at her own parish church, in which attire she prays devoutly to be delivered from the pomp and vanity of this wicked world. Surely a moral lesson will be conveyed to the most heedless and inattentive mind by such a pictorial juxtaposition. Surely the most bird-witted—without any reference to the pigeons at Hurlingham—woman will be thereby mentally benefitted.

Thus, the Costume Album will become a valuable diary of life's experiences, teaching her what to seek after and what to avoid. If we suppose the prices of her varied raiments to be added to them, after the fashion of a linen-draper's ticket, though the appearance of the photograph will be in no way bettered, yet what a valuable lesson in economy will hereby be gained!

The pigeon shooting attire, besides presenting a record of time used, to say the least of it, for no profitable or praiseworthy purpose, will, with its adventitious ornaments and wholly unnecessary elaboration, remind her who once wore it how great an expense was then thereby incurred; the parish church apparel, showing no immoderate outlay, and "quoted," to borrow a mercantile flower of expression, "at a modest figure," while it affects her with no pang of bygone extravagance, will, at the same time, cheer her heart and strengthen her future endeavour with a sense of an accomplished duty likely to bring about a temporal and eternal advantage. Again, the many changes of her

costume in a short season will remind her of the mutability of life, of the uncertainty of happiness, and of the nature of the only true good, unchanging, and eternal.

Here is a dress which she wore at that dinner party of A's, where a hired man, an alien to the profession of a footman, spilt a plate full of soup down her back. Then she thought she should have died with vexation and chagrin; now she wonders how such an accident could have affected her equanimity. Here is a ball dress with an infinitesimal irregularity of fit; she remembers what words she used to her dressmaker in regard to it with remorse and shame. Here, again, is the dress in which she showed that mean jealousy of her husband at that picnic at X's. How often has she since confessed to herself, while looking upon its representation in her Costume Album, that her anger was wholly idle, and misplaced, and foolish, inasmuch as it was within an ace of wrecking all her happiness in the future. And so against all the other evil passions of the mind—those harpies which prey upon the human heart—the Costume Album may act as a memorial and as a warning.

Not a dress in that book is without its own little history of good or evil, known probably to herself alone. So she may repair to this excellent volume, as to another "Pilgrim's Progress," in any spare moment of serious meditation, and see herself, as it were, in a looking-glass. Nor is the advantage to her alone. Finding the folly of envy, malice, hatred, and all uncharitableness so clearly recalled to her by her Costume Album, she will have the chance—and probably use it—of improving her own character, and thereby adding to the happiness of those around her. Nor is this even all. After she herself has passed away, her children may in their turn learn a lesson from her old Costume Album. Turning over its pages, from the gay sprightliness and vivacity of the dress of their mother's youth, to the grave and sedate sobriety of her apparel in old age, they will receive such moral instruction and benefit as could hardly be produced in them by any alien record, and their earliest thoughts of the vanity of the world, their first earnest conviction of the frail estate of human things, may be born in them by the inspection of this "latest of American photographic notions."

May the book long flourish which is fraught with such wholesome counsel, and meet not the unhappy fate of the book of Thomas Wirgman. It is truly sad to read the concluding words of his preface. "Should the reverse of this pleasing dream take place," says the author of the "Grammar of the Five Senses"—anticipating the possibility of its ill success—"should its writer still meet with the same apathy and indifference which have signalized the last forty years of his existence, his theory, together with his dialogues, must for ever die; unless, indeed, like the Pythagorean theory of the celestial bodies, after a lapse of many thousand years it should find another Copernicus to bring it into play." *Absit omen!*

The Photographic Convention.—Since our last issue, and up to the time of going to press, we have not received from the Photographic Convention a copy of the official programme, or any additional details as to the Chester meeting. From another source information comes that Mr. Friese Greene will exhibit one or more of the new cameras for taking a considerable number of photographs of moving objects per second, as well as one or two other interesting pieces of mechanism. The lantern machines for projecting the said photographs on a screen are at present defective, but are likely to be all right in a few weeks' time.

MR. TOOLE AMONG PHOTOGRAPHERS.

A subscriber has sent us a copy of the *Melbourne Argus* containing the following narrative. Says Mr. Toole:—

"I have to sit again for my photograph, and you may as well come along with me. Having my photograph taken always reminds me of one occasion when I was taking a stroll on Hampstead Heath with Beerbohm Tree. We met a little travelling photographer, who wanted us to have our pictures taken for sixpence each, frame included.

"'But I've never had my picture taken before,' I said, 'Does it hurt much?' 'Why, Lor' bless you! no,' he says, 'it's as easy as anythink. Just you stand steady, and I'll take yer in two minits.'

"'But I'm so nervous—you must let me hold my friend's hand, and you must take us together. What do you put that black cloth over your head for? Have you hurt yourself?'

"This necessitated his leaving off to explain to us the use of the black cloth, and by that time we told him we had become so nervous that he must promise not to look at us while we were being taken. The moment he turned his face and began counting, Tree and I made the most frightful grimaces imaginable at the camera. The man took out the negative, scrutinised it with a puzzled expression, and said, 'I can't make it out. Somethin's gone wrong—yer faces have come out like puddens, they're all over the shop. 'Ave another try, gents.' We had another 'try,' repeating our protests of nervousness, and inducing him to turn his head away. We contorted our faces worse than before, and you never saw such extraordinary productions in your life as those photographs. The man was very crestfallen, and we told him we did not think much of his machine, paid our money, and strolled on. Presently we were accosted by another photographer, who invited us to have our portraits taken.

"'How much?' we asked him, and when he quoted the same price as the first man, we said, 'Why, we have just had them taken by a fellow over there, and he only charged us twopence each, but we were not very well pleased with them, and have a mind to try you.'

"He looked furiously in the direction of the other man, and his temper did not improve when he came to examine the negative, because we went through exactly the same fooling as before. We paid, and left him with the very evident intention stamped on his countenance of going over to 'have it out' with his rival for underselling him, and thus ruining trade.

"Of course, we subsequently bestowed life annuities on both of these men.

We had now arrived at the photographer's, and followed Toole into the little office, the walls of which, as is usual with such places, were hung with every imaginable specimen of work done on the premises. Consequently, we were not prepared to see Toole lean over the counter and ask the young woman attendant if she could recommend him to any place in Melbourne where he could have his photograph taken. The girl stared at him, but there was such a look of humble and inquiring gravity in his face that she only smiled, and said he could have his likeness taken there.

"Yes," said Toole, in a deprecatingly considerate tone of voice, "but I shouldn't like to put you out, you know. Now, if you could tell me of some place where they make a business of it, I should be so much obliged."

The girl, repressing a tendency to laugh, for his manner was full of a pleading earnestness, assured him that they made a business of nothing else, and asked what style he would like to be taken in.

"Well," he answered thoughtfully, "I don't quite know, for I was never taken before, and I don't know which style hurts the most. I believe a group is the least painful form, so I think the three of us would like to be taken in a group."

"Well, now, here is a group. Would you like to be taken in this style?" and she handed him one of those remarkable pictures in which two young men stood bolt upright in the background, while three others were disposed at their feet in what are called picturesque attitudes, the whole five looking as

stiff and uncomfortable as disconcerted pickpockets. Toole gazed at this sadly for a few minutes, and plaintively remarked, "Oh, I see, it takes five to make a group; just you wait here a moment while I run down stairs and get a couple of men out of the street to make up the number, so we can be taken in a group," and he turned to go.

"No, no," said the girl, "there are five here; I havn't a group of three to show you, but three can be taken just as well as five."

"But wouldn't it be more painful with only three?" Toole asked innocently, but got no answer, for the girl dived behind a little screen, from which she presently emerged with a heightened colour, and said if we would please to step upstairs to the next floor but one, she would arrange everything through the speaking tube. Now, it is a bad thing to commence laughing when you are not quite certain of your power to stop, and I am sorry to say one of Mr. Toole's companions was in this case by the time we reached the first landing. This was occupied by a merchant's office, full of packing cases and samples, in which two or three clerks were working, while the man of business was seated at a little desk all by himself. With a hurried injunction of "Don't laugh," Toole preceded us straight into the room, and, addressing the man at the desk with a smile of cheerful serenity, said, "We have spoken to the young lady downstairs, and she arranged us through the speakiug tube. We want a group of three, please, as I understand it doesn't hurt more than five, and I hope you wont't keep us long, as I have an appointment."

I thought the man of busiuess would have fallen backwards out of his chair, but he recovered himself, and said, with a smile, "I think, sir, you are mistaken."

"Yes, we want to be taken," said Toole, pretending to be deaf. "Any style you think best, you know. I should like to arrange my hair first."

"I said, sir, I think you have made a mistake. If you want the photographer he is on the next flat."

"As flat as you like," Toole answered. "I've seen some of 'em raised, but I don't think it any improvement. You won't keep us more than ten minutes, will you?"

"You have come to the wrong office, sir," said the merchant, raising his voice. "What name did you want?"

"Oh, yes, we'll have a frame, if it's all the same price—not that I am particular to a shilling or two. Perhaps you can show us some specimens?" Toole's countenance was smiling amiability itself.

I felt my lips beginning to quiver when the merchant rose solemnly from his chair, leant on his knuckles across the desk, and proceeded to bawl directions how to find the studio upstairs to Toole, who listened intently with his glass in his eye and his hand to his ear. But I missed the termination of the scene, for our other friend was suddenly seized with a violet fit of something between a cough and a sneeze, which sounded so suspiciously like an uncontrollable outburst of laughter smothered in a handkerchief, that I was obliged to lead him out and thump him on the back. We heard the directions being shouted out—half the city might have heard them for that matter—and presently Toole joined us not a bit flustered, and quietly remarking that it appeared we had made a mistake, for the studio was on the floor above. As Mr. Toole's man had actually been there in the morning, and made an appointment for him with the photographer, no further pranks could be played there, and the sitting only occupying a few minutes, we again descended to the street.

The Photographic Club.—The subject for discussion on Wednesday, July 2nd, will be "Matt Surface Printing." July 9th, Report of Delegates to the Photographic Convention. Saturday, June 28th, outing at Pinner; tea at Queen's Head at 6.30.

The British Association.—This year the British Association meeting will be held at Leeds, and will begin on Wednesday, September 3rd, under the presidency of Sir Frederick Abel, C.B. The president of section A (Mathematical and Physical Science) will be Mr. J. W. L. Glaisher, F.R.S., who long since has achieved eminence as a mathematician, and is the son of Mr. James Glaisher, the president of the Photographic Society.

NEW SALTS EXHIBITING OPTICAL PHENOMENA.

Among the most extraordinary and beautiful optical phenomena presented by organic compounds, it would be difficult, or perhaps impossible, to find any rival in this respect to two new products lately obtained in the laboratory of a Viennese chemist, Dr. Edmund Morvan. Nothing similar has been seen hitherto, and it is expected that the careful study of the physical properties presented by these compounds may ultimately bring out new ideas with respect to our theories of light and colour.

The first of these is an organic compound of oxide of zirconium, and is named by its discoverer zircon-ethyl-methyl-phthalein. The other belongs also to the aromatic series, and is called monococyl-metadihydroxyl-benzol.

These compounds exhibit hitherto unknown properties of refraction and fluorescence. The former appears yellow by transmitted light, and green by reflected light—that is, it looks like a brilliant yellow liquid with a bright green fluorescence.* The latter appears violet and green under the same conditions.

The first-named compound shows a remote resemblance to the substance known for some time past as fluorescin, but is distinguished from it by its ready solubility in water, and also by the fact that when treated with nitrate of silver it yields a bright red precipitate of nitrate of zirconethyl. Under the influence of the electric current it presents most interesting features. In a very weak solution, in a small glass tube hermetically sealed and submitted to an electric current, it changes its colour to blood-red, and shows a light blue fluorescence; the latter, says Dr. Morvan, is due to zirconium. On afterwards breakiug the tube and neutralising with a minute quantity of ammonia, the substance resumes its original aspect and fluorescence.

A weak solution of the monococyl-metadihydroxy-benzol, placed in a hollow prism, refracts light strongly; on its spectrum beiug thrown upon a screen, both colours of the fluorescence disappear. The zircon compound behaves in a similar manner. Removing the white screen and collecting the coloured rays by means of a lens—the rays thus collected now forming a simple ray—the latter, on being conveyed through a common prism, is spread out again into a spectrum, in which not only the fluorescent colours are wanting, but also their complementary tints. These are certainly most interesting properties, such as have never before been noted in any substance. But there are many other wonderful properties to which we have no space to allude here.—*Burgoyne's Monthly Magazine.*

Patent Intelligence.

Applications for Letters Patent.

8,928. F. W. Branson, 2, East Parade, Leeds, "Cameras."—June 10th.

8,956. W. J. Radford, 17, Brunswick Street, Liverpool, "Improvements in Light Baskets for Carrying Light Articles."—June 11th.

9,058. J. C. Shenstone, 70, Chancery Lane, London, "Lamps for Photographic Enlargements."—June 11th.

9,118. H. H. Lake, 45, Southampton Buildings, London, "Photographic Apparatus." (Rudolf Krügener, Germany.)—June 12th.

9,158. C. H. Gale, 38, Scarsdale Villas, Kensington, London, "Adjustable Tripod."—June 13th.

9,208. G. T. Teasdale Buckell, "Printing in Colours."—June 14th.

9,218. F. W. Hayward, 23, Upper King Street, Norwich, "Colouring and Softening Photographs on Paper."—June 14th.

9,231. W. Milner, 11, Yerbury Road, Holloway, London, "Photographic Shutters."—June 14th.

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* Fluorescin, which also exhibits these optical phenomena, is abundantly soluble in a weak solution of ammonia.—Ed of P. N.

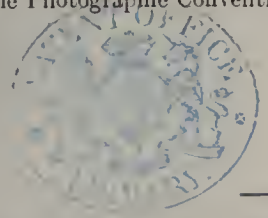
Correspondence.

FLANGE SCREWS OF PHOTOGRAPHIC LENSES.

Sir,—At some meetings of a sub-committee of the Photographic Convention, certain sizes were suggested as standards for the flange screws of photographic lenses.

We, the undersigned, who were present at the meeting, with every desire to assist in the settlement of this important question, were convinced that the sizes arranged would not be universally adopted by the leading manufacturers. We felt, however, quite confident that it would be possible to arrange a series of flanges which could be adopted by ourselves, to which we could arrange to make all our lenses in the future, and which should also be of such a character that the majority of lenses now in the market should screw into them.

We are making careful investigation into the matter, and we have gone quite far enough to see that we shall be able to adopt such a series of sizes. Several important considerations are being carefully considered, amongst which may be mentioned the absolute necessity of arranging a series of diameters which are in suitable ratio to the dimensions to which the lenses themselves must be made. In order, therefore, to obtain standards that will be in future adopted by the leading makers, we are carefully arranging a series of sizes to which we shall work in future, and which we shall submit for the careful consideration of the Photographic Society of Great Britain, and the Photographic Convention.



Ross & Co.,
J. H. Dallmeyer,
R. & J. Beck,
W. Wray,
Henry Crouch,
James Swift & Son.

THE CONVENTION VISIT TO OLD MORETON HALL.

Sir,—Many of your readers who propose visiting Old Moreton Hall during the Convention week will be greatly disappointed to find it undergoing a course of whitewash and tar. The creamy old plaster and woodwork are being daubed all over with glaring whitewash, and where the timbers and carvings come it is receiving a coat of tar on the top of that. I don't know if this piece of vandalism will be finished, and the scaffolding removed, in time for the Convention visits, but I thought it best to make known what is being done and what to expect. If the council can suggest some other of the fine old mansions with which the country abouuds as an alternative, it would be well. Richard Keene,

Dalby Cottage, Western Bank, Derby, June 14.

PASSING PHOTOGRAPHIC PLATES THROUGH FOREIGN CUSTOM HOUSES.

Sir,—About passing plates safely through foreign custom houses as well as our own. I have soaked off some safeguards from an old box. The plates should be in grooved wood boxes, with small squares of orange or ruby glass in the cover and bottom through which the officers can see that the boxes cannot contain cigars. I never had one opened.

Plaques photographiques. Si la boite est ouverte les plaques seront complètement perdues. Messieurs les officiers de la Douane sont priés d'avoir la bonté de regarder dans l'intérieur au travers des verres de couleur.

Vetri preparati per la fotografia. Se la casetta viene aperta i vetri sono intieramente rovinati. Si prega l'officiate della Dogana ad avere la bonta di osservare a traverso dei vetri colorati.

Photographic plates. If the box be opened the plates will be utterly ruined. The officers of the Custom House are begged to examine the inside through the coloured glass.

Those who take glass or films in ordinary card boxes must take also the consequences.

When will the dealers have the good sense to supply orange or red paper made adhesive for the repair of damage to boxes, camera-bellows, or tents, or for making a temporary changing place behind a farm window?

When will they have the sense to make grooving fit for modern sheet glass, with thin partitions, instead of going on for generations making grooves to take wet plates and plate glass?

For use abroad the boxes might be made much less in thickness to take each dozen. Now, four grooves go to an inch and an eighth. There ought to be six in that spacing. Compactness is tried for by grooves for ten plates each, back to back, a woeful business.

I have beautiful boxes made by Mr. Meagher for me to take abroad, with the partitions of vulcanite, I believe. But finer grooving might and ought to be made than the dealers give us still, and we put up with. J. J. Cole.

Mayland, Sutton, June 19th, 1890.

A PHOTOGRAPHIC SOCIETY IN CAMBERWELL.

Sir,—It has been suggested that a Photographic Society should be formed in Camberwell, and in furtherance of this a few amateurs residing in the neighbourhood have arranged to meet at the Stirling Castle Hotel, Church Street, on Wednesday, the 25th inst., to consider the matter.

With your usual courtesy, perhaps you will be able to find room in your valuable journal for the insertion of this letter, as no doubt some of your readers, amateur or professional, interested in the subject may be glad to know of the formation of such a society, and willing to promote it by attending the meeting. George C. Pike.

South Road, Camberwell, June 17th, 1890.

Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting on the 12th inst, Mr. H. M. Hastings occupied the chair.

Mr. S. G. B. Wollaston spoke about a method of development, using first eikonogen to get detail, and then following it with hydrokinone to obtain great density.

The Chairman exhibited some platinotype prints, and also some prints on Pizzighelli paper; the latter he considered to be better prints than he usually was able to get on this paper.

Mr. J. S. Teape showed prints from the same negative by four processes. Aristotype, cold bath platinotype, Pizzighelli, and albumenised papers were used. Aristotype was slow in printing, but for detail and gradation of tone he preferred it to either of the other processes he had used.

Mr. W. E. Debenham said that, having regard to the question under discussiou—the printing process that best registered the gradation of a negative—he was in favour of a glazed surface paper, such as albumenised or aristotype paper. The majority of the members present were of the same opinion.

A point was raised whether the printing process that best rendered the gradation of a negative gave the most artistic effect. This led to some discussion, in the course of which various views were expressed on the subject, but no definite decision resulted.

Hackney Photographic Society.

Mr. A. R. Dresser read a paper on "Hand-Cameras" on Thursday last, the President in the chair. There was a good show of hand-cameras.

Mr. Dresser, who has taken over fifty prizes, brought a number of enlargements, and considerable time was spent in examining them. In addition to the cameras, the lecturer showed one of his own construction fitted with a Voigtlander wide-angle lens, which he preferred almost to any other; it gave sharp pictures. He used a shutter with which he could get auy exposure up to $\frac{1}{300}$ of a secoud, and could, moreover, use either roll-holder or plates at will without any extra trouble. He had taken a jumping dog with it, and other things equally fast, without the least sign of motion on the part of the subject. For plates he had used Paget's and Fry's, but preferred the new films of Eastman's, which he found faster than any other for negatives.

Dr. GERARD SMITH, the president, spoke of lightning marks in the latter, but was assured by the representative present that this had now been overcome, and was a thing of the past.

A number of lantern slides was put through the lantern, illustrative of Mr. Dresser's work.

Mr. ABRAHAM showed his newly perfected hand-camera, fitted with a Taylor lens and focussing arrangement.

THE SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE annual excursion took place on the 11th inst. to Bolton Abbey and Woods. By invitation a goodly number of members of the Rotherham Photographic Society joined the train at Masbro', leaving Sheffield Midland Station in suitable weather for the taking of pictures. On comparing notes, it was found there were altogether fifteen cameras which had been used, and about one hundred and forty-five plates exposed, and ten Eastman's films. After tea, several plates were exposed on the members and friends.

THE NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

June 9th.—Mr. WALKER in the chair.

Mr. G. J. CLARKE delivered a lecture on "Photographic Optics," first speaking of the action of light when entering or leaving one medium of different density to the other, so as to make quite plain the reason of the action of lenses, and afterwards speaking of the defect incidental to different lenses, and the means by which they were overcome; he illustrated his remarks by means of well-drawn diagrams.

Mr. MCINTOSH wished to know if a stop placed behind as well as before a single combination lens would prevent distortion of marginal lines, and whether it would introduce other and more objectionable disadvantages.

The SECRETARY: Such an arrangement would prevent such distortion, but would cut off more than half the light, even with the largest stop, and with smaller ones the proportion would be much greater, besides which it would practically form a tube of the diameter of such stops, and of the length which separated them, thus allowing only a very small portion of the plate to be illuminated. As this would reduce the angle to a very small one, any picture taken with an ordinary landscape lens of the same angle would not show any distortion, and be free from the inconvenience.

Mr. GOODHEW: Would not sandwiching the new Jena glass, which is affected by the atmosphere, between two plates of other glass affect the optical properties?

Mr. CLARKE explained that allowances were made for such alteration.

On Monday, June 23rd, Mr. W. T. Goodhew will open a discussion on "Development."

LENSES.—A Correspondent of *The Beacon* (Chicago) says:—"My first portraits, and fairly good ones, too—I myself being the judge—were made with a lens ground from the bottom of a tumbler, and I have had landscapes in at least one exhibition taken with a 10-inch focus spectacle 'eye,' but, for all that, I generally carry a Gundlach and a Ross whenever I go out, and mean to add a Bausch and Lomb-Clark as soon as I can afford it."

BROTHERLY LOVE.—The Newcastle (England) Photographic Association sets a good example to societies generally in realising the beauty of the lines:

"Behold how good a thing it is,
And how becoming well,
Together such as brethren are
In unity to dwell."

Instead of the silly jealousy that too often obtains between the professional and the amateur, the members, mostly professionals, under the impression that the amateur was less able to pay his dues, resolved to reduce them by one-half for the purpose of bringing amateurs in in larger numbers. Is it any wonder, after this, that the Newcastle men are at the very top of the tree?—*The Beacon.*

Answers to Correspondents.

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

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

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

J. E. D. (Huddersfield).—*Mode of Publication.* You might send prints to Messrs. Marion and Co., Messrs. W. and D. Downey, or to Messrs. Waterlow and Sons, asking their terms for publication. If neither of these firms will undertake it, you could get them reproduced in collotype or Woodburytype, and make your own arrangements for sale. Prompt action is desirable.

A. W.—*Maignen's Softening Water Process.* We find two patents credited to P. A. Maignen, of London; the first is for "Improvements in Filters," dated December 14th, 1887, No. 17,220; the second is for "An Improved Automatic Separator," dated March 28th, 1888, No. 4,760. Neither of these makes reference to a process of *softening*, but solely to methods of filtration through asbestos cloth and a series of conical perforated vessels. It is, however, likely that the employment of lime could be conjoined with the filtration system, and so a general purification result.

C. E. E.—*Ferro-Prussiate Paper.* The address of a maker has been sent to you by post.

SENSITISED PAPER.—Since writing to you last week all the rest of the paper has been printed, toned, and fixed without any other result than that already reported. Three more prints received.

H. S. (Antwerp).—*Pinhole Photography.* The most recent formula is that of Lord Rayleigh, who read a paper on the subject at the Newcastle meeting of the British Association. (See report in the NEWS of September 20th last, page 611.) The apertures worked were one-sixteenth of an inch for 9-feet focus, and it was stated that with a focal length of 66 feet the hole might be as large as the pupil of the eye. You might also refer to "La Photographie sans Objectif," by Captain R. Colson (Paris: Gauthier-Villars, 1887), which has for a frontispiece a view of the Dome des Invalides, taken at a distance of 100 metres on a gelatino-bromide plate in twenty seconds, with an aperture of 0·3 millimetre, and focal length of camera 0·13 metre. Mr. George Davison's pinhole photographs, shown at the last year's Photographic Exhibition in Pall Mall, were eminently satisfactory.

S. W.—*Tower of London Inscriptions.* Mr. Wm. Brooks has himself answered your point in his letter to the NEWS, page 466. At the Crystal Palace Exhibition last year a very complete series of the Tower of London, including many of the wall inscriptions, was shown upon the screen during several evenings, and excited a good deal of interest. Although Mr. Brooks tells us that his pictures are not yet published, it is well to know where they could be procured in the event of a demand arising.

P. M.—*Photography in Colours.* This question has been pretty well threshed out of late, and the conclusion seems to be that a very protracted exposure is required, without the possibility as yet of transferring the results to paper. Nor have we conclusive evidence that the coloured impressions are permanent, or bear free exposure to light.

EDGBASTON.—*Acid Toning and Fixing Bath.* When alum and hypo are mixed together in solution there is a slow decomposition, resulting in the separation of free sulphur, to which the toning is chiefly due.

H. H. B.—*Aristotype Paper.* It is advisable to separate the toning and fixing processes. For toning, use the chloride of gold with excess of chloride of potassium and neutralised with chalk. Fix afterwards with hypo or sulphocyanide. See pages 196, 288, and 368 of present volume.

A. M. M.—Your letter received. It requires consideration, and we will write to you in the course of a few days.

J. G. M. and others received.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1660.—*June* 27, 1890.

CONTENTS.

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

LAST Monday evening the Photographic Convention began its 1890 meeting in the ancient city of Chester, and was warmly welcomed there by the Mayor, Mr. J. Salmon, and the Mayoress, who gave the visitors a reception in the Town Hall, and at the same time invited three or four hundred private guests to meet them. Floral decorations were profuse; the hospitality was upon no limited scale, and an official welcome was given by the Mayor in the assembly room in the building. Symptoms of pomp and state were visible, in the form of two doorkeepers, one bearing a sword given to the Corporation of Chester by Henry VII., and the other supporting a mace, or the mace supporting him. At the official welcome the Mayor said that it was his wish and intention to make an impression upon his Conventionalist visitors at that, their first visit to Chester, in order that they might have an opportunity of receiving them again. Mr. Andrew Pringle, the late President of the Convention, then resigned his office to Mr. C. H. Bothamley, and at the same time stated to the listeners that from his acquaintance, short as it had been, with the Mayor, and from what he had seen of his ability, business capacity, and hospitality, he was convinced that the inhabitants of Chester had acted most wisely in the election of the present chief magistrate of their city. The new President of the Convention then delivered his opening address, after which came a musical entertainment, in which Miss Annie Griffith, Miss Macdonald, Mr. Webster Williams, Mr. T. Muir, and others took part.

A display of photographs and photographic instruments was laid out in the Council Chamber, in which the chief feature of novelty was a costly and elaborate piece of photo-micrographic apparatus made by Mr. Swift by order of the Privy Council, and designed by Mr. Andrew Pringle; it was specially planned to secure freedom from vibration, and to give abundant means for adjustment. Of this instrument and some of the other apparatus we shall have more to say hereafter.

The visitors were highly pleased with their reception, and with the numerous photographic attractions of Chester. We asked the city surveyor how he managed to keep the mouldy old buildings from falling on the dwellers therein, and burying the latter in the ruins. He replied that he often had to condemn new houses, but not old ones, for jerry builders were unknown in early times; thus was this apparent marvel explained. He also informed us that some people in Chester had long had the idea which we mooted last week, that it would be well if there were a wide, clear space all round outside the old city walls, and that the houses of the new suburbs should not be built close up thereto; he added that one citizen was doing what he could, at his own expense, to improve the present state of things in the respect stated.

Last Tuesday morning there were excursions to Llangollen and to Moreton Old Hall; the latter was found to be under repair, and somewhat in the state described in a letter last week in these columns. The weather was fine, and the Llangollen party enjoyed their excursion over the hills exceedingly. In the evening the report of the Lens Standard Committee was read. Messrs. Dallmeyer and Beck gave data suggestive of an alternative or modified scheme, and the whole matter was referred back to the committee. There is a hope, and a somewhat prevalent opinion, that the opticians may come to some amicable and unanimous conclusion as the result of coming conferences.

On Tuesday evening, also, Mr. A. Haddon read a paper on "Lens Standards," and Mr. Gambier Bolton one upon "Animal Photography," in the course of which he projected upon the screen those pictures of wild beasts of which mention was made in these pages last week, in our description of the *conversazione* of the Royal Society. Among the photographs was one of the quagga, an animal now supposed to be extinct. Mr. Yorke took the negative long ago, and now will not part with it for love or money. Additional particulars will be found in the paper of Mr. Gambier Bolton, who is the delegate of the Camera Club to the Con

vention. Steps ought be taken to obtain a few of the the most indestructible and permanent positives possible from Mr. Yorke's negative. The quagga is an animal somewhat of the zebra type, but being heavier than the zebra, has been killed off first, as the area in which it lived with the lion and other carnivorous beasts became more limited by the extension of the bonndaries of civilisation. The unfortunate zebra will follow the quagga.

On Wednesday afternoon there was an excursion by steamboat up the river Dee to Eaton Hall, the seat of the Duke of Westminster, at which place some group photographs were taken. It rained throughout the whole trip; some of the excursionists were out in the rain in the stem of the little boat during the whole excursion, there and back; others were packed like sardines in the little cabin, in which also from fifteen to seventeen excursionists were obliged to stand up the whole time. A few tarpaulins, so disposed as to protect parts of the boat from rain, would have been a thoughtful precaution, if no better means were available.

On Wednesday morning the annual meeting of the Convention was held in the City Hall, and a regulation was made to increase the number of provincial members on the council. It was also settled that the next meeting of the Convention should be held in Bath, that is to say, the 1891 meeting. On Wednesday evening Mr. Andrew Pringle read a paper by Mr. P. H. Newman on "Imagining and Imaging;" this was followed by one by Mr. C. H. Bothamley on "Orthochromatic Photography with Rhodamine," and with another by Mr. Paul Lange on "Photography in Norway."

Yesterday, Thursday, the chief excursion was to Conway, under the guidance of the President of the Convention. Views of the exterior of Conway Castle were taken, and then of the inside, after which the whole party, including Mr. Pringle, the ex-president, and Mr. Ting Fan Chang, secretary to the Chinese Embassy, lunched at the Castle Hotel, a well-known home of art, belongiug to Miss Dutton, and containing antique furniture which once belonged to Louis Phillippe; also paintiugs by some of the best artists of modern times, and some rare specimens of Venetian glass. Mr. Briginshaw photographed the whole party at the luncheon table. Plas Mawr, an old mansion in Conway, built in the days of Edward I., was next visited, and photographs taken therein of Queen Elizabeth's room by Mr. Briginshaw and Mr. Watkins; the latter made use of his new exposure meter for the purpose. The annual exhibition of the Royal Cambrian Academy of Arts was going on in the building, and included paintings by Sir Frederick Leighton and others. Some of the grand old chimney pieces of Plas Mawr were draped for the purposes of the exhibition, so could not be photographed. The members of this excursion party returned by separate trains, as some would not leave at the appointed time to listen to the reading of papers at Chester in the evening.

PERCENTAGE OF FAILURES.

If all photographers were as careful to call attention to their spoilt plates as they are to their successes, we should be better able to appraise their capabilities than we are at present. We speak more particularly of outdoor work—for in a properly conducted studio, where the operator is able to guage his exposures to a nicety, and where a developer of definite and unvarying composition may be reasonably expected to bring about a certain result, spoilt plates are few and far between, although there must always be a percentage of failures—to please patrons and from other causes which are not altogether under the control of the worker.

With out-door work it is different. In one respect the worker of bygone days, with his cumbrous impedimenta and his wet plates, was better off than his successor of to-day. It was incumbent upon him to develop his plate immediately after exposure, and although this entailed the use of a dark-room or tent, and a druggist's shop full of chemicals, yet the trouble involved had the compensating advantage of informing him at once of his success or failure. If the former, he departed on his way rejoicing, and if the latter, another plate was collodionised there and then, and the exposure was repeated. There was also some satisfaction in the thought that he knew the history of his plate, for he had cleaned the glass, had possibly prepared his own collodion, and knew that the bath which he had so carefully compounded would not play him false. He knew, too, that a trifling error of exposure one way or the other could be readily corrected during development and intensification.

The modern dry-plate worker, on the other hand, has many pitfalls into which he is apt to fall unless he is constantly on the alert. He does not make his own plates—except in rare instances—but he knows that he can rely upon well-known brands for uniform excellence. In the early days of the gelatine process complaints of plates which frilled and displayed other disagreeable defects were rife, but these faults have almost entirely disappeared, and it is quite an exceptional thing to meet with a plate which does not give fair results. The only danger to which the purchaser is liable is that of meeting with a box of stale plates. This has once or twice occurred to us when we have purchased in country districts, where there is not as yet a large demand for such goods, but never when we have been able to obtain the plates direct from a London warehouse. Such plates tell their own tale by general insensitiveness, by mottling, and still more conclusively by the metallic stain which forms a border round their edges, and which is plainly seen after development by reflected light. It is true that the stain will give way to alcoholic treatment, or to a weak solution of the ferrideyanide reducer, but its presence is as the wrinkle of old age, which brings other troubles in its wake.

The pitfalls to which we have referred have not, however, to do with faulty plates, but are brought about generally by the carelessness or ignorance of the worker himself, and it is according to his success in

steering clear of them that his capacity may be gnaged. If it ever fell to our lot to choose a good worker from a number of applicants, we should not dream of submitting them to the ordinary ordeal of a competitive examination by means of written questions and answers. In spite of the universality of this custom, we are certain that it does not bring the best men to the front. Those with the best capacity for cramming, and who have the most retentive memories, are those who win, while the man with the creative brain, and who has power at his finger ends instead of book knowledge, is left far behind. Our plan would be to give each man a packet of, say, four dozen plates of a recognised brand, and to turn him loose with his camera in a certain district or county. He who produced from those plates the largest percentage of good negatives would be the man for us, supposing that in other respects he was not objectionable.

But what percentage of failures by the ordinary worker may be considered allowable, and to what causes are those failures mainly attributable? Most of our readers know by experience what it is to start on a photographic trip with several dozens of dry plates, with anticipations respecting those articles which are seldom realised. We pass by the common losses caused by injudicious exposure, for these faults are generally attributable to want of experience, and the remedy is obvious. Now and then an old hand is caught napping, and over-exposes a plate, not by error of judgment, but because he forgets to insert in the lens the particular diaphragm which he had intended to use. He will not fall into this error if he is careful to let the various operations of focussing, exposing, &c., follow in regular order, and more especially if he makes it a rule to examine the picture on the ground glass while the lens is provided with the same stop that is to be used for exposure. The experienced man will always do this, for he knows that he can judge of the exposure necessary far more accurately by examining the picture in this way, and noting the amount of illumination which it has, than he can by the best tables which were ever conceived or constructed.

Another accident by which a negative is often rendered useless occurs when it is necessary, in consequence of the position of the sun, to shade the lens. We are in favour of using a properly constructed shade for the lens under all circumstances, but usually the hat does duty for want of something better; and too often its rim will cause an unlooked-for eclipse of the upper part of the picture. The negative from which the greatest results were anticipated is generally the one which exhibits some vexatious freak of this kind, and the uninteresting one, which might be spared, remains perfect in every respect. Other accidents are in many cases due to the over-elaboration of construction which distinguishes modern cameras. Working with one of these instruments lately which was provided with every conceivable movement, we noticed that one or two of our pictures were quite out of focus, although we had taken every precaution to see that the image was sharply defined on the ground-glass previous to exposure. We traced the fault to the loosening of certain screws which control the to-and-fro movement of the back of the camera—a movement, by the way, which is never required except in the case of a lens of abnormally short focus. The mere act of drawing the shutter of the dark slide was sufficient to disturb the position of the camera-back, with the result described. A certain proportion of negatives are commonly lost by the superposition of one image on the top of another, by access of light during changing, and by entry of light through faulty cameras and dark slides. A small number are also lost by beginners who often forget to draw their shutters, and the plate remains unexposed. All these pitfalls assail the photographic worker, and he must be looked upon as uncommonly successful if his failures amount to as little as ten per cent. We know that there are numbers who will tell us that they never go wrong, and that if they take out with them fifty plates, they will bring back fifty faultless negatives. We have found that such boastful beings produce negatives which are faultless only in the eyes of their parent.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.*

PRESIDENTIAL ADDRESS BY C. H. BOTHAMLEY, F.I.C., F.C.S.

At our meeting last year we were celebrating the jubilee of the photographic negative, and my predecessor in this chair very fitly devoted the greater part of his address to a summary of the history of photography during the past fifty years. Although, as you will remember, that address had a somniferous effect on the delegate from the Leather Bellows Club, the rest of us listened with much interest to the admirable account of the rise and development of photography which was laid before us. The events of a year usually require much briefer treatment than the events of half a century, and a review of the progress of the past twelve months is unfortunately made easier by the fact that little, if anything, of first-rate importance has been done. No discoveries or inventions of far-reaching influence have startled the photographic world.

Much interest has been excited by the announcement that an Austrian, Herr Veresez, had made a decided step towards the solution of the problem of producing photographs in natural colours. It is understood that the method is based on Carey Lea's researches on the photo-compounds of silver, and that it differs from earlier methods in that the sensitive material is used in the form of an emulsion. How far the results are in advance of those obtained by previous experimenters is a point on which there are differences of opinion. It seems practically certain that, at any rate, some improvement has been made in the permanence of the images, and we shall look forward with much interest to the results of further experiments by the same worker.

This problem of photographing objects in their natural colours is of very great interest. It seems to be the one thing on which the non-photographic public has set its heart; nor are photographers lacking in enthusiasm. How far these desires are likely to be realised we cannot tell. More or less imperfect photographs in colours have often been obtained, but they are not capable of multiplication in the way in which we make hundreds of prints from one and the same negative. Whether we shall ever obtain a chromatic negative process is at present merely a matter of conjecture; we can only say that the direction in which the solution of the problem is to be looked for is not yet apparent.

In dealing with another difficulty—the proper monochro-

* Read at the Photographic Convention at Chester.

matic rendering of coloured objects—we have made much greater progress. No marked advance, however, has been made since last year, and the general adoption of orthochromatic methods is impeded by the facts that their successful employment, especially for outdoor work, necessitates certain modifications in well-established methods of working ; that the preparation of the plates involves some manipulative skill and acquaintance with the selective sensitisers to be used ; that it is not at all improbable that a sensitiser with a similar name, but of greatly inferior power, will be used unless great care is taken in purchasing the materials ; that the commercial products upon which many have to depend do not at present represent the maximum possibilities of the methods. Nor is this true only of this country. Examination of many reproductions of pictures shows that some Continental workers have not obtained complete mastery over the capabilities of the processes, even for the particular class of work in which their advantages were most quickly recognised. The whole question of colour, physical and physiological, scientific and artistic, is very complex and difficult. Accurate knowledge and conceptions are comparatively recent acquisitions, and it is therefore not surprising that in the practical treatment of its various problems progress is somewhat slow.

Development and developers have, as usual, attracted much attention. Eikonogen has gradually obtained a firm hold as a useful addition to our developing reagents, its special value lying in the fact that it enables us to obtain well-gradated negatives where other developers would be very liable to give excessively strong contrasts. It follows that in dealing with very short exposures eikonogen is of the greatest service. In portraiture also it gives very fine results.

Catechol or pyrocatechin has not been fully investigated, partly on account of its high price. Quite recently, however, Dr. W. H. Perkin, jun., has described a ready method of preparing it from guaiacol, an allied substance much lower in price. In this connection it is interesting to note that Colonel Waterhouse has recently shown that guaiacol itself is a developer, though it does not possess any exceptional powers.

One very important fact in connection with the principles of development has been established by Mr. Lyonel Clarke in the course of his elaborate experiments on different developers, and has been confirmed by later experiments of my own made for quite another purpose. It is, that the maximum sensitiveness that a plate will show—in other words, the maximum detail obtainable for a given exposure—is the same for all developers, and for all variations in the composition of one and the same developer. Different developers differ, however, very considerably in the time required to make the maximum detail visible, and it follows, of course, that the gradations of the resulting negatives are very different. That, in a word, is the nature of the difference between developers—a difference in gradation, and not in the maximum detail obtainable, provided that the action of the developer is continued for a sufficient length of time. Recent papers contributed to the Photographic Society by Abney, and to the Society of Chemical Industry by Hurter and Driffield, are worthy of careful study in connection with the question of development.

Photo-mechanical printing processes have made no remarkably new departure, but their applications continue to increase. Cheap illustrated papers, and a great increase in the number of the illustrations in magazines of all kinds, constitute unmistakeable evidence of the usefulness of these processes. Without photo-mechanical printing, a paper like the *Daily Graphic* would be impracticable.

Chromo-typogravure, which produces the fine results seen in *Figaro Illustré*, and chromo-collotype, which as yet is not often seen in this country, produce results in many respects superior to those of ordinary chromo-lithography. They are at present our furthest advance in the photographic production of coloured pictures. Colour printing with photogravure, I may perhaps remind you, will reproduce water-colour drawings with a fidelity so great that it may deceive even the artist of the original drawing.

The applications of photography to scientific purposes become every day more numerous and varied, and I do not hesitate to say that it is in this direction that photography has won, and probably will win, its greatest triumphs. Here it is without a rival or competitor, and does services which nothing else is capable of doing. As a method of fine art it occupies, and probably will always occupy, a subordinate position.

In no branch of science have the photographic results been of greater importance than in astronomy. Mr. Ainslie Common, encouraged by his great successes with his big three-foot reflector, has constructed and set up in his observatory at Ealing a magnificent five-foot reflector, in almost every respect the most powerful and most perfect telescope that has ever been made. It was designed and erected especially for photographic work, and its performances will be watched with great interest. You will, I am sure, share my pleasure in knowing that Mr. Common has very kindly promised to give us, at our meeting next year, an account of the later developments and results of astronomical photography. Mr. Isaac Roberts, with a much smaller reflector (twenty inches) at his private observatory at Maghull, near Liverpool, has produced some of the most remarkable photographs that have yet been done. Some of these I am fortunate enough to be able to show you, and I would especially call your attention to the wonderful photograph of the great nebula in the constellation Andromeda, which shows that in this nebula we have a new Saturn in the actual process of formation. The condensed central mass, and the system of long oval rings surrounding it, can be very clearly seen. Of the important bearing of this result on the nebular hypothesis I cannot here speak. It must be a source of great satisfaction to all photographers to know that Mr. Roberts's splendid work, like that of Mr. Common before him, has this month been awarded the blue ribbon of science—the Fellowship of the Royal Society.

A very remarkable recent result is Professor Pickering's discovery that a certain star is really a double star with its components too close together to be resolved by telescopes. The discovery was the result of observations on the variation in the definition of photographs of the spectrum of the star.

Mr. Andrew Pringle will tell us that photography has its triumphs in dealing with the minute as well as with the immense, and some of those triumphs he will bring before us during this meeting.

Amongst other things, photography has been largely and systematically applied to the study of lightning, and by Lieutenant R. Abercromby to the study of clouds and meteorology ; by Lord Rayleigh to the study of the effects of electrification on jets of liquid ; and by Mr. C. V. Boys to the investigation of falling drops of water. Mr. Friese Greene will describe to us a new form of magazine camera which he has invented, and which is especially suitable for investigations of the kind to which I have just referred. An account of Mr. Muybridge's work we heard from his own lips last year, and this year Mr. Gambier Bolton is to tell us of the results which he has obtained in applying photography to the study of animals from a different point of view. There is, in fact, no branch of natural science in which photography is not rapidly becoming indispensable.

If the applications of photography to science have been numerous and successful, the same cannot be said of the applications of science to photography. Most of the problems awaiting solution at our last meeting still remain unsolved. The careful experiments of Mr. Chapman Jones have given us accurate knowledge of some aspects of mercurial intensification, but of the real nature of the latent photographic image, of the change which silver compounds undergo when exposed to light, and of many other reactions which underlie some of our most important processes, we are still almost entirely ignorant. The reasons are not very far to seek. The investigators in these subjects throughout the whole world at the present time may almost be counted on the fingers. I say *investigators* designedly ; of experimenters of a certain kind we have enough and to spare, but of competent investigators there are very few indeed. The fundamental problems to which I have referred are very complex and difficult, and their investigation requires a knowledge of chemistry and physics much greater than is usually possessed by photographers, and, on the other hand, a

better practical acquaintance with photography than competent chemists and physicists usually have. Further, they involve many micro-chemical and electro-chemical changes with which we are at present imperfectly acquainted. In the less difficult questions of *technique* and processes, the relative merits of different modes of treatment and the like, we might have expected to find more satisfactory progress; but here also we have made no great advances. From time to time, it is true, papers appear in the journals recording so-called experimental investigations of the action of various developers, relative sensitiveness of different plates, and similar matters. In not a few instances they leave us just where we were. So far as the advancement of photography is concerned, they represent merely so much wasted time and wasted material—wasted because, for want of attention to some indispensable conditions, neglect to eliminate important sources of error, want of distinction between several possible causes, and the like, no definite conclusions can be drawn from the evidence offered. The enthusiasm of the experimenters is undoubted, and if a thirst for notoriety is not always invisible, we may take it that a desire to advance photography is their chief incentive. Why, then, do their efforts so often lead to nothing? Chiefly from a want of training in the art of experiment; from want of acquaintance with the scientific method. A really good experimenter is a rarity; an accurate observer must be both born and made, and is a still less common species. With very rare exceptions indeed, the scientific method, which includes not only the arts of experiment and observation, but also the power of properly co ordinating the facts, and of making accurate deductions from them, is only to be acquired by careful and long training. Such training, it is a mere truism to say, very few photographers have had, but to it we must undoubtedly look for our future progress.

I do not, of course, mean that good work cannot be done in photography unless a man has a profound acquaintance with chemistry and physics. I see before me a sufficient number of living examples to at once disprove any such assertion. The scientific method lies not in the matter, but in the manner. It would be out of place here to attempt any definitions or illustrations of what the scientific method really is. We might define it negatively as that which is usually absent in photographic experiments, but that would not take us much further. One of the most important characteristics of the scientific method is great reserve and caution in making deductions; one of the chief characteristics of not a few so-called photographic experimenters is a fatal facility for making hasty and incorrect deductions from imperfect data. No stronger proof can be found of the fact that photography is comparatively in its infancy, that its fundamental principles are not generally understood, than the rubbish which is sometimes brought before photographic societies in the form of papers—papers which even now and again escape the waste-paper baskets of the photographic journals. This latter catastrophe, of course, only happens when the editor is away on a holiday. Similar productions are characteristic of all crafts or arts which are still carried on largely by rule-of-thumb; they would not be tolerated in societies of a truly scientific character, or in an art which was really carried out on scientific principles.

Photography has an artistic as well as a scientific and technical side, and if I have not unnaturally dealt with the scientific questions first, I do not forget that the majority of photographers regard the artistic aspects as the more important. In the artistic development we may, I venture to think, congratulate ourselves upon steady and well-founded progress. Argument as to whether photography is or is not a method of fine art is no longer necessary. Its place has been taken by discussions, often of an animated kind, between the different schools of photographic artists—naturalisties, naturalists, realists, and the like. Very few who are competent to deal with the matter now refuse to admit that, in the hands of a man of artistic temperament and training, photography may be a method of pictorial fine art just as much as mezzotint or sepia. We shall all admit that the possession of a camera and lens will not make a man an artist; neither will the possession of a palette and a box of paints. It is also true that a very large majority of the photographs which we see are far from having any claim to be regarded as works of art, but is that not also true of the bulk of the paintings which are produced? Fine art, I take it, lies not in the method, but in the use of it; in all cases it is the man, not his medium of expression, that determines the result.

In 1873 Mr. P. G. Hammerton, the well-known art critic and editor of the *Portfolio*, very clearly and tersely summed up the case against the claims of photography to rank as a method of fine art. "(1) It is false in local colour, putting all the lights and darks of natural colouring out of tune. (2) It is false in light, not being able to make those subdivisions in the scale which are necessary to attain relative truth. (3) It is false in perspective, and consequently in proportions and forms. (4) Its literalness and incapacity for selection and emphasis are antagonistic to the artistic spirit."

Most of this was true enough seventeen years ago, but we have advanced a little in our knowledge of science and art since then. Falsity in local colour has almost disappeared before the development of orthochromatic methods, the principle of which was discovered in the very year in which Mr. Hammerton wrote. Falsity of light arises mainly from the use of plates of unsuitable quality, and from imperfect knowledge of exposure and development on the part of the operator. Falsity in perspective and the proportion of forms is entirely a question of the proper or improper use of lenses, and need not exist at all. Literalness and incapacity for selection and emphasis are defects in the photographer more than in photography. How far we have advanced in this direction I will bring to witness, if not Mr. Hammerton himself, at any rate Mr. Hammerton's paper. In the January number of this year, speaking of the photographs which illustrate Miss Agnes Giberne's book, "The Ocean of Air," the *Portfolio* says, "But what it concerns us to observe is, that though they are merely literal transcripts from nature, and no other artistic faculty than that of selection has been exercised in their production, this faculty alone has sufficed in several instances to produce genuine works of art. If an artist were to take, for instance, the "Trees in a Mist," photographed by Mr. Sutcliffe, of Whitby, it is not too much to say that he would find it difficult to improve the composition, or to alter a single line for the better."

In their assault on the fortress of art, photographers have already carried the barbican, and many may be found in the outer ward. A few have even forced their way into the inner court, but the keep remains in the hands of the painters and sculptors, and in their hands, I doubt not, it always will remain. Every method of fine art has its limitations, and in the case of photography these limitations are, in many respects, more severe than in any other method. I, for one, accept Mr. Ruskin's *dictum* that every true work of art shows distinctly the method by which it has been produced, and that its character and possibilities are largely determined by the method. I have little sympathy with those whose chief anxiety seems to be to make their photographs look like something else. I believe that if photography is to maintain the position it has already won, and is to make further advances as a method of fine art, we must not only be fully acquainted with and make the most of its capabilities, but we must also quite clearly recognize its limitations. We must be content to admit that there are certain classes of subjects which come rightly within the scope of the painter, but are unfit for treatment by photography. In our appreciation of a picture we cannot forget the method by which it has been produced; and when, for example, you see a photograph professedly of an incident which took place before photography was invented, the unreality and want of truth is too prominent. You are unable to rid your mind of the idea that, after all, it is only a literal representation of a group of models. When, too, we see photographs which profess to represent those human emotions which we commonly hold sacred from intrusion, a sense of unfitness more than counterbalances any pleasure arising out of mere technical artistic skill. All this has been pointed out before, more appropriately and with much greater force, by the *doyen* of photographic artists, Mr. H. P. Robinson. Latterly in America they have very largely

developed the practice of photographic competitions, prizes being given for the best set of photographs illustrating some poem or part of a poem or story; and to some extent the practice has, unfortunately, like the potato beetle, spread to this country. If the subjects are properly chosen, with due regard to time and place, such competitions may not do any harm, though it is contrary to experience to expect that any real fine art will be developed in such a manner; but when the outcome is photographs of such scenes as a girl in agony by the deathbed of her father, done, of course, with the help of models—to take only one example out of those which you may see in the American magazines—it is an outrage upon one's sense of the artistic fitness of things.

Even where groups of figure studies of the class to which I am referring are successful, the result is often due to the models quite as much as to the photographer. He has to be content with the best he can make of them; he cannot with his camera alter lines and expressions as a painter can with his brush. In the hands of a few masters, pictures of this kind are undoubtedly often successful; but in the greater number of instances they are not at all pleasing to anyone but the photographer and the models, and sometimes not even to the models. I hold that in the interests of photography as a method of fine art, it is to be regretted that photographers do not chiefly confine themselves to the classes and subjects that photography can deal with excellently, instead of striving after effects and results which, from the essential limitations of the method, are a severe strain on its capabilities. What class of subjects, you may ask, do I regard as proper to photography from the artistic point of view? I would reply, portraiture pure and simple, with studies of figures in costume, and groups, if you like, provided that they are put forward as such; landscape and seascape, in which figures are either subordinate or absent altogether. At the risk of making invidious distinctions, I would cite Wellington's "Eventide," Mayland's "There is Sorrow on the Sea," Gale's "Sleepy Hollow," many of the studies of Sutcliffe, and many of the landscapes of Green, as examples of the class of work which seem to me to show photography at its best. Someone may raise the old objection that in dealing with pure landscape and seascape you have not sufficient human interest; you can only represent the literal beauty of your subject, and have no opportunity for the idealisation which some hold, though others do not, to be essential to all fine art. I decline to accept the dogma; but, even if it were true, I would reply in the words of Fra Filippo Lippi:—

> "If you get simple beauty, and nought else,
> You get about the best thing God invents:
> That's somewhat; and you'll find the soul you have missed
> Within yourself when you return him thanks."

What can be done to promote the advance of photography, scientific and artistic? The development of a desire for better training, and the provision of means to satisfy the desire. Here, as in many educational matters, we are behind our Continental competitors. Germany has long had an efficient school at Berlin, under Professor H. W. Vogel, and there is a well-known school of a more technical character at Schloss Grönenbach, under the direction of Herr W. Crönenberg. Zurich has a new photographic laboratory full to overflowing. Austria has its new and splendid Photographic Institute, with abundant accommodation, and a large staff of teachers under the direction of Professor Eder, and they attract students not only from all parts of the Continent, but also from England and America. Here in this country we have the schools at the Polytechnic and the Birkbeck Institute, and in various science and University Colleges up and down the country instruction is given in the principles and practice of photography, but all of them together are scarcely equal to the Institute at Vienna, and they confine their attention almost exclusively to teaching, doing but little in the way of research. In America they are not even so well off as we are. So far as I can learn, there is only one school of any importance, that at Chatauqua, and I am informed on very good authority, that very little desire is shown to take advantage of the instruction offered, and that the school is only kept alive by the energy and self-denial of its teachers.

It has been proposed to found a Photographic Institute in this country, and we shall all be agreed that, founded on a right basis and conducted on right lines, it might be of incalculable benefit to photography. Founded on a right basis and conducted on right lines—that is the essence of the whole matter, so far as possible success is concerned. An Institute of Photography, I take it, should teach, and examine, and conduct original research. It might possibly also act as a court of arbitration in disputes involving technical matters, but the advancement of photography in all its branches and aspects, by teaching and research, should be its chief business. It should be thoroughly, though not ambitiously, equipped; it must be free from connection with commercial interests of any kind; above all, it must be free from the immaturism which so often clings round present-day amateurism.

Whether, when all these conditions were fulfilled, it would attract a satisfactory number of students, is a matter of conjecture. We English are slow to avail ourselves of our advantages in matters educational, even where the knowledge to be acquired has a direct monetary value. The experience of existing schools is not altogether encouraging, but the prestige which would attach from the beginning to a properly equipped institution especially devoted to photography would probably do much. The standard of every-day requirements in photography is gradually being raised, and there is little doubt that better instruction will be necessary to produce and maintain the higher degree of skill demanded. One thing is certain, that when the establishment of such an institution comes within the sphere of practical politics, the members of the Photographic Convention will not be backward in their support of it.

After all, the real progress of photography depends no more on institutes than the progress of civilisation and human knowledge depends on Acts of Parliament. The welfare of a community depends on the conduct and character of the individuals composing it; and the progress of an art or craft depends on the skill, the thoroughness, the enthusiasm of the individuals who practise it. We, as a Convention, are banded together to advance the interests of photography, and all that appertains thereto. As a Convention, we are endeavouring to justify our existence, and in some measure, at least, we are succeeding; but whatever we may do as a body, we have each an individual responsibility, an individual duty, towards the art which we practise—to see to it that our own work, be it much or be it little, is honest and thorough, the best that it is in us to do. Am I not right in holding that the spirit which should animate every follower of the photographic art is the spirit which inspired the poet when he wrote—

> "In after days, when grasses high
> O'er-top the stone where I shall lie,
> Though ill or well the world adjust
> My slender claim to honoured dust,
> I shall not question or reply.
>
> "I shall not see the morning sky;
> I shall not hear the night wind sigh;
> I shall be mute, as all men must,
> In after days!
>
> "But yet, now living, fain were I
> That some one then should testify,
> Saying—'He held his pen in trust
> To Art, not serving shame or lust'
> Will none?—Then let my memory die
> In after days!"

MESSRS. KEGAN PAUL, TRENCH, TRÜBNER, & Co., have published "Practical Notes on the Preparation of Drawings for Photographic Reproduction, with a Sketch of the Principal Photo-Mechanical Printing Processes," by Colonel J. Waterhouse, B.S.C., Assistant Surveyor-General, India. This work was originally published, it is said, in 1887 as a series of papers in the *Indian Engineer*, with the object of bringing together the results of long experience in preparing maps and plans for reproduction by photo-zincography; but the scope of the volume, which is divided into eight chapters, with an addendum, has been extended to include drawings of all kinds, supplemented by information gleaned from the few authors who have written on the subject.

PAINTINGS AT THE GOUPIL GALLERY, NEW BOND STREET.

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

Messrs. Bousson, Valadon, and Co. have now on view two series of paintings, both of which are of some peculiar interest to those concerning themselves with current art. The first is a set of water-colour drawings by Madeleine Lemaire, illustrating "Flirt," the latest novel by Paul Hervieu. The series comprises some thirty-six small pictures, separately framed, the chief feature being the semi-decorative floral border, which strongly reminds one of a certain style of photo-album. While admitting that the artist has executed these floral edgings in many cases with conspicuous skill, yet it is a question of some importance for artists of all sorts—including photographers—as to whether any such decorative work is, or is not, out of place around figure studies. Three larger pictures are free from this question. One of these three (No. 39, "Melancolie") and one of the smaller ones (No. 11, "Poste Restante") show how the artist can manage the play of light in and out the folds of crimson plush. As this is a material which presents some difficulties to the ordinary photographer, he would do well to study these two, and also look at many of the others, as they contain for him numerous hints as to the arrangement and pose of people in modern costume.*

The second series comprises thirty-one "oils by the veteran Russian artist, Ivan Aïvasovsky. It is interesting to know at the outset that all this series have been painted after the fifty-second anniversary of the artistic career of this artist celebrated at St. Petersburgh in 1887. Space does not permit much detailed criticism of the various paintings. The general impression conveyed by them is that they most probably represent climatic conditions which are exceptional, and outside the usual experience of English eyes. In several instances they remind one very strongly of some of the Norwegian and Swedish painters. Every one visiting this room will be struck with the large size of No. 10 ("The Supreme Moment"), a shipwreck scene in mid-ocean, with waves rolling mountains high," depicted on a canvas of Dorè-esque proportions. It has some fine colour passages; some of the water looks *very* wet, cold, and transparent, but without saying such mountain billows do not exist in extreme cases, it may be questioned whether those who ever have been in such peril as herein shown, would be sufficiently reliable evidence for the construction of such proportions as are admittedly of extremely rare occurrence.

In Nos. 11 ("Bather") and 17 ("Dead Calm") clouds are shown which, in this country, do not usually take that shape so near the horizon.

Nos. 19 ("Sea-Piece") and 21 ("Night Effect") gave an impression of a want of some stronger skylight with such vivid reflections.

The two skylights in No. 18 are rather puzzling.

Nos. 14 ("Argonauts") and 16 carry us into the region of speculation. In No. 14 the chief feature of interest is cut into by the frame. In No. 16 ("Destruction of Pompeii") the spotty lights in foreground and streaks in sky are painful reminders of defective emulsion. In No. 26 the sun, or full moon, whichever it may be, seems of an unusual shape.

One may often see the sun's disc when low down and near the horizon, apparently compressed vertically into a shape somewhat elliptical, but the sun in No. 26 does not seem to have been affected quite in this way.

All the pictures are, undoubtedly, well worth careful inspection, even if only to teach us English folk that our way of seeing and doing is not the only way—not even necessarily the best way.

* For an article on this artist, consult *Art and Letters*, December, 1888.

IMAGINING AND IMAGING.*

BY PHILIP H. NEWMAN.

I suppose it is pretty generally admitted now that photography, within certain well-defined limits, is a legitimate means of artistic expression, and in spite of mutterings and echoes heard from time to time to the contrary, statements that the various scientific processes by which light becomes an image maker, "only serve to degrade nature," are not seriously maintained in the face of demonstrations that such results, when they occur, are due to the want of ability on the part of the photographer, shown in the selection of his subject or the choice of his implements. A further proof of the alliance between fine art and photography is the increasing desire of photographic societies and conventions to leaven the purely scientific with the purely artistic, the materialism of lenses and chemicals with the emotional and the æsthetic. And here I may be permitted, perhaps, to acknowledge the great compliment that has been paid me in being asked to address you on these latter subjects. I am the more stimulated to do so, however, from feelings of gratitude as an artist for the benefits and assistance photography has conferred upon me. It has been argued that scientific studies and the exercise of optical and mechanical processes are not expected to be found side by side with that divine afflatus which should pervade the artistic nature—in a word, that photographers have no imagination. I can only conceive of this as a jest, and must treat it as such.

It is true, personally, I can only allude to my photographic capacity as of the humblest, although I have succeeded in imaging now and then all I have focussed, yet I am entitled to bear witness to a phenomenon of the dark room, which makes it at once a great school of imagination. I know of no exercise of imagination my mind has undergone equal to that experienced when developing a plate, as to how the latent image would turn out; and I will even confess, although I never thought to do so even to my bosom friend, in the dark room, that my imagination has begun to develop the image when no chemical formula would do it. I need not tell you, who have doubtless in your time undergone this hallucination, that no hypo would ever fix the picture. But to be serious, we have all of us imagination, and it will grow and bear good fruit if we will allow it, enriching the gardens of our minds, and making pleasant avenues for art to linger in. Our great danger is, undoubtedly, that science and dry fact will tend to dwarf and kill our imagination, especially if, moreover, we encourage that pernicious vice of looking at everything *only* through the camera.

Photography has been working amongst us, as Mr. P. H. Emerson says, "for fifty years for better or for worse," and I am afraid, if I believed in everything or much which he has written, I should have to admit "for worse." I should have to say to you to-day, gentlemen, when Daguerre addressed that meeting of the French Academy on the 19th of August, 1839, and showed it the hitherto fugitive image fixed in a picture of silver, he sounded the death knell of fine art; but I do not believe in all Mr. Emerson has written, and fine art is reprieved.

It is not my intention to drag you page by page in a review of the book I allude to—"Naturalistic Photography"—or that portion of it which relates directly to fine art, most of which you have, doubtless, read; I shall only have occasion to touch upon it here and there. My only reason for mentioning it at all is, that enthusiasm for one branch should be without prejudice to the whole tree. One aspect of fine art does not necessarily cover the entire field, though the solemn and authoritative *dicta* of this book would imply that it did. No-

* Read at the Photographic Convention at Chester.

thing that comes within Mr. Emerson's purview that is not naturalistic in art is to be tolerated, and unless you focus the subject, so to speak, with his lens you must be wrong. As tastes for ever vary without being necessarily bad, this contention is surely inartistic and illiberal.

In a chapter devoted to "Naturalism in Pictorial and Glyptic Art," Mr. Emerson careers through the schools, from Pharaoh in Egypt to Reynolds in Leicester Square, from China to Bouverie Street, from Japan to the Royal Academy; with the touch of a magician's wand, with the stroke of a pen, with a few dozen pages acutely sensitised to the true impressions of art at all periods, this book disposes of the whole question. The *cognoscenti* and the *savants*, the art critics of ancient and modern times, have indeed lived in vain; their writings, with little exception, can be shown by the fierce light of naturalism to be so much waste paper, that ought, of course, at the earliest opportunity, and in the eternal fitness of things, to crumble into dust—that dust which has been cast into the eyes of an hitherto misguided world. Mr. Emerson falls into ecstacies, however, over Egyptian lions, and discriminately tolerates some Assyrian ditto. Touching Greek art with a light hand, he points out with satisfaction that Appelles' greatness was due to his imitation of nature, and that previously Apollodorus was the first true painter, but "that the innovations made by him in the relation of foreground and background cannot be compared to the improvements effected by the Brothers Van Eyck in modern times." This is a far cry, and I dare say the Brothers Van Eyck and Appollodorus would be as astonished as we are at the comparison. Mr. Emerson recommends the frieze of the Parthenon to our notice, and lingers awhile among the Romans, admiring particularly the heads of Nero of Commodus in the British Museum. Riding his hobby of naturalism at a canter through Pagan times, he pulls up with the horse of Seleue, bowing his compliments to the Greeks for the height of their horizon, and whom, it is refreshing to find, he considers "very advanced."

We then find ourselves with Mr. Emerson loftily surveying early Christian art in a tolerant spirit; but he is very intolerant when art was tied and fettered by priestly domination in mediæval times, and he shall not be blamed, excepting that he does not dwell sufficiently on the protection the Church afforded art, and the loving naivty with which it was inspired. We will not follow him across China and the East, but watch him running *amok* against everything and everybody in the Renaissance who does not fulfil his standard of naturalism. Such men as Dürer get off by the skin of their teeth, and the only artists standing out as worthy of the greatest commendation are the Van Eycks and Holbein. Something, however, has to be said for Andrea del Sarto, but Michael Angelo, Raphael, and Corregio are swept away like chaff before the wind. Benvenuto Cellini, the author of the *Perseus*, is not recognised as a sculptor, but as a goldsmith, and as to Rubens and Vandyck, &c., the less said the better. Hogarth stands out among the English school of painters with Crome and Gainsborough, and perhaps Constable as an associate; but Reynolds, Turner, Nasmyth, Stanfield, Linnell, and Maclise go by the board. I will not weary you further, or twice kill the killed; it has been reserved for Mr. Emerson to convert the Temple of Fame into a slaughter-house, and I would rather he held the entire monopoly; but, as his book speaks so authoritatively on a subject with which you desire I shall have something to say, it is necessary for me to do something towards clearing the ground, and it shall be my task to show you where I consider are obvious mistakes.

Mr. Emerson's battle cry, or rather, his killing cry, is Nature! nature! nature! go to nature! Well, I am with him: we are all with him, being sane men; but *what* nature? He says the Greeks went to nature; many sculptors have told him so. Truly it needed not that; he might have evolved that from his inner consciousness, if he could not see it. How, then, *what* nature did they go to? Was it the nature of a labour-stunted physique, a brain-killed body, a factory-degenerated virility? Did they study arms from a sewing-machine girl, legs from a ballet dancer or a cyclist? Where would Mr. Emerson image his legs from to-day, even with the help of all the rectilinear lenses he possesses? Of course, I mean that the legs should be artistic legs, such as a Greek would have modelled. I think we should find Mr. Emerson rather at his wits' end if he had to draw such legs, unless he is well grounded in anatomy, or happened, by a fluke, to be visited by an exceptional model whom he could photograph. The general type of images of legs he could get would not come up to the standard of what Mr. Emerson's imagination would dictate, and I should not be surprised if, after all, we did not find him, having put the camera on one side, assisting his imagination by taking a look at that Elgin frieze we all so much admire; not to copy, oh, no! but just to see how the old fellows did it. Then, if he had to get a whole body, say a *Venus de Milo*, without a trace of stays, how then?

But I forgot Mr. Emerson cares for none of these things, but would rather have a peasant woman from nature than a Venus, Virgin, or Saint from imagination and cultured ideal. Well, there is no accounting for taste; but it is hard he will not permit the freedom in others he takes himself. There are still those equally earnest men in art who prefer the Saint, the Virgin, the Venus of ideal and refined culture to the peasant woman. By the way, I should like to know how Mr. Emerson is affected in relation to this subject by that exquisite remark of Balzac's.—"*L'une des gloires de la société c'est d'avoir crée la femme, là où la nature à fait une femelle.*" Freely translated: "One of the glories of society is, that it has created woman, where nature has only made a female." Surely, Mr. Emerson, the ideal is not so hopeless after all, and it is just possible that a great intellectual effort to attain an ideal on a reasonable substratum of nature might be partially successful, and not altogether Utopian; at least, even if for argument's sake we demolished the old masters to a man. Mr. Emerson should surely know it is no reproach to photography that though the camera can do much, it cannot do impossibilities; the intellectual effort in its use must, to a great extent, be subject to the model it focusses. You cannot make a silk purse out of a sow's ear in photography, much as you may do in that way in painting; but, on the other hand, are you always sure of making the best of the sow's ear as such? Not at all, unless you bring considerable artistic ability to bear upon the treatment of your subject; and when, instead of the sow's ear, you have, say, a very beautiful woman to photograph, the difficulty and the intellectual effort becomes infinitely greater, and you will be glad of some hints from Sir Joshua, to say nothing of Raphael and Rubens, besides Holbein, Titian, Gainsborough, and the favoured few Mr. Emerson tolerates.

(To be continued.)

Correspondence.

CENSURES ON PHOTOGRAPHIC DEALERS.

SIR,—Noticing several letters which have appeared in the pages of some of your contemporaries, conveying sweeping censures on photographic dealers, I deem it only just to state that, during a professional experience extending over thirty-seven years, save in one instance I have never met aught but the fairest treatment; and in this solitary exception the offender could scarcely be regarded as a dealer.

Mr. Otto Scholzig, whom I particularise, because he has been so distinctly mentioned, has satisfactorily supplied me with paper for several years, during which period I have but once had occasion to call attention to a faulty parcel, damaged perhaps through some lack of care in packing; it was at once replaced without a question—a practice I have invariably found to hold good with *all* other houses with whom I have had business transactions.

It affords me much pleasure to offer this unsolicited testimony to the fair and straightforward dealing of this large section of the photographic community, who are, in too many instances, blamed on very inadequate grounds.

Winwood, Tunbridge Wells, June 20th. WM. MAYLAND.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Stripping the Film of the Gelatine Negative—Unfavourable Opinions of the Aristo Paper—Toning Silver Bromide Transparencies on Opal Glass.

Stripping the Film of Gelatine Negatives.—There are several good methods of stripping the film of gelatine negatives, which may be used to produce reversed negatives for photo mechanical purposes, though I have always found that the process is of absolute certainty only in the case of the specially prepared gelatine plates of the trade. A method, however, with which I have repeatedly succeeded is the following, worked out by M. Charles Petit, professor of the renowned photographic reproduction establishment of Paris, and recommended of late by a well-known French amateur photographer, in the *Archiv*. The finished negative, after thorough washing and drying, is placed for ten minutes in a bath of 100 c.c. of water, 5 grammes of potassium or ammonium bichromate, and a few cubic centimetres of alcohol, allowed to drain, and dried in the dark. It is then exposed, at first from the glass side, for ten minutes in the sun, or forty-five minutes in diffused light, the gelatine film being covered during this operation by a black paper. Then the film side is exposed for a little shorter time. The plate is then washed in several changes of water until the latter remains clear, and dried. It is, however, necessary, in order to ensure success, that the gelatine film retain a certain degree of moisture, such as it would have acquired if it had been dried for twenty-four hours in a cellar. In order to strip the film, an incision is made in it by means of a sharp pen-knife about one-eighth of an inch distant all around the edges of the plate, then one corner is lifted, and the film carefully stripped. After stripping, the film is placed reversedly upon another glass plate of a little larger size than the film, in order to facilitate the operation; an expansion of the exposed bichromated gelatine film does not occur. This transferring process is done best by placing the glass plate on the bottom of a dish filled with clean water, and the reversed film upon the plate. The whole is then lifted and allowed to drain for a moment; to obtain perfect contact between film and glass, a piece of letter paper is placed on the glass, and the excessive water pressed out by means of the ball of the hand or of a squeegee. It is then put away for drying. The stripped film can, of course, also be used as negative film, and in this case, after the drying which follows the washing out the bichromate, a coating of plain collodion can be imparted to the gelatine surface, then a five per cent. gelatine solution to which some glycerine has been added. By this coating the bichromated gelatine film below, which is very fragile, is made more resistant. The stripping of the film is then done in the same way as described above.

Unfavourable Opinions of the Aristotype Paper.—It is a fact very often to be met with in daily life that the better a thing and the more successful it is, the greater is the number of the envions, who try to oppose it by all means. This is the case now with the aristotype paper, which, by all who have printed with it and judge it disinterestedly, is designed unanimously as the paper *par excellence* for amateurs. On the many advantages and merits of this paper has been written so much, that it would be needless to repeat it; be it sufficient to state that the number of its admirers and adherents grows from day to day. This, however, is by no means to the liking of some persons, who disregard all that they have not invented themselves, and who therefore search for defects and disadvantages of the material—in most cases, however, vainly. So to the aristotype paper the objection was made from the very beginning of its existence that the high gloss of the surface of the finished prints was inartistic and even offensive, and a German contemporary quite recently contained the following criticism: "The aristotype paper, with its uncertain tones, with its vulgar high gloss, and the faded details, is very seldom suited for artistic effects." If the writer of this judgment had ever seen the splendid and most artistic views of mountains printed on aristo paper by M. Vittorio Sella, of Biella, or the beautiful landscapes of Mr. Cronenberg, he would, perhaps, have altered his opinion. With regard to the glossy surface of the aristo prints, it is only necessary to remember that they can be produced as easily with a matt surface, by squeezing them on a ground glass plate instead of a plate glass or ferrotype plate. They are then very much like platinotype prints as regards the tone and the surface, with the difference, however, that their sharpness is much greater than that of platinotypes. Genre pictures and portraits are specially suitable for this treatment. Mr. Alfred Stieglitz, one of our most eminent amateurs, who had sent to the last Jubilee Exhibition at Berlin a large number of genre pictures printed on aristo paper and toned with the platinum toning bath, writes in Professor Eder's "Year-Book:" "A celebrated professor, one of the most bitter enemies of the aristo paper, asked me whether my pictures were printed on platinotype paper? And he was highly surprised when I answered, 'They are *aristo* prints, toned with platinum.' This example shows the small importance of such judgments, and for what reason they are published.

Toning Silver Bromide Transparencies on Opal Glass.—This process is, in general, not quite simple, because a sensitive silver bromide emulsion, after the reduction, *cannot* be toned directly. The ordinary gold baths are useless, since the reduced silver is too coarsely grained. It is, therefore, necessary to transform the picture at first into a silver chloride print. Dr. Miethe recommends for this purpose the following solution:—

Water...	1000 c.c.
Alum	20 grammes
Potassium bichromate	10 ,,
Hydrochloric acid	20 ,,

After a few minutes the print is well washed, exposed for about two minutes, and developed with the citrate developer. According to the time of exposure, the tone varies from red, through brown, to black.

A Fine Arts Exhibition is to be held at Poona in September next, when a money prize and two silver medals are to be offered for photography. Two out of the three judges for this section of the exhibition will be photographers.

The Bureau Scandinave, Brussels, has organised a photographic excursion to the west of Norway, to leave Rotterdam on Thursday, the 14th August. Arrangements have been made for the use of a dark room in each hotel at which the excursionists may stay.

Birmingham Photographic Society.—The first half-day excursion of the season to Coventry took place on Saturday last. Mr. F. W. Hardy, of the Coventry Society, accompanied the members to the principal architectural buildings of the city. The next excursion is fixed for July 12th.

Notes.

Usually the judging of competing photographs and the awarding of prizes in connection with an exhibition are looked upon as thankless and almost disagreeable operations. Where the task is performed by ladies the reverse seems to be the case; at least, so we learn from our lively contemporary, *Woman*, which states that "Mrs. Eveleen Myers (sister of Miss Dorothy Tennant), Miss Edith Scannell, and Miss Ida Vernon have just concluded the pleasant task of adjudicating on some 300 photographs by 'ladies only.'" If these ladies found their duty a "pleasant" one, and if the lady competitors are also satisfied with their verdict, we would suggest that Mrs. Myers, Miss Scanuell, and Miss Vernon be invited to assist the judges of the next exhibition in Pall Mall. Up to the present no exhibition year has passed over without some little heartburning on the part of someone. Perhaps the introduction of ladies might do away with all asperity. We ought not to forget, in connection with this subject, to mention that the 300 photographs alluded to formed the first Amateur Ladies' Photographic Competition, and that the first prize of a gold medal was awarded to Miss E. Dora Anderson.

One of the periodicals of the "Bit" class offers a prize for the best answer to the following question: "What are the best uses to which photography can be put?" There cannot be the slightest objection to the discussion of such an interesting question, but it must be confessed that the reason given for the wording of the question is puzzling. It is, so we read, put in the above form so that those who know nothing of photography may have an equal chance with those who are familiar with the art. One would have thought that in such a competition the latter would be first and the former nowhere; but perhaps the editor of the paper in question has some convincing proof of the contrary up his sleeve. If so, every photographer would much like to hear what it is.

Mr. P. O'Brien, M.P., is apparently quite convinced of the value of photography as a political argument. First, he secures with his own hand some photographs of the peculiar process known as "shadowing." Next he has copies of the pictures handed about in the House of Commons. Lastly, he has an optical lantern apparatus placed on a barge, which is anchored off the Houses of Parliament, and throws images of the said photographs on a screen for the delectation or otherwise of the members. The question is, what will be the next stage? Hitherto, the most singular discrepancies have been evident between the accounts given by Irish members who have been eye-witnesses of certain scenes, and the official versions furnished by the police. Will it come about in future, when Mr. Balfour traverses a statement, that he will be silenced by the triumphant production of a photograph of the scene in question? If so, and if the evidence of photography is valuable, then the Irish police will have to be furnished with instantaneous cameras, so that Mr. Balfour may be able to give an adequate rejoinder to the photographs of his opponents by producing the police picture. This kind of thing would, at all events, open up very interesting discussions, and give an opportunity for speaking to the photographic members of the House. Indeed, the freemasonry of photography, and the friendly feeling it fosters, might positively be beneficial, and considerably soften the acrimony of the debates on Irish questions.

Photography and the photographer have always been an irresistible source of fun to Mr. Toole. His interview with the Australian photographer, related last week in these pages, shows that he has not yet exhausted his joking propensities in this direction. Mr. Toole's recently published "Reminiscences" abound in allusions to his photographic experiences. Some of his pranks in the studio must have been extremely funny. He tells how, when he, Phelps, and Charles Mathews were playing "John Bull" at the Gaiety, they were photographed together for the *Illustrated London News*. The photographer was very much impressed with his work, and very anxious; and just as he had posed the group to his entire satisfaction, Phelps gave one of his little nervous coughs. Mathews remarked, "It's no good trying to get your tragedy cough into the picture, Phelps; it can't be done." They were photographed in character; Phelps had on one of his heavy tragic wigs, and Mathews one of his tall comedy hats. Just before the last pose the photographer suggested that Mr. Mathews should take off his hat. "It will make your face lighter," said he. Mathews, in his quick, merry way, taking off his hat, said, "Don't you think if Mr. Phelps took off his tragedy wig it would make *his* face lighter?"

At the last meeting of the Royal Astronomical Society Mr. Knobel gave an interesting account of a visit he had paid to Dr. Vogel's observatory at Potsdam. Referring to Dr. Vogel's new photographic telescope, just finished, Mr. Knobel said that, with the exception of the French telescope, this was, he believed, the first introduced for the photographic survey of the heavens which had been entirely completed. Mr. Knobel was also privileged to examine some photographs taken with this telescope, with one hour's exposure, of the Nebula of Orion. Incidentally, Mr. Knobel said that Dr. Schriener, who has been devoting much attention to the photographic magnitudes of stars, informed him of the conclusion at which he has arrived, that white stars require only one-tenth of the exposure of red stars to give the same photographic magnitude; it is, therefore, difficult to determine the magnitude of stars when they differ materially in colour.

The experiment tried by the *Pall Mall Gazette* of asking the frank opinion of the various artists whose pictures are reproduced in its publication, "Pictures of

1890" was a hazardous one, but on the whole it has come out of it fairly well. At the same time, it must be confessed that the remarks which find fault are more interesting to read than those which express satisfaction. We gather, for instance, that Mr. John Brett, A.R.A., knows something of photography, for he writes: "If you turn to page 37 I feel sure you will agree with me that the print is extremely weak. Not having seen the negative, I cannot with certainty indicate where the fault lies, but my opinion is that the negative was thin. . . . The printer has printed it with the utmost care, but a thin negative is past praying for." Mr. Colin Hunter is also dissatisfied. He is "sorry to say that my picture seems to have suffered more than usual in transferring it into black and white." Mr. C. N. Kennedy thinks his pictures are good "considering the badness of the photograph," but Mr. Yeend King, who sent a "particularly good" photograph, finds that his work has suffered through being over-reduced. Sir J. E. Millais misses his moon, which "up" in the painting has "gone behind a cloud" in the reproduction. Mr. W. B. Richmond is exceedingly candid when he says, "I should not be just to myself nor to you if I expressed a favourable opinion—I think they are very bad indeed." Mr. G. A. Storey observes that, "Considering that I sent you a very brown photo, I think my picture comes out very well," which is consolatory, though we should like to know what Mr. Storey means by a "brown photo." Mr. Walter Winch also lays blame on the unfortunate photographer, as "the reproduction is as good as it could be, considering the quality of the photograph."

Mr. E. J. Poynter unconsciously points out the cause, probably, of most of the dissatisfaction when he says, "I consider that the reproduction of the water-colour of the 'Queen of Sheba' is good, considering the difficulty which the colouring of the work presents to the photographer." Exactly! The colouring of many artists' work, notably that of Mr. John Brett, whose pictures have in them all the colours of the rainbow illuminated by the limelight, *does* present difficulties. To make a good copy of a painting requires special knowledge and special skill. Artists possibly do not recognise this, but think that anybody who has a camera can photograph a painting. If they want good printing reproductions, let them get the best photographs obtainable.

Manufacturers in all trades know that to be successful in business they must see that economy is practised in all departments, and many men owe their financial success to their care that nothing shall be used wastefully. But there is a limit to economy, as in all things, and it is sometimes difficult to avoid the temptation of overstepping the line. In the manufacture of dry plates this temptation takes the form of making a given quantity of gelatine emulsion spread itself over a larger surface of glass than is desirable, or of reducing the proportion of silver in the emulsion to the smallest possible quantity. The practice of this kind of economy is a suicidal policy, for although a certain number of amateur workers may be attracted at first by cheapness of production, they will soon learn that it is better to pay more for a better article. The difference of the results obtainable with a plate which is liberally coated, and that which is poor in emulsion, is enormous, and careful workers are not slow to find it out.

It is said that a Paris photographer claims that celluloid as applied to photographic films is a French invention, on the ground that in the spring of 1882 he showed some of these pellicles at a meeting of the Photographic Society of France. We have often heard that Frenchmen have claimed Waterloo as one of their victories, and their claim to celluloid is about as well founded. Celluloid was discovered by Parkes in this country more than forty years ago, and it was at once proposed to use it as a support for the photographic negative image; and it would have been so used had it not been for the circumstance that the solvents used in collodion acted upon it. An aqueous solution of gelatine has no such effect upon it, and, therefore, the idea has again been revived, and has at last taken practical shape.

Photography is very often allied with other occupations, and does good service in adding to the income of a man whose ordinary work is of a far different kind. This is commonly to be observed in out-of-the-way country towns where the population is not sufficient to support a photographer who depends entirely upon picture making for his living. An instance of this mixture of occupations we lighted upon the other day in an old-fashioned town in the heart of Sussex, where the only photographer in the place seemed to be a kind of Jack of all trades. First, he was a disciple of St. Crispin, and his work-bench was covered with old boots and shoes in various stages of completion. Next he was a taxidermist—and he told us that amateur naturalists for miles round sent him birds and beasts to be stuffed. Specimens of his skill in this way were hung upon all the walls of his shop. Then he was a beemaster, and he showed us two hives with their glass superstructures crammed with honey-comb. He also dealt in rabbits and other wild beasts, but his heart was evidently in his photography.

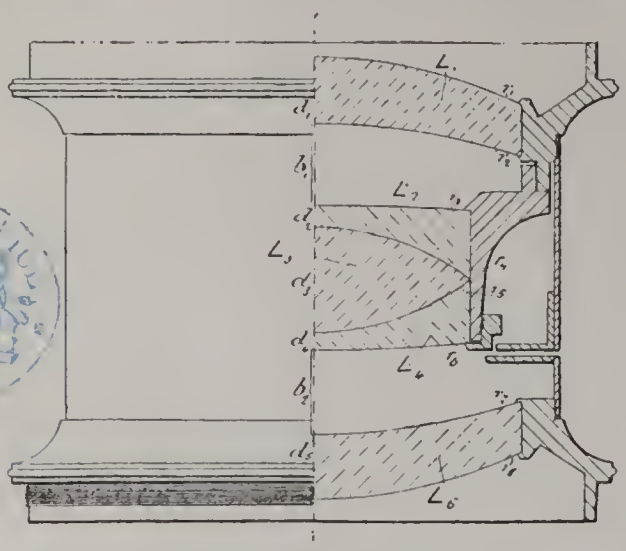
This humble worker had constructed his own studio, and all his own apparatus except his French half-plate portrait lens. One of the glasses of this lens he used for landscape purposes, and very good pictures he turned out with it of noted places in the neighbourhood. For these he found a ready sale, and the printing and toning of them give him continual occupation in the summer months. As we parted with him, we could not help thinking of the number of workers we have known who, possessing a battery of lenses and expensive apparatus of every kind, cannot produce pictures of equal merit to those which were lying amid the chips of leather and the stuffed birds in this worthy man's shop.

NEW PHOTOGRAPHIC OBJECTIVES.*

BY DR. ERNEST ABBE AND DR. PAUL RUDOLPH.

No. II.

In the annexed drawing, an objective carried out according to our invention is shown partly in outside view and partly in section. L_1 and L_5 are the two collecting-lenses, made in this case of concavo-convex form. The correcting-



system consists in the biconvex lens L_3, and the concavo-convex dispersing-lenses L_2 L_4, the two latter being composed of glass having such power of chromatic dispersion as is necessary to compensate the chromatic aberration of the lenses L_1, L_3, and L_5.

According to the kinds of glass used in the construction of the described objectives, and according to the special conditions to be realized by the total result obtainable from the system, a perfectly symmetrical arrangement of the lenses, such as is shown by the figure, may, in certain cases, suffice; in others, where a wider range of means for corrections or for removing objectionable reflections is desired, a dissymmetrical arrangement may be preferable.

In the following tables we append three numerical exemplifications of the manner in which lenses of given kinds of glass have to be ground for carrying our invention into operation. In these tables the letters r_1 r_2 r_3 r_4 r_5 r_6 r_7 r_8 denote the radii of curvature of the lens-surfaces marked by the said letters in the figure. d_1 d_2 d_3 d_4 d_5 are the central thicknesses of the lenses, and b_1 b_2 the respective air-distances between the lenses L_1 L_2, and L_4 L_5. All dimensions are expressed as fractions or multiples of the focal length of the entire system taken as unity. To obtain the dimensions of any particular objective, all that is necessary is to multiply the numerals given in the tables by the focal length required. The kinds of glass to which the tables refer are determined in the first example by the refractive indices n_D, n_F, and n_{G1}, corresponding to Fraunhofer's spectral lines D and F, and the line H_γ of the spectrum of hydrogen respectively, whereas in the second and third examples the indices n_D and n_F only are employed.

I.

Symmetrical arrangement. Apochromatic correction (the secondary spectrum removed).

Radii:	Thicknesses of glass and air-distances:
$r_1 = -r_8 = +0{\cdot}2574$	$d_1 = d_5 = 0{\cdot}034$
$r_2 = -r_7 = +0{\cdot}3847$	$d_2 = d_4 = 0{\cdot}011$
$r_3 = -r_6 = +2{\cdot}3040$	$d_3 = 0{\cdot}056$
$r_4 = -r_5 = +0{\cdot}1374$	$b_1 = b_2 = 0{\cdot}042$

Glasses employed:

	n_D	n_F	n_{G_1}
L_1 L_3 L_5:	1·51840	1·52457	1·52956
L_2 and L_4:	1·57950	1·58745	1·59388

Position of diaphragm close behind lens L_4.
Largest effective aperture: 0·16.
Angle of field: about 90°.

II.

Unsymmetrical arrangement. Achromatic correction.

Radii:	Thicknesses of glass and air-distances:
$r_1 = +0{\cdot}2473$	$d_1 = 0{\cdot}033$
$r_2 = +0{\cdot}3767$	$d_2 = 0{\cdot}010$
$r_3 = +2{\cdot}2000$	$d_3 = 0{\cdot}062$
$r_4 = +0{\cdot}1324$	$d_4 = 0\,011$
$r_5 = -0{\cdot}1452$	$d_5 = 0{\cdot}036$
$r_6 = -2{\cdot}4350$	$b_1 = 0{\cdot}041$
$r_7 = -0{\cdot}4272$	$b_2 = 0{\cdot}044$
$r_8 = -0{\cdot}2798$	

Glasses employed:

	n_D	n_{G_1}
L_1 L_3 L_5:	1·50932	1·52037
L_2 and L_4:	1·56808	1·58231

Position of diaphragm close behind lens L_4.
Largest effective aperture: 0·16.
Angle of field: about 90°.

III.

Symmetrical arrangement. Achromatic correction.

Radii:	Thicknesses of glass and air-distances:
$r_1 = -r_8 = 0{\cdot}4401$	$d_1 = d_5 = 0{\cdot}050$
$r_2 = -r_7 = 1{\cdot}3503$	$d_2 = d_4 = 0{\cdot}020$
$r_3 = -r_6 = \infty$	$d_3 = 0{\cdot}130$
$r_4 = -r_5 = 0{\cdot}2001$	$b_1 = b_2 = 0{\cdot}100$

Glasses employed:

	n_D	n_{G_1}
L_1 L_3 L_5:	1·51780	1·52901
L_2 and L_4:	1·56745	1·58233

Position of diaphragm close behind lens L_4.
Largest effective aperture: 0·30.
Angle of field: about 50.°*

PHOTOGRAVING ON SENSITIVE PAPER.—Mons. D. Stravos Zellis, of Alexandria, indicates a process which he has always found to succeed perfectly. Taking a sheet of thin white paper, he traces on it the title he wishes to photograve at the bottom of his negative, and oils it on both sides; having taken away the excess of oil by pressing it between two sheets of blotting-paper, he varnishes it again on both sides and leaves it to dry. He then cuts away at the foot of his negative a piece of gelatine equal in size to the prepared paper, and replaces it with this, sticking it on by means of a solution of gum-arabic and water. He then presses away the little bubbles of air which prevent its perfect adherence, and, this done, waits until his work dries. If, when taking a proof, it is seen that the written letters do not give a very white impression on the sensitive paper, it will be necessary to retouch the characters which come out badly on the reverse of the oiled paper. To write the titles, Mons. D. Stravos Zellis uses a mixture of gum-arabic, lamp black, and water. The process is simple, costs little, and gives excellent results.—*Annales Photographiques.*

* Continued from page 475.

* In the patent the inventors claim—"In a photographic objective, the combination of two single collecting-lenses, and a compound correcting-system composed of single lenses cemented together, the said correcting-system having a large focal length, and being placed between the collecting-lenses, substantially as described."—ED.

NOTES ON THE REPORT OF THE LENS STANDARD COMMITTEE.*

BY A. HADDON.

Before submitting the report drawn up by the Lens Standard Committee, I propose to state the history of this Committee, and the reasons for the recommendations at which it has arrived.

At the meeting of the Convention held in Birmingham, 1888, a committee of five members was appointed, at the suggestion of Mr. W. Taylor (Leicester), "to consider the adoption of the standard lens fittings recommended by the Photographic Society of Great Britain, or to suggest alterations of that system, and to take or indicate such steps as may be considered necessary for its effective establishment." The Committee thus appointed consisted of Messrs. A. Cowan, A. Gifford, A. Haddon, J. H. Pickard, and S. G. B. Wollaston.

That Committee met twice during the time which elapsed between the Birmingham and London meetings, and the Chairman (Mr. Wollaston) drew up a report, which was submitted to the Council, and it was decided that the same should be read at one of the evening meetings. After the reading of the report, Mr. W. Taylor proposed that the report be not adopted, but be referred back to the Committee for further consideration. Mr. Conrad Beck seconded the motion, which was carried.

At a meeting of the Council held in London on February 21st, 1890, the Committee was reappointed, consisting of Messrs. A. Cowan and A. Haddon (Mr. Wollaston having previously tendered his resignation as Chairman of the Committee), with power to add to their number. It was thought advisable to increase the number by adding to the list the names of three gentlemen well known to you—viz., Mr. W. Bedford, Dr. J. Edmunds, and Mr. H. M. Hastings, F.C.S.

We discussed the *pros* and *cons* of different methods, so as to formulate a system of standards which should be practical and popular, and as we had only the report of the Photographic Society of Great Britain to guide us, we thought it best to consult those gentlemen who are daily engaged in the superintendence of this kind of work. In addition to this, so as to ensure a meeting, a few of the leading opticians were called on personally, and their promise to attend obtained.

The Secretary of the Committee made a few remarks on the subject in hand, and then called for any suggestions that anyone present might wish to make.

Mr. W. Taylor (Leicester) opened the discussion, and, among other things, referred at some length to standard gauges to be used in connection with the screwing of lens mounts, and pointed out that, whatever system was finally adopted, it was necessary to seriously consider gauges, as, unless these were absolutely true and of the same size, to the ten-thousandth part of an inch, or even less, the resulting work could not be interchangeable. Mr. Taylor did not mean, as some seemed to have inferred, that the lens mounts themselves should all gauge to anything like the one ten-thousandth of an inch. It would be impracticable as a manufacturing operation to screw thousands of lens mounts to this degree of accuracy. Mr. Taylor than showed two sets of steel gauges, such as he had devised for his own factory, in order to ensure as near constancy as possible in the diameter of the screwed portions of mounts and flanges. He also mentioned that steel gauges for the smaller sizes of lenses did not last more than one year, in consequence of the slow but constant wear they underwent during their use. It was impossible to harden them, as during this operation they generally warped to such an extent as to become valueless. He had, however, partly overcome this difficulty by hardening certain removable pieces which could, after the operation, be replaced in exactly the same positions.

In connection with the standard unit for diaphragms, Mr. Dallmeyer suggested $f\text{-}\sqrt{10}$, and mentioned that at the recent Photographic Conference held in Paris $f/10$ had been adopted, so as to introduce the decimal system in connection with diaphragms. He considered his own suggestion better, as in order to obtain the intensity value of the stops it is necessary to square the denominator, and in his case it would only be necessary to strike off one nought, whilst if the French system were adopted two noughts would have to be struck off in order to obtain the unit area. Your Committee agree with Mr. Dallmeyer that the method he has suggested is extremely clear and thoroughly scientific, although there is much to be said for the powers of 2. If they were starting a system anew, they might well recommend Mr. Dallmeyer's suggestion for general adoption. But, as against this, they have to take into account the number of diaphragms that have been marked on the f-4 system, as recommended by the Photographic Society of Great Britain, and, therefore, think that it would be unwise to make an alteration now, more especially as the $f/4$ system is at present getting to be well understood and widely used.

Messrs. Debenham and Beck also spoke on this subject, and finally, when the question was put to the vote as to which of the three systems should be recommended for adoption, $f/4$ as the standard unit was carried by a large majority.

The next point for discussion which was raised resulted in a proposition from Mr. Dallmeyer, seconded by Mr. Beck, that a special meeting of opticians be called in order to settle the sizes of the screwed portions of lens-mounts and flanges.

The last subject that was brought before the meeting and voted upon on this occasion was screws for attaching cameras to tripods and for fixing rising fronts, &c. As nothing better was suggested than appears in the report of the Photographic Society of Great Britain, this was put to the vote and carried unanimously.

The meeting was then adjourned till the 9th of May.

Prior to the meeting of May the 9th, a circular was drawn up, and about two hundred copies posted to the different opticians whose names appear in the London Postal Directory. This circular embodied the different suggestions that had been made, and contained a copy of the resolution proposed by Mr. Dallmeyer and seconded by Mr. Beck. The response to this appeal for data was very meagre.

As the meeting of the 9th of May consisted almost exclusively of opticians, and was more or less of a private nature, we need not enter into details, but will only give the results arrived at.

On this occasion between ten and twelve opticians were present. Some data as regards diameters of the screwed portions of the mounts of lenses and numbers of threads to the inch were handed in for tabulation; but these data proved to be only approximate, no attempt having been made in any case to measure accurately the diameters, and the necessity for accurate guaging having been apparently not realised.

On discussing these results, it was found that the diameter of the smallest lens mount, where screwed to receive the flange, had been derived from an old guage prepared by Andrew Ross. This thread has been copied by several younger makers, and it is believed that some 100 to 120,000 lenses of this particular size have been manufactured and are now in use. Upon considering this state of things it was proposed that this size should be adopted in the future. This was carried unanimously. Mr. Dallmeyer thereupon very kindly offered to supply specifications as regards exact diameter, thread form, and thread rate for this screw, which was understood to be 1·5 inch in diameter.

The next larger size, 2 inches about, was then discussed, and for the same reasons as given above with regard to size No. 1, this was put to the vote, and carried by a majority (6 for, 2 against). Thereupon Mr. Dallmeyer promised to supply data for this screw also.

It was then proposed that the standards of the Photographic Society of Great Britain, with the above modifications, be accepted; this was lost by 3 voting for, 5 against the proposition.

The Photographic Society of Great Britain had kindly lent their standard gauges to one of the gentlemen present, and the gauges were upon the table for examination.

With regard to the form of screw to be adopted in connection with lens-mounts, it was proposed and carried that the thread form known as Whitworth should be adopted.

It was then proposed, seconded, and carried, that as the present was not a sufficiently large representative meeting, another meeting be called, and that all opticians be invited to

* Read at the Photographic Convention at Chester.

send in to the Secretary of the Committee exact measurements of lens mounts and flanges, with their thread rates for all the classes of lenses which they manufacture.

The meeting was then adjourned till the 21st of May.

As soon as possible a second circular was sent out to all opticians, as on the previous occasion, and as a result eight statements were received, and these were tabulated.

From the data thus tabulated, it appears that Messrs. Newton and Co., Reynolds and Co., Suter, Taylor, Taylor and Hobson, and the Stereoscopic Company, have been for some time past manufacturing lenses in accordance with the specifications of the Photographic Society of Great Britain.

The tabulated results also showed that what had been supposed by Mr. Dallmeyer to be 1·5-inch guage, and which had been adopted as one of the standards by the previous meeting, was in reality 1·513-inch. The screw which had been supposed to be a 2-inch also turned out to be 1·98-inch. It also appeared that there was some considerable divergence between these mounts and those issued by the younger houses, who had copied the Andrew Ross mount without access to the Andrew Ross gauge, and now manufactured these screws of such various dimensions that there was no certainty of interchangeability of these so-called 1·5 and 2-inch mounts, among some half dozen makers, who all considered they were making the same screws. Upon these facts becoming clear, the whole subject of the resolution which had been adopted at the last meeting had to be reopened.

In the discussion which followed, Dr. Edmunds was the first to speak—this being the third meeting—and he told those present that in considering standard screws they had three things to bear in mind: 1st, the diameter of the screw, and that in all cases this should be measured on the outside of the male screw, full diameter; 2nd, the form of the thread; and 3rd, the screw rate or pitch—*i.e.*, the number of threads to the inch; and that it was absolutely necessary to keep each one of these points separate and distinct. As regards the diameters of the screws, he would advise the English inch as the standard, as anyone who wishes to make standard gauges can easily turn up a ring or plug gauge, and then compare it with the standards kept by the Board of Trade for this purpose, and in that way ensure uniformity of manufacture and complete interchangeability. He would therefore most strongly advise any odd fractions of an inch that might occur in any of the sizes as at present manufactured to be abandoned, and the inch and simple submultiples, as $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, &c., to be taken in their stead. In olden times, before the screw-cutting lathe was invented, Mr. Holtzapffel originated certain forms of threads, and, though these at the time were as perfect as could be expected under the circumstances, yet now that we have a more scientific method for originating screws, we should use it and put aside these old forms. For brass work, where the maximum of strength is required, he had no hesitation in saying that an angle of 60° was preferable to any other, and that the top of the thread should be flat. The work could be turned down to the exact diameter, and then screwed up; if the original surface between the threads was left so as to form the flat when finished, the screw would be of the required diameter. The form of thread recommended by the late Sir Joseph Whitworth was an angle of 55°, rounded at the top and bottom. This form of thread could not be surpassed for cast iron, but was not the best for other metals where the greatest strength was required. The number of threads was not so important so that it was uniform.

In answer to these remarks of Dr. Edmunds, it was pointed out that a flat top thread, in the case of photographic lenses, would be more likely to bind if it were bruised, and therefore the rounded Whitworth angular form of thread would be preferable on this account. Shot chasers of the Whitworth form can be obtained all over the world from any respectable tool maker, whilst if an angle of 60° were adopted the chasers would have to be specially made, which would considerably increase the cost. Dr. Edmunds agreed that these were very good reasons why the Whitworth thread form should be adopted, especially as the maximum strength in the case of photographic lens mounts was not required.

It was then proposed and seconded that since, from the statements supplied, the diameters of the lens adopted at the last meeting were not exactly 1·5 and 2 inches respectively, but a small fraction larger in the one case and smaller in the other, those resolutions be rescinded in order to clear the way for further discussion and suggestions. This was put to the vote and carried.

It was then proposed that in all cases the English inch be taken as the unit of measurement. Carried unanimously.

It was then agreed that, in consequence of the difficulty of measuring internal diameters of flanges, &c., all terms of measurement be regarded as made upon the outside diameter of the male screw thread.

The next point discussed was whether the present smallest size of the Photographic Society of Great Britain standards, viz., 1·5 inch, was not too large for the mounting of lenses for hand-cameras. The majority were of opinion that it was, and that a smaller size was necessary, and finally it was agreed to start with the smallest diameter 1-inch, and the next 1·25 inch.

It was next proposed, seconded, and carried (by nine for, and five against) that 1·5, 1·75, and two inches be the next sizes, and that the others rise by half an inch up to four inches, and then by one inch, as prescribed by the Photographic Society of Great Britain.

It was then stated by some that certain lenses look overmounted with a mount of two inches in diameter, and, in addition, it would enable those opticians who have up to the present issued lenses a little over 1·5-inch to make adapters which could fit 1·75 inch without increasing to any serious extent the weight or bulk of the lens mount, and this new intermediate size would be very useful for the double purpose.

It was then unanimously agreed that the form of thread should be that known as the Whitworth angular thread.

The last matter to be settled was the rate or pitch, and it was agreed that for the smallest sizes up to 3 inches inclusive, the number of threads to the inch should be 24, and for the $3\frac{1}{2}$ and upwards, 12 to the inch, these being the two thread rates recommended by the Photographic Society of Great Britain.

Mr. W. Taylor (Leicester) then proposed a series of standard adapters to carry any lens one size larger, and that these should be numbered; also that lenses, adapters, and flanges should be so adjusted that when the mount is screwed home in its flange, with or without adapter, the diaphragm, index, or other fitting shall always stand in the same convenient position.

Report of the Committee, consisting of Messrs. W. BEDFORD, A. COWAN, Dr. JAMES EDMUNDS, Mr. H. M. HASTINGS, and Mr. A. HADDON (Secretary), *appointed to consider Lens Standards.*

The committee appointed "To consider the adoption of the standard lens fittings recommended by the Photographic Society of Great Britain, or to suggest alterations of that system, and to take or indicate such steps as may be considered necessary for its effective establishment," now submit their report as follows:—

We have carefully, with the aid of the leading opticians, considered the subject remitted to us, and we hope that our recommendations will not only receive the sanction and support of this meeting, but be universally adopted by all who desire the improvement and fuller utilisation of photographic apparatus.

1. We have not seen any reason to depart from the existing "Photographic Society Standards," which, as far as they go, we adopt. The modifications hereinafter suggested are either in the nature of explanation or amplification of those standards.

2. We recommend that the English inch be taken as the standard unit of length with regard to all measurements in connection with lenses, flanges, adapters, and camera screws.

3. That the form of thread for lens-mounts, flanges, adapters, and screws, be that known as the Whitworth angular thread, and in order that there may be no unisunder-

standing with regard to this, we append the specifications, so that any one, wherever situated, can originate this thread-form for himself.

4. That all measurements where screws are concerned be made on the outside of the thread of the male or plug screw when finished.

As to Lens Diaphragms.

We recommend :—

5. That the aperture of the standard unit diaphragm have a diameter equal to one-fourth the equivalent focus of the lens, and be marked "1," the approximate focal length of the lens or combination being engraved on the mount.

6. That diaphragms with smaller openings should have apertures diminishing in area to the extent of one-half the preceding one, so that the second diaphragm should be marked "2," indicating that twice the exposure is required when this stop is used compared with what would have been necessary had diaphragm "1" been used under exactly similar circumstances. The diaphragms should therefore be marked :—

f 4	f 5·6	f 8	f 11·3	f 16	f 22·6	f 32	f 45·2	f 64	&c.
1	2	4	8	16	32	64	128	256	&c.

7. Should a lens not admit of a diaphragm with an aperture as large in diameter as f 4, nor exactly any one of the above-mentioned sizes, we still recommend that the largest diaphragm should be marked with a number in accordance with its area with reference to this unit, and that all diaphragms of smaller area be marked in conformity with the above series.

8. In the case of lenses having working apertures larger in diameter than f 4, the diaphragm with largest aperture should be marked in accordance with its value, and the next ·25 or ·5, if either of these be admissible, and then according to the series given above.

As to Screws for Attaching Lenses to Flanges and Adapters.

9. We recommend the following to be the external diameters of the screwed portions of the lens-mounts for the attachment of the same to the flanges :—

Diameter of Screw in Inches.	No. of Threads per Inch.	Diameter of Screw in Inches.	No. of Threads per Inch.
1	24	*3·5	12
1·25	24	*4	12
*1·5	24	*5	12
1·75	24	And upwards,	
*2	24	advancing by	
*2·5	24	inches.	12
*3	24		

* Screws thus marked are already the established standards of the Photographic Society of Great Britain.

As to Flanges and Adapters.

10. We recommend, in order to provide that all lenses fitting the same flange shall stand with their diaphragm, indices, or other fittings in the same convenient working position, that every ring or muff screw gauge shall bear a zero mark upon its face, and that such part of the lens-mount as is desired uppermost be set to coincide with the zero when the lens is screwed home in the gauge.

11. For convenience and uniformity the zero should be placed where the thread becomes complete, *i.e.*, where the point of a tool cutting such screw-gauge would lie in the plane of the ring face.

12. We recommend that standard adapters to carry any lens in a flange one size larger than its own be numbered as follows :—

Number	1	2	3	4	5	6	7	8	9	10	&c.
Inside Screw ...	1	1.25	1·5	1·75	2	2·5	3	3·5	4	5	&c.
Outside Screw...	1·25	1·5	1·75	2	2·5	3	3·5	4	5	6	&c.

13. The standard adapters to be adjusted in the same manner as the flanges with regard to same convenient working position of diaphragm indices or other fittings of lens mount.

As to Camera Screws.

14. In the case of metal screws used for attachment of camera to tripod, fixing rising front, or any other movable parts of the camera, we recommend that these should be of the form known as the Whitworth angular thread, and of the following diameters and pitch :—

Diameter	$\frac{3}{16}$-inch	$\frac{1}{4}$-inch	$\frac{5}{16}$-inch	$\frac{3}{8}$-inch
No. of threads per inch	24	20	18	16

As to Lens-Hoods.

15. With a view to convenience and to the interchangeability of lens-caps, time-shutters, &c., we recommend that the outside measurements of lens-hoods be finished off to one or other of the sizes given in paragraph 9, and that for each sized camera all the lens-hoods be, as far as practicable, finished off to the same external dimentions.

Appendix.

The Whitworth thread is constructed as follows :—Two parallel lines are drawn, separated by a distance equal to 0·96 of the pitch (distance between two threads) ; these are intersected by two sets of parallel lines inclined to each other at an angle of 55°, and meeting top and bottom, one-sixth of the total depth of the angular thread thus formed being cut off at top and bottom and rounded down.

The altitude of the resulting thread is 0·64 of the pitch.

PHOTOGRAPHIC EXHIBITIONS.

BY GEORGE DAVISON.

IV.—Classification.

In the last article of this series it was argued that competition is incompatible with the best interests of photographic art, and that, instead of awards, a system of rigid rejection of inferior exhibits would not only ensure keen interest in exhibitions, but would also make for the higher credit of photography. It may also be remarked that, with the sweeping away of awards, there go by the board most of the difficulties and evils which follow in the train of the competitive system. Amongst the worst of these are those which are introduced by the practice of classifying photographs which purport to be artistic productions. Even under a prize system the balance of reasonableness is strongly in favour of doing away with classification in the art section of an exhibition. Classification leads inevitably to difficulties, whether with competent or incompetent judges. The absence of classification, if the jury be qualified, can be met with no such objections. The case is somewhat different with scientific exhibits, where the divisions are sharp, and special experts are required.

It is argued that a certain amount of classification is essential to make judging possible or easy, that it encourages the prosecution of special branches of work, and finally, that the very general adoption of classification proves a need in that direction. Only the second of these contentions has any force, and in that experience has taught that classification does not stimulate special applications.

To begin with, how much classification is to be observed? Where shall the line be drawn? If, on the ground of fairness to exhibitors, and to make the work easy for the jury, divisions are commenced, there is no rational limit to the process. The principle being allowed, every one has a right to be classed separately for some difference in his subject or process, and the same argument which is

advanced in favour of separation would require separate judges practised in the respective branches or divisions. This is an absurdity at the outset. If music be taken for analogy, it must be remembered that the abstract beauty of the music is independent of the instrument by which it happens to be produced. There is nothing analogous in saying that it is easier to judge musicians classified into trombonists, pianists, and the like, than if taken together in competition. This idea carried out in photographic competitions would require subdivisions into wet-collodion work, photographs taken with doublets, photographs taken with triplets, hand-camera prints, and so on, distinctions which have nothing to do with the artistic merit of the work. It may possibly stimulate the trade of making bassoons, and the practice of playing that instrument, if it be known that large prizes are specially offered for proficiency in performing thereon, but I am of opinion that such artificial stimulus has generally proved a failure. The rather general adoption of classification in no way proves its advisability, but merely shows that the attention of photographers is too exclusively turned to the mere practical and mechanical means employed, and that those responsible for exhibitions have acquired the idea that manifold subdivisions conduce to attract a large body of exhibitors.

The whole of the arguments that I have objected to are based upon a misapprehension. The question as to whether a certain landscape is better than a certain portrait never arises, nor should it be the function of the judges to arrive at a conclusion which is to be placed first, which second, third, fourth, and so on. No one is qualified to make such distinctions. Each judge would, if working independently, have a different view of the order to be observed. The proper object of the judges is to place the stamp of their approval upon those photographs in which artistic merit is found, and in this a fair general agreement ought not to be a difficulty. There is no limit placed upon the awards. They may be few or many. The awards are equal. One would imagine, from the cry for all this classification for purposes of comparison, that pictures great enough to be worthy of distinction by artists were freely scattered about in photographic exhibitions, whereas the fact stands that in the best of our exhibitions there are never more than six or eight pictures of any completeness. The method of "no classification" works admirably at the Exhibition of the Photographic Society of Great Britain. The difficulty in that, the best of all our exhibitions, is to find eight or ten pictures really worthy as works of art. Generally speaking, only three or four awards seem to be given on these grounds—an equal number, perhaps, being overlooked—whilst the remainder go for some excellence or interest as novelties or eccentricities.

The invariable effect of classification, both with qualified and with incompetent judges, is to multiply prizes. Rigid classification in some degree coerces a judge into yielding here and there in deference to what appears to be the wish of the promoters. A great point is justly made of leaving everything to a good jury, and, in this view, classification is but a farce, and a device for inveigling photographers to send exhibits.

For those who must have classes, there are one or two suggestions worthy of consideration. There should be no divisions according to size; it is a slur upon the judges, and is only part of an ignorant and catch-penny system. There should be no distinction of amateur and professional; it is either a pandering to bad performers, or an excuse for multiplying awards. There should be no hand-camera class or enlargement class in the art section. Instantaneity and amplification find a place in the scientific section, but as pictures, all these should rely simply on their artistic qualities. There are endless anomalies and absurdities introduced by classifications to which it is needless to refer. My experience would lead me to condemn the whole system. If it is best that awards shall be freely bestowed upon every decent workman, those who clamour for classification are right. If it is desired to establish higher claims for photography than are generally admitted, then let the same tests be applied as are brought to bear in painting and in sculpture.

DEPTH OF FOCUS AND DIFFUSION OF FOCUS.*

BY W. K. BURTON.

THE principle from which we may deduce rules that will tell us what diameter of stop to use to get lack of definition proportionate to the focal length of the lens used, is as follows:—

With a comparatively near object focussed for, the disc of confusion, representing a point of a distant object, will be proportionate to the focal lengths of different lenses, when the actual diameter of the stops is the same for all the lenses. In other words, to get a falling off of definition in the distance, proportionate to the focal lengths of the lenses (and therefore approximately proportionate to the size of the picture, if wide-angle lenses be avoided), the stop must be of the same diameter, whatever the focal length of the lens.

From this principle the following simple rules may be deduced:—

If it be wished that "the distance" appear quite sharp when the picture is viewed from a distance equal to the focal length of the lens—that is to say, from the distance, about, that any intelligent person would select for looking at it from—the diameter of the stop must not be larger than $\frac{1}{200}$ of the distance of the object focussed for.

If the stop be as large as $\frac{1}{100}$ the distance of the object photographed for, "the distance" will be perceptibly out of focus.

If the stop be as large as $\frac{1}{50}$ the distance of the object focussed for, "the distance" will be markedly out of focus.

It will be understood that, when "the distance" is mentioned above, what is meant is any object at such a distance that it sends practically parallel rays of light from a point to the whole of the aperture area of the lens. This, for all ordinary photographic lenses, is a few hundred times the focal length of the lens, or anything more.

From the above rules adopted in practice, I have deduced one or two rough approximations as to the maximum diameters of aperture that are admissible in practice. Thus, I find that, no matter how long or how short the focal length of a lens used for landscape work, it is seldom that an aperture of more than about two inches is permissible, on account of the falling off due to lack of depth of focus, whilst in the majority of cases it is not easy to use an aperture of over 1½ inches. Again, in portraiture I find that, whatever the focal length of the lens, or the size of the picture, it is difficult to use an aperture much over 3 inches in diameter, and this on account of the want of depth due to size of aperture only.

* Continued from page 474.

One small point in connection with depth of focus is worth mentioning before I go on to another subject. If we focus for a comparatively near object, and use such a stop as to bring about a certain approach to sharpness in "the distance," we will have the same amount of sharpness (or of want of sharpness) at a distance from the camera of just about one half the distance of the object focussed for. If, for example, we focus for an object at the distance of 200 feet from the camera, whatever stop is used, there will be the same amount of sharpness in "the distance" and in an object at 100 feet from the camera. If, therefore, we wish to divide the focus, or, rather, the lack of focus, equally between the foreground and the distance, we should focus for some point twice as far from the camera as the nearest bit of foreground.

These latter statements hold true only when leaving out of consideration roundness of field and the use of the swing back.

Diffusion of Focus.—This is a subject that has always been of much interest to photographers, but that has had its interest revived lately on account of the views put forward by a set of photographers who call themselves "Naturalists." These photographers—amongst whom are numbered several of those who undoubtedly excel in the production of photographs that are really pictures, and who must, therefore, if possible, be listened to with respect—contend that it is not advisable to have any part of a photograph as sharp as a good photographic lens will make it. It has been contended that the sharpness given by a photographic lens of good quality is greater than ought to be permitted in a photograph, simply considering the matter from an optical point of view. This is a thing that I cannot admit at all, and I think I have satisfactorily proved, in a paper read before the Camera Club, that the contention will not stand the test of a thorough examination. On the other hand, as a mere matter of artistic taste, of "feeling," or of whatever we may be pleased to call it, it has been stated by several of the most artistic workers of the present time in photography that no part of a photograph should be as sharp as it could be made by the use of modern photographic lenses. Coming in this form, the opinion is one that should demand respect, even from those who do not agree with it.

But besides this there is another reason why, in certain cases at least, it seems advisable to sacrifice the keenest definition that it is possible to get. I refer now to those cases in which, on account of the comparatively large apertures that must be used to bring the exposures within reasonable limits, a part of the subject must be markedly out of focus. We have such cases in portraiture, especially in the case of large sizes, and when we have such cases, the fact that one part of the subject is in "wirey" definition, makes the parts that are out of focus only to a moderate extent appear offensively "fuzzy" *by contrast*. To prevent this contrast, the extreme definition is sacrificed by introducing what is generally called a "diffusion of focus" arrangement. Such an arrangement prevents extremely sharp definition, even in the part of the image that is actually focussed for, whilst it does not at all, or does only slightly, increase the lack of definition in other parts of the subject, and, in any case, reduces greatly the *contrast* of parts in the sharpest focus and in less sharp focus.

(To be continued.)

MR. THOMAS BROWN JORDAN, whose death is announced, was the inventor, in 1838, of an instrument for photographically recording the variations of the barometric column.

ANIMAL PHOTOGRAPHY: ITS DIFFICULTIES, USES, AND ABUSES.*

BY GAMBIER BOLTON, F.Z.S.

THE animal and bird studies from life which I shall show you to-night are generally admitted to be the results of one of the first serious attempts yet made to combine, in however small a degree, scientific and artistic qualities in animal photography.

Commencing in 1872 with a three-guinea set from our old friend Fallowfield, of Lambeth, in the days of wet collodion plates and cumbersome apparatus, I have, off and on, both at home and abroad, continued my work amongst birds and animals ever since, labouring under many difficulties of which the portrait, landscape, and hand-camera photographer knows nothing—a puff of wind moving the mane, tail, or feathers: the slight sound causing the twitching of an ear, the quick action of the eye and nostrils, or even the movement necessary in breathing, spoiling hundreds of otherwise perfect plates, many of them only taken after hours, and, in some cases, even days of watching; and, as I shall presently show you, it is quite a common occurrence to use thirty to fifty plates on a single animal or bird, and in some instances nearly one hundred half-plates have been exposed and developed before the one *perfect* negative has been obtained.

From this you will see that a good deal of patience is required—some would call it obstinacy; anyhow, a determination not to be beaten, but to return to the task day after day until the result satisfies you; a natural taste for, and some idea of, zoology, and a certain amount of artistic training is also necessary before the proper positions for the various subjects can be selected—positions that will please and satisfy naturalists, artists, and the general public (three rather hard task-masters); whilst to take up this work with the idea of producing only *the best possible results*, throwing aside all others, must mean such a heavy outlay and expense as to prevent it from ever being made to answer from a financial point of view, at least in our day.

With so many public and private zoological collections around us, there is little or no demand at present for animal photographs, except amongst the learned societies and artists; but we must remember that animals and birds that are useless to man have had their day, have already reached and passed their zenith, and the time is not far distant when photographs of many of these will be sought after, and, like a really good large photograph of the quagga or dodo to-day, would be almost priceless. For following these we have many, such as the bison, aurochs, zebra, giraffe, and hippopotamus fast disappearing before the march of civilisation, and it can only now be a question of a comparatively few years before they, too, become extinct, and we shall be compelled to turn to paintings and, above all, photographs to show our descendants what they were like.

This, then, I consider the first and greatest use of animal photography, and I am glad to say that it is being recognised as such at last; for, as some of you know, the British Museum authorities have lately ordered a set of these studies to be framed and hung in the Geological Section at South Kensington; and if, as I feel sure there are many here who, naturally fond of zoology, have taken up photography as an amusement, I would urge them, especially if they travel, to lose no opportunity of getting good negatives of the more scarce variety of animals and birds, as they will be invaluable for future reference. Do not waste your plates on such childish, easy subjects as swans, deer, cattle, and sheep; our exhibitions have swarmed with them from time immemorial. They have been taken in every conceivable position years ago in the old days of wet collodion and long exposures, when there *was* some difficulty attached to the work. But I urge you to aim somewhat higher. Read up the habits and peculiarities of the animal or bird you propose taking, and endeavour to show them plainly in your finished print, and you will not only be giving yourself real pleasure, but also benefiting the generations to come.

* Read at the Photographic Convention at Chester.

Let me here pause for a moment to answer a question that I am continually being asked, "What is a *perfect* animal photograph?" First and foremost, it should have had sufficient exposure to bring out all possible detail in the hair or feathers and in the shadows, detail being necessary in this branch of photography almost more than in any other. It follows from this that the perfect photograph, though taken in sunlight (which should be avoided if possible), should not be an instantaneous one, but should have had a fair exposure. I know that this means hours of watching and waiting, when a snap-shot might be obtained in a few moments, but the resulting negative is very different; one is of little or no use to anybody, the other may be of use to naturalists and artists for all time. The perfect animal photograph, then, should be free from heavy shadows, full of life, yet unrestrained and natural in position and expression; *all four legs and the tail* should show distinctly, and the mane (if any), nostrils, ears, and eyes, and *hairs round them*, should be microscopically sharp.

I would urge these things particularly upon those who are called upon to judge animal studies, as this is the real test of the perfect one; and may I also add a word of warning? Take care that the photograph was not from a *stuffed* subject, as taxidermy has been brought to such a pitch of perfection (especially abroad) that unless a very careful examination is made, in many cases one may be taken in.

Animal photography is not only useful to the scientist, as I have endeavoured to show, but also to the artist. There are still some, I am sorry to say, who deny that they ever use them, and, as the dealers tell me, slip in and out of their shops looking as though they had committed an unpardonable sin; but, from what I have seen and heard, I am convinced that all use them, and many openly admit their indebtedness to photography, whilst not a few possess cameras of their own, and may be seen using them constantly. It was the need of an artist in the country requiring a special position of a tiger to sketch from that first induced me to publish my series; as going the round of the London dealers, I found that, though one or two had made an attempt to bring out some large-sized photographs of animals, they were taken so small originally as to be woolly and flat, and of no use whatever to the artist; and I was convinced then, as I am now, that no one can hope to succeed in this by occasionally working with a hand-camera, but he must use a large camera, and devote his whole time—in fact, his life—to the work.

I have touched on some of the difficulties and uses of animal photography; let me now speak briefly of its abuses.

I am sorry to say that the professional photographer has a good deal of blame to bear, for he is, I fear, hopeless in this respect. Take a walk round any city and look in at their windows, and you see rows of dogs' *heads*, lacking expression as much as they do bodies, dogs, and cats lying down in sleepy positions, or sitting up looking like wooden dummies, horses and cows with three legs and a smudge representing the tail or ears, all with the scared look that tells of the assistant not far off waving a handerchief or clapping his hands, or taken at such an angle that the heads are large enough for elephants, whilst the bodies fade away into the distance, "fine by degrees, and beautifully less." It is amusing to enter with a dog and say in a quiet way that you wish him taken *standing*, and above all, with his tail *up*. The innumerable excuses that will be invented, the old, old story that heads are so much more fashionable and artistic, that they look so natural when lying down or sitting up, anything but standing, and above all, without that exasperating caudal appendage *raised*.

I have heard photographers lament the waste of time and plates used over a child's portrait, but when they have heard of the hours of watching and hundreds of plates thrown into the waste box before good negatives of the dogs standing and with their tails up can be obtained, they have thanked their stars that *their* lines have fallen in more pleasant places.

Of course there are very rare instances where it is right to take only a head; for instance, when the body is badly shaped, deformed, or injured; but these are very exceptional circumstances, and I would, therefore, urge the professional photographer the wide world over to look to this matter at once, and try to introduce a little more life and expression into his animal photographs, particularly into those of the horse and dog.

But professional photographers are not the only ones to abuse this branch of our art-science. There are amateurs, I regret to say, men high up, in fact, at the very top of the tree, whose pictures (for they are nothing else when the animal portion is left out) have won and are still winning medals at every exhibition, and whose work is pointed out to the rising generation as a model for them to aim up to. They rightly introduce animals into their work, but, using a wide-angle lens, get such hideous distortion as to become perfectly painful to those who have to sit and gaze upon these "nightmares" day after day, as many of us are often compelled to do during a club or "one man" exhibition.

Others, too (and here many of our very oldest workers are the chief offenders), rather than lose some picturesque group, will take a negative with a horse, cow, or donkey's tail or ears blurred from movement, thinking, probably, that the charm and beauty of the whole composition will draw off the attention from such a trivial fault. But surely even our friends the (photographic) naturalists would not strain their theory so far as this, and endeavour to make the blurred ear or tail the starting point for the out-of-focus portion of their picture.

But there are, I regret to say, far worse offenders than either of these. Amongst the changes which I have seen during my photographic life is that of a school of men which has sprung up during the last three or four seasons, calling themselves detective-camera animal photographers. Now there is no harm in using a hand-camera occasionally for animal photography especially if it is made to focus and show exactly what is being taken at the moment of exposure, on the twin-lens principle, for by this means many very valuable negatives can be obtained with a slowed-down shutter, and by working on cloudy days; but the school of which I am now speaking will have none of this. With box cameras and a rough scale for focussing by, they rush about in blazing sunlight taking snap-shots at every conceivable living thing that comes within their reach, and in every possible position; in fact, as we have seen with regret at several exhibitions lately, they simply prostitute this branch of scientific photography by showing us hideous caricatures of some of God's noblest works—animals taken at such an angle as to be all head or hind-quarters, minus one or two legs, an ear, or a tail; lions yawning and scratching themselves, dogs climbing up trees, giraffes all body and no head—things done for the sole purpose, as they often admit, of raising a laugh at the unhappy animal's expense. How, I venture to ask, would one of these so-called artists of the funny school like to see themselves, on show in a shop window, taken when suffering from influenza, a bad toothache, or when they have just trod or sat down upon the business end of a tin tack? Surely our aim should be a higher one than this, and if we are going to devote our time to zoological photography, let us at least try to show our subjects in the most artistic and natural positions.

Forgive me if I have spoken too strongly on this subject, but when we see signs all around us of animals fast dying out, and being rapidly exterminated as civilisation advances, it is surely time for someone to make a stand, and, in endeavouring to point out the uses of animal photography, not to pass by in silence its glaring and manifold abuses, which not only scientists and artists have condemned, but which the good taste and better education of the rising generation has taught them *are* abuses; and I trust sincerely that those who have perpetrated them will leave this branch of photography alone for the future, and turn their attention and *talents* to something a little less ambitious than the endeavour to win for themselves the proud title of *the Landseers of photography*; for this cannot be laid claim to by any precocious aspirant after a few months of practice at animal photography, but can only be hoped for after years of hard work of head and hand; and besides such a title as this, all those vapoury names of kings and princes of hand-camera work which they

have arrogated to themselves must fade into insignificance, for there may be many kings and princes, but we have at present no Landseer.

I propose showing you, first, two slides as an instance of *how not to do it*. The first is that of a lion (?) standing behind the bars of his cage. This slide, I am told by the maker, has been sold by thousands, and is used all over the civilised world with lectures as an example of what the king of beasts looks like. Beyond a nose and a few hairs there is absolutely nothing but a very fine study of iron bars. The hand-camera school are particularly fond of these negatives, one of them observing last year that he thought the bars gave a greater idea of the animal's ferocity and strength ; he forgot to add that he could not possibly photograph them *without* the bars, as he was not permitted to get inside the outer enclosures at the Zoological Gardens.

The second slide that I propose showing you is that of a bull-dog, bought from a shop window in London last week. This is rather a good specimen of its kind, but he is strapped down in the long grass apparently to a rock, and, as a study of a collar, strap, grass, and stone, is good, but there is very little bull-dog ; and how anyone could ever be tempted to waste a plate on such a really good subject in such a hideous position as this is one of those things that will probably never be revealed till later on.

I shall next try to show you what I hope you will agree in saying is *the way to do it*. Commencing with the *Carnivora* (taken standing, in dull light, and without the bars), we will pass on through the *Ungulata*, leaving the birds and dogs till the end.

I would mention that all these studies were taken with an ordinary whole-plate camera and Ross lens, rarely instantaneous, but most on dull days, the majority having had exposures of from one to two seconds.

Mr. Gambier Bolton then exhibited about fifty slides, which, he mentioned, had this season been exhibited at the Royal Society, Burlington House; Royal Institution (twice), and before the Zoological Society, London; and had been awarded medals at the Crystal Palace two consecutive years.

Proceedings of Societies.

Photographic Society of Great Britain.

The technical meeting of this Society was held on the 24th inst., Mr. Leon Warnerke in the chair.

Mr. H. Chapman Jones brought forward a double dark slide that he had produced at the meeting held in January last. He had then also exhibited two plates that had been kept in this slide, and that showed with under-exposure patches of increased development opposite to where the hinges had been. These hinges had originally been of leather, but this material had been removed, as it had been found to cause fogging at the part of the plate opposite to it, and a woven material had been substituted for the leather. On the plates shown in January, which had been placed in the slide immediately after the new material had replaced the leather, he had attributed the markings to increase of sensitiveness, which, he thought, was caused by the same substance in the leather which had at first caused fogging, having penetrated the woodwork and being given off afterwards in such small quantity as to be insufficient to fog, but enough to exalt the sensitiveness. Some members had then suggested that there was not an increase of sensitiveness in that part of the plate opposite to the hinges, but a decrease in the rest of the plate, due to the wood or varnish used. He thought that he could now show that this theory was not the correct one, as he had since kept plates in the slide for some months, plates cut out of larger ones of which he had kept the remaining pieces, and on developing he could not find the slightest difference in sensitiveness, or any mark opposite the hinge. The absence of the marking now he considered to be due to the emanation originally belonging to the leather and left in the wood having exhausted itself in the first week or two.

The Chairman mentioned that he had had a slide which caused fogging, not due to leather, for there was no hinge to it, as it was one of those where the shutter was made to draw out entirely. The inside of this shutter was varnished, and there was a projection in the cut-off which scraped away the varnish in two lines. Plates placed in this slide showed clear spaces opposite to these lines, whilst the rest was fogged. Further to test it, he had scraped an image on the shutter, and found that a plate, after keeping in the slide for some time, reproduced the image in the same way that the lines had been reproduced. He could not say what was the composition of the varnish that gave off such a deleterious action.

Mr. Atkinson remarked that he had found great difficulty in keeping flexible celluloid films flat in the press whilst printing. He also noticed that they were not flat in the camera when there was any tension on the rollers of the dark slide.

The Chairman said that to get the celluloid to lie flat whilst printing, a press must be used with many screws at the back. He had one of twelve by ten size, the back of which had been sawn nearly through in lines making twelve squares, on each of which a screw was brought down. He thus secured good contact.

Mr. Atkinson remarked that it was a complaint that there was no good way of varnishing celluloid. He had found Mawson's varnish, supplied expressly for celluloid, to answer exceedingly well.

A Member referred to the use of gold size thinned with benzole or turpentine ; but

The Chairman stated that gold size darkened so much in time that its use was a serious disadvantage. A solution of amber in chloroform made a varnish that answered very well. Some linseed oil darkened very much, whilst other samples did not do so. Linseed oil was boiled sometimes with lead, and sometimes with manganese. In the former case darkening must be expected. There was a work of Spon's giving several details on the subject.

Mr. Scamell said that there was also one of Weale's series, by Field, in which various formulæ would be found relating to varnishes and drying oils.

Mr. Atkinson asked whether celluloid films were liable to decay.

The Chairman had some now that he had had for fifteen years, and could find no change in them.

Mr. W. England considered that they were as durable as glass.

The Liverpool Amateur Photographic Association.

At the meeting in the Club Rooms, 3, Lord Street, on June 19th, Mr. Paul Lange presided, and the following were elected members of the Association : Messrs. Albert Proctor, Alexander Cannon, Wm. T. Philip, J. N. Stolterfoht, and James D. Paterson.

The President reported on the excursion to Rossett and Gresford on the 7th inst., when about thirty members and six ladies were present, and 200 pictures were secured. He mentioned that the next excursion would take place on July 19th (whole day), to Bolton Abbey. He also entered into a detailed explanation of the Chester Convention, and recommended the use of Mawson's backed plates for taking the interior of Eaton Hall.

On the 31st July Mr. J. W. Wade, vice-president of the Manchester Amateur Photographic Society, will give a paper on "Landscape Photography," with illustrations in charcoal, and he will also introduce a chapter on architectural photography. Later on, in August or September, the Britannia Company is to give a demonstration with their alpha paper.

A fine mounted print was presented to the Society by Mr. Friese Greene of the Convention members group of 1889, taken on 24 by 20 glass plate slightly cut down.

The late Mr. J. W. Robinson, junr., a young member of the Society who died last month, has bequeathed his camera and outfit to the Association for the use of the members of the Society.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 19th inst. Mr. J. J. BRIGINSHAW occupied the chair.

The next meeting being the annual meeting, officers for the ensuing year were nominated in accordance with the rules.

Mr. J. P. EVERITT showed prints in platinotype of negatives taken at the outing at Hale End the previous Saturday. He also passed round silver prints from the same negatives for comparison, arising out of the discussion of the previous week.

Mr. W. E. DEBENHAM was in favour of the albumenised prints as showing more ærial perspective and gradation, an opinion that was shared by many other members present.

Mr. T. E. FRESHWATER also showed some prints taken at the same outing; these were on Pizzighelli paper. Replying to a question, Mr. Freshwater said these had taken two and a half hours to print.

A question from the box was read: "Is there any advantage in printing through green glass on to silver paper?"

Mr. PASK said at the Photographic Exhibition recently held in the City, some silver prints were exhibited which were stated to have been printed under green glass.

The HON. SEC. said that he had used with advantage a sheet of green gelatine in printing from collodion negatives when they were of a slatey tint.

Mr. T. E. FRESHWATER exhibited some prints from negatives taken during his holidays last summer; these, in several cases, showed a dark broad band down the centre, which he attributed to unequal coating of the plates.

Mr. W. E. DEBENHAM said a piece of loose string hanging down behind the lens would produce a similar effect. Various theories were put forward to account for the markings; it was, however, generally agreed that they were caused by some defect of the camera.

Mr. FRESHWATER said he would bring his camera down to the next meeting; he believed it to be quite perfect.

A question from the box was read: "Can anyone tell what is 'bone dryness?'"

Mr. W. E. DEBENHAM said he should consider an article to be in this condition when no moisture was perceptible to the senses.

PHOTOGRAPHIC CLUB.—The subject for discussion on July 2nd will be the "Report of the Convention Delegates"; July 9th, "Photographing Theatrical Scenery."

RECEIVED.—From Messrs. Piper and Carter, "A Casket of Photographic Gems": A Collection of 500 Dodges, Receipts, Entertaining Experiments, &c., in connection with the Art of Photography and its Branches, collected, classified, and arranged for ready reference, by Ingles Rogers." The compiler explains that the favourable reception of the pamphlet entitled "One Hundred Photographic Dodges" induced him to produce a work of a similar nature on a larger scale, culled from the photographic literature of the past half-dozen years. Like the former work, the present one is intended "as a ready reference book for the 'old hand,' as well as a means of instruction for the beginner, and to form a handy pocket companion for both." The book consists of 142 pages, and contains as frontispiece a specimen of Messrs. Waterlow and Son's collotype work, representing Cookham Lock, with a party of pleasure seekers returning from Henley Regatta.——The same publishers submit a copy of the "Evolution of Photography," by John Werge. It comprises a chronological record of discoveries and inventions, contributions to photographic literature, and personal reminiscences extending over forty years, and is illustrated by plates giving portraits of those whose names are identified as leaders in the advancement of the photographic art. We will say no more of this book at present than that it is divided into four periods: the first deals with such facts as bear on the discoveries, early researches, and ultimate success of the pioneers of photography; the second embraces a fuller description of their successes and results; the third is devoted to a consideration of patents and impediments; and the fourth to the rise and development of photographic literature and art.

Answers to Correspondents.

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

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

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

TEIGNBRIDGE.—Our Holmescope came from Messrs. H. T. Anthony and Co., of New York, but we believe they are procurable from the Eastman Photographic Company, 115, Oxford Street, W.

L. E. M.—*Printing Hard Negatives.* Improved results can sometimes be obtained by sunning the paper prints from the back. Another method is to screen off the under-exposed masses of shadow by one or two folds of tissue paper, or use a thin transparency as a mask to be superposed whilst printing. Perhaps the best method is to coat the finished hard negative with collodion emulsion, give a brief exposure to light through the back, develop, and work with this compound negative. Or, lastly, reproduce the negative with full exposures at both stages of this operation.

F. M. S.—*The Solar Eclipse.* You seem to have been more fortunate than observers in London or the metropolitan district, where, owing to the clouds and rain, the eclipse was scarcely visible.

J. S. R. (Brighton).—*Yellow Stains on Albumenised Prints.* Failing to discover the cause of the yellowish colouration, unless it be hypo, it is at least satisfactory to find that the prints may be so easily cleared by immersion in dilute hydrochloric acid; but you must remember that if working with rose-tinted paper the acid will dissolve out the whole of the rosaniline, and necessarily alter the tone of the print.

VIATOR.—*Smokeless Powder.* We have seen the photographs to which you refer, but the military considerations involved scarcely come within the province of discussion in these columns.

A. W.—*Maignen's Softening Process.* Further enquiry has elicited the fact that the inventor proposes to boil powdered charcoal with lime water, and then use this preparation for softening water by stirring in a small quantity, and afterwards filtering through his asbestos cloth.

L. P. (Norwich).—*Aluminium Lens Mountings.* Not an alloy of aluminium, but the pure metal itself is now employed by several leading opticians in the mounting of their lenses, for the sake of diminishing their weight. With care they ought to prove incorrodible, but we cannot answer for sea-spray not affecting the metal.

M. T.—*Hypo Eliminator.* Hydrogen peroxide has already been proposed, but is not easy to procure, and it may possibly act upon the albumen coating, if not upon the finely reduced metal constituting the image. It is far preferable to depend upon a thorough washing, or even upon treatment with a weak acid, to destroy any remaining trace of hypo.

J. G. M. (Scarboro')—*Printing out Emulsion.* This may be the ordinary collodio-chloride, such as described at page 203 of the YEAR-BOOK, or Captain Abney's gelatino-citro-chloride; see his "Instructions in Photography," pages 288 and 289. If neither of these will answer your purpose, apply to Mr. Friese Greene for a suitable preparation, or to Messrs. George Houghton and Sons, High Holborn, W.C.

INTAGLIO.—*Electro Carbon Reliefs.* These were executed as far back as 1860 by Mr. J. W. Swan, specimens being shown in the historical collection at the International Inventions Exhibition. Seven years later, Mr. Woodbury produced some plaster casts from his gelatine reliefs, and showed them at the Dundee meeting of the British Association, stating that these could be copied by the electrotype process if desired. Many later experimentalists have worked at the same subject, some of them taking casts in Spence's metal.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1661.—*July* 4, 1890.

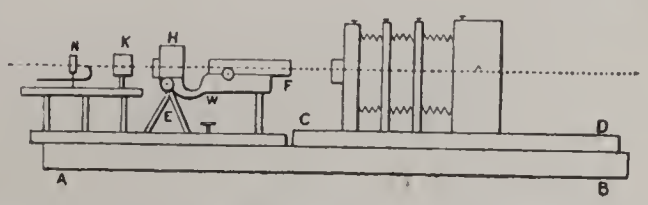
CONTENTS.

NOVELTIES AT THE PHOTOGRAPHIC CONVENTION.

THREE instruments of special novelty were exhibited at the Photographic Convention at Chester; one of them was a new photometer, another a photo-micrographic camera of new design, and the third a new magazine camera.

The photometer was the invention of Mr. Frederick H. Varley, and his article describing it will be found in another column. Mr. Friese Greene exhibited the instrument to the Convention. It consists of a rotating disc with two variable apertures, which can be opened or closed during rotation by the ingenious mechanical contrivance known as the Furgusson paradox. The light from the one source passses through one of the apertures, and the light from the other source through the second aperture. A comparison is made by means of two shadows, the relative depth of which is regulated by the size of the apertures. When the shadows are balanced, the angular aperture of the two orifices is read off. The advantage of this instrument is, that both the electric light and the standard flame are measured when they are at the same distance from the screen; consequently the two shadows are of equal size, so the density of the shadows for equal areas is the same when balanced. This feat, we believe, has not previously been achieved in photometry, except in the wedge photometer of Dr. Wollaston, which, however, is of too limited a range to be suitable for most practical purposes. Mr. Varley and Mr. Friese Greene are arranging some experiments for determining by means of this photometer the value of direct sunlight in candle power; also the value of reflected light from the clouds, blue sky, foliage, and other objects. Scientific data of this kind will be of interest to photographers.

Another remarkable piece of apparatus exhibited at the Convention was a photo-micrographic instrument designed by Mr. Andrew Pringle, and constructed by order of the Privy Council by Messrs. James Swift and Son. In high photo-micrography absolute steadiness of the apparatus is as necessary as it is in large astronomical telescopes, or in the galvanometers used in working the Atlantic cables; therefore the chief feature of Mr. Pringle's instrument is its great steadiness and solidity. Its principle may be explained by the aid of the accompanying diagram, in which A B is the base-



board of mahogany, measuring 6 feet 8 inches by 20 inches, and C D is one of two pieces of heavy solid mahogany forming a tramway on which the camera slides in brass guides, and to which it can be firmly clamped by screws. The camera takes half-plates, and has an extension of from eleven inches to four and a-half feet. A special feature of this invention is the brass cradle, W F, which is so formed as to hold both ends of the microscope tube when high powers are used; thus all vibration of the tube at the eye-piece end is prevented. H is an adjustable stage, with a sub-stage condenser; K is an achromatic condensing lens, and N the lime cylinder for the oxyhydrogen light. The cradle is steadily mounted at one end upon a brass trestle, two legs of which are shown at E; at the other end it is supported below F. The lime light part of the apparatus is mounted upon a platform, so that it can be made to approach to or recede from the microscope, and to give a divergent or parallel beam of light at the will of the operator. The whole of this end of the instrument turns round upon a base-board to permit the adjustment of the object. The ultimate destination of this apparatus is the Royal Veterinary College, Camden Town, London, where a room in the basement has been specially arranged for its reception, and where it will be fixed on a support of heavy masonry, resting upon a foundation of solid concrete.

The third novelty of mark exhibited at the Conven-

tion was a new camera, a great improvement upon the one described a few months ago in these pages, for taking negatives upon an endless film at the rate of from five to ten or more per second. The original camera, invented by Mr. Friese Greene and Mr. Mortimer Evans, paid out a certain length of film for each picture, and this slack length was suddenly drawn into position for the exposure. The later camera, first publicly exhibited at the Chester Convention by Mr. Friese Greene, was the invention of Mr. Frederick Varley, and in it the film is never allowed to slacken, but is kept taut by means of springs acting differentially inside the paying-out roller and the receiving-roller, so that the two rollers have always a balanced spring-pull in opposite directions. When a length of film is required for exposure a disturbing element comes into play in the shape of a horizontal roller, which rises and draws off exactly the length of film required for the next picture. By this instrument the film is paid out with great steadiness and regularity, and none of the film is wasted, for each negative is separated by but a narrow line from its successor. Application has been made for a patent for this camera, which is likely to be useful for military and other purposes, in addition to those purposes which Mr. Friese Greene had in view when he started the idea of cameras of this class. With the optical means at present in use in such of these cameras as have been constructed, he says that he finds exposures at the rate of about five per second to be the best speed for obtaining good negatives sufficiently near each other in time to convey the idea of life and motion when successive positives from them are projected at the same speed upon a screen by means of a suitable lantern.

As to this matter of speed, Mr. Greene said to the Convention: "The familiar experiment of the complete ring of light seen upon whirling a burning stick in a dark room, shows that the sensation of sight lasts for a short period after the mechanical action which produced it has ceased. This period is probably different for different eyes, and for different amounts of excitation even in the same eyes; I hope to prove, at some future date, by the pictures taken with the machine camera, that some people see them perfectly on the screen when they are produced at the rate of three a second, that others see them perfectly at four, five, and six a second. Of course, the size of the picture upon the screen, and the amount of light which the lantern can give, have something to do with it too. If the light be very intense the effects last much longer, so that you can run them through slowly. For the present purpose it may be assumed that a speed of from three to seven per second will be enough to show life-like effects to any audience, or to represent nature in motion as we see it. The duration of visionary impression varies with the powers or structure of the eye in different individuals, just as the time necessary for the recovery of the tone of the retina varies in passing from brightness to darkness."

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

LAST week we published particulars about the Photographic Convention at Chester, until the time of going to press, when the members of the Convention were leaving Conway. The Castle Hotel, at Conway, where lunch was taken by the excursionists, and at which Mr. Bothamley, the President of the Convention, is well-known, is a centre for artists, and much visited by Americans in the summer months when *en route* from Holyhead to London, because Miss Dutton, its proprietor, has a large collection of works of art of various kinds.

Here we found original works by Cipriani (the founder, with Sir Joshua Reynolds, of our Royal Academy), Romney, Sir Thomas Lawrence, David Cox, Frederick Tayler (the late President of the Royal Water Colour Society), J. W. Whittaker and J. D. Watson, both distinguished members of the same Society, Joseph Knight, who is one of our best English etchers, Dawson Watson, Buckley Ousey, Edwin Ellis, R. Somerset, Dan. Fisher, R. Gallon (the President of the Crichton Art Club), Peter Ghent, W. L. Banks, W. B. Turner, J. C. Salomon, Charles Potter, and others. There is also a handsome specimen of the Old English Water Colour School of the middle of last century, by Smith of Chichester. Its purity of colour is in marked contrast with the water colours of modern days, in which body colour is so freely used. There is a half-length life-sized original portrait of Dame Penderil, of Boscobel, notorious for her loyalty and fidelity to the gay and popular though ungrateful monarch, Charles II.

The Conway and Bettws-y-Coed parties returned by various trains to Chester in the evening. The majority returned by the earliest train to be present at the reading of papers, and in this train was Mr. Ephraim Wood, the chief superintendent of the Chester and Holyhead line, who was fully alive to the business advantages of a number of professional and other photographers being at work in his district, and afterwards scattering pictures thereof broadcast all over the country. He personally superintended the excursion arrangements.

On Thursday evening, Mr. Andrew Pringle read a paper entitled "The Record of Photo-Micrography," and the report of the committee on "Weights and Measures" was read. Mr. Friese Greene also read a paper, entitled "Suggestions," from which we give to-day a quotation in our leading article, and more extended descriptions of the instruments he described than he had time to put before the meeting.

On Friday last views were taken by the excursionists at Hawarden Castle, and in the evening there was a dinner of the Convention at the Grosvenor Hotel, Chester, which great hotel is under the genial management of the experienced Mr. Foster. Mr. Bothamley presided, various after-dinner speeches were made, and a number of recitations and songs contributed by the members. The hard-working honorary secretary, Mr. Briginshaw, was "toasted," and was styled "The Father of the Convention."

On Saturday morning last there was a meeting of the General Committee, at which Mr. William Bedford was appointed President of the Convention for the Bath meeting next year. In the middle of the day most of the members left Chester.

PHOTOGRAPHING FLOWERS.

It is a remarkable circumstance in these days of universal photography, and when some kind of photographic apparatus can be found in more than one house in every street, that flowers, the most beautiful gifts of inanimate nature, should be almost entirely neglected by the camera bearer. They are within the reach of nearly all, for although some of us are destined to spend the best part of our lives amid bricks and mortar, and in houses whose back gardens take the form of "leads," still we have friends who, better off than ourselves, are provided with greenhouses; or, by the expenditure of a very modest sum at the nearest florist's, we can provide ourselves with a bouquet of beauty. Artists who devote their first attempts to still life eagerly take up flower and fruit painting, attracted, of course, by the wonderful and unending contrasts of form and colour which these models afford. Perhaps it is mainly because photographers are excluded from the chromatic world that they have not paid more attention to this branch of work. Whatever be the reason, flowers are neglected by photographers. In our photographic exhibitions we seldom see pictures of flowers, and, as far as we can remember, only one worker, whose beautiful orchids won prizes at all the exhibitions half-a-dozen years back, has seriously devoted his energies to portraying Flora.

There are certainly difficulties to be met with in photographing flowers which do not often assail those who are engaged in the more ordinary paths of work. One of the chief of these is the necessary nearness of the objects to the camera—a difficulty which will be at once appreciated by anyone who endeavours to focus upon his ground-glass screen the image of a flower-spangled hedgerow. It is at once seen that, owing to the various planes of the different petals, only a few can be brought to a sharp focus at one time. It is of course the same if we attempt to photograph a single flower or a mass of flowers in a greenhouse, but here we are relieved of one great difficulty in having a perfectly still atmosphere to work in. But, whereas in the open air it is next to impossible to reduce the growth to one plane, unless, indeed, we clip away half its beauty with a pair of shears, in the greenhouse we are able to mitigate the evils to a very great extent by adopting certain precautions. The flowers, being in pots, can be moved about and grouped as we may think best, and any petal bearing stems which are obtrusively prominent—and therefore out of focus—can be held back by the temporary expedient of attaching to them grey lines of the thinnest binding wire. We have tried this plan many times with great success, but care must be taken in adopting this method of pulling the stems out of their natural position that they are not so awkwardly placed that the dodge is likely to be detected. Care must also be taken that the wires used are properly concealed.

In photographing flowers in a greenhouse it will generally be necessary to provide some kind of background. The entire beauty of the picture will be sacrificed if the straight lines of the beading between the glass panes come into view, and more especially if the bright sky is seen through them. A square yard of some good tinted material—such as is used for ordinary studio backgrounds—will answer the purpose better than anything else, but it should, if possible, be stretched on a frame, so as to present one even, unwrinkled surface. In the absence of a greenhouse, and when we wish to photograph flowers in the form of a bouquet, we shall do well to conduct operations in the studio or in an ordinary room. In the first case no difficulty should present itself with regard to lighting, for curtains, screens, and blinds are under ready control, but in an ordinary room, as in the case of portraiture, special arrangements have to be made.

The flowers must first of all be grouped as artistically as possible, and may by preference be held in some kind of ornamental vase. This should be of glass or of some light coloured material—such as alabaster—in order that there may be contrast between it and the flowers which it holds. This vase should be placed near a window where there is a good diffused light—not actual sunlight—with a looking glass or white screen at the other side, so as to reflect light on its shady parts. The background should not be too dark, nor should it be of a pronounced pattern of any kind. All must be as light and airy in design as possible. The flowers themselves must not be matted together, and it will be found that a few—say some choice roses or lilies relieved by sprigs of maidenhair or feathery grasses—will be far more effective than a great number.

We have occasionally seen flower photographs—generally roughly coloured—exposed for sale in some of the shops, and they are useful as a guide to show what to avoid. These flowers appear to have been grouped and supported on a sheet of white cardboard, with the result that a heavy black shadow—a kind of mourning band—borders them on all sides, for the light in which they have been photographed appears to have come from the front, that is, behind the camera. Strong contrasts are most easy to obtain in photographing flowers, and they should be carefully avoided, firstly, by suitably lighting the object and providing a proper background, and secondly, by giving a prolonged exposure with a small stop, so that development may proceed without the least forcing and blocking up of the high lights.

The lens which is kept to use for flower work is one of the rectilinear type. Almost any lens except a portrait lens will do for photographing flowers, provided it can be well stopped down. To get the best results it is as well to use isochromatic plates, and many published pictures have shown us all what good service such colour sensitive plates will do in this particular field of work. But ordinary plates, if used with a yellow screen behind the lens, and with the protracted exposure which that course entails, will give results which are difficult if not impossible to distinguish from those obtained by the use of isochromatic plates.

A short time ago we selected a number of yellow, red, and blue flowers, and photographed them with ordinary plates under the conditions just described, and also with colour sensitive plates, and we could hardly distinguish any differences between the two sets of negatives when afterwards compared.

Now that spring has "unlocked the flowers to paint the laughing soil," photographers have an opportunity of taking their portraits, which should not be missed. If the pictures appear to have no particular value, the operation of taking them will at least bring a return to the worker to showing him the effects of various colours on the sensitive surface of his plates, and teaching him how those effects can be modified by means at his disposal.

A NEW PHOTOMETER.

BY F. H. VARLEY, M.I.E.E., F.R.A.S.

IN writing upon photometry, it is as well to pass in review the various appliances that have been devised for obtaining a measurement of the comparative intensities of different sources of light. This at once brings us to an adopted standard of light, unfortunately as purely arbitrary as the foot rule is for a standard of length. This standard is termed the candle power, and is the amount of light produced from a sperm candle burning 132 grains (or 8·553 grammes) of spermaceti per hour, the pressure of the barometer being 760 millimetres, and this standard is the adopted one employed by all the gas companies for measuring the c.p. (candle power) of their gas.

The celebrated Dr. Wollaston, the discoverer of palladium and inventor of the goniometer, employed for his researches a wedge-shaped trough, with glass sides, filled with an inky fluid. Both the standard light and the one to be compared had to pass through this intercepting medium; thus, the gas-flame passed through the thicker end of the wedge, and the standard through the thinner, and the lights were moved nearer or farther apart until the shadows cast by both were equal; the intensity of the light being determined by the mean section of each portion of the wedge through which the respective lights passed. In his astronomical researches he used wedges made of neutral tint glasses, and with these he determined the value of light coming to us from the stars. The value of Sirius he gives as being that of $\frac{1}{20000}$ millionth part of that produced from the sun; the sun, according to the same authority, being equal to the light produced by 5,563 wax candles burning at one foot distance from the screen.

Professor Wheatstone employed a vibrating bead of silvered glass, and the two lights to be compared appear, by reflection, as two parallel luminous lines. By employing the law that "the intensity of the illumination of any body in the presence of a source of light will depend upon its distance from that source;" and secondly, that light decreases as the square of the distance of the luminous body; a distance is found when the luminous parallel lines are equally bright—that is to say, that by altering the relative distances of the two lights until the luminous lines appear to be of equal intensity, and squaring these distances from the vibrating bead, the different illuminating power of the two sources of light is readily measured.

In place of the vibrating bead of Wheatstone's, the Bunsen screen is generally adopted, a long scale having at one end a standard candle, and the light to be measured at the other, is provided with a tram line, upon which runs a carriage carrying the Bunsen screen. By moving this screen between the two lights until a position is found where both surfaces are equally illuminated, and measuring its relative distance from the two lights, and squaring their distances as before mentioned, their measurement is obtained. These photometers are fitted up in a room painted a dead black in every part, so that no false light by reflection shall interfere with the correctness of the readings. With such an apparatus a light up to 400 candle power can be measured; but when an electric arc light has to be determined, the photometer room would have to be from 50 feet to 100 feet in length to obtain the balanced illumination of the Bunsen screen. If we are measuring a 10,000 candle-power arc light, the distance would be as follows:—Standard candle from screen one foot, electric light from screen 100 feet, that taken as the value of the square of the distance—namely, 100 by 100 = 10,000 candle power at one foot.

Professors Ayrton and Perry have devised a photometer by which the distance of the electric light from the screen may be very considerably reduced. The light falls upon a given area—say a circular inch—and passes through a concave lens which diffuses the light, and causes it to spread out, the area of the diffused circle depending upon the distance of the screen from the concave lens. Assuming that it be made to cover a plane exactly ten inches in diameter, the decrease of illumination will be proportional to the square of the diameter, or a one-hundredth part as bright. By this device the distance of the electric light from the concave lens can be reduced to ten feet, when it would balance the standard light at one foot from the screen, or, in other words, $10^2 \times 10^2 = 10{,}000$, the amount of light produced from the electric arc.

Captain W. de W. Abney has obtained the reduction of the brighter light by employing rotating sectors which allow only a given quantity of light to pass, which he can vary at will by opening and closing the sectors whilst they are being rotated, and he determines the value of the light by calculating the areas of the wedge-shape openings. Figs. 1, 2, and 3 illustrate this.

Fig. 1. *Fig.* 2. *Fig.* 3.

Fig. 1 shows the sectors open to full extent, viz., 90°, when 50 per cent. of the light will be intercepted, and 50 per cent. pass through.

Fig. 2 shows the sectors open 45°, when 75 per cent. of the light is stopped, and 25 per cent. passes through.

Fig. 3 shows the sectors open 18°, when 90 per cent. of the light is stopped, and 10 per cent. only passes.

The photometer I am now about to describe differs from all these in being a direct reading instrument, in which the standard and the light required to be determined are both placed at the same distance from the screen shown by fig. 8.

Two discs, perforated by semi-ring-shaped openings, the breadth of which are equal, as shown in fig. 5, are

mounted on an axis with their openings reversed, so that when the outer half-ring is fully open (extending to 180°) the inner ring is entirely closed; or if the outer half-ring is open to 90°, then the inner ring will be opened to

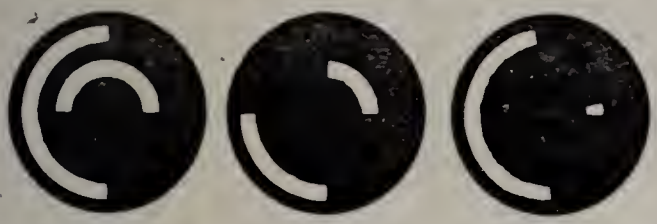


Fig. 5. *Fig. 6.* *Fig. 7.*

the same extent, as shown in fig. 6. In that case, when the discs are rotated, two complete circles are formed, through which an equal amount of light will pass. Again, as in fig. 7, the outer ring is nearly open, and the inner

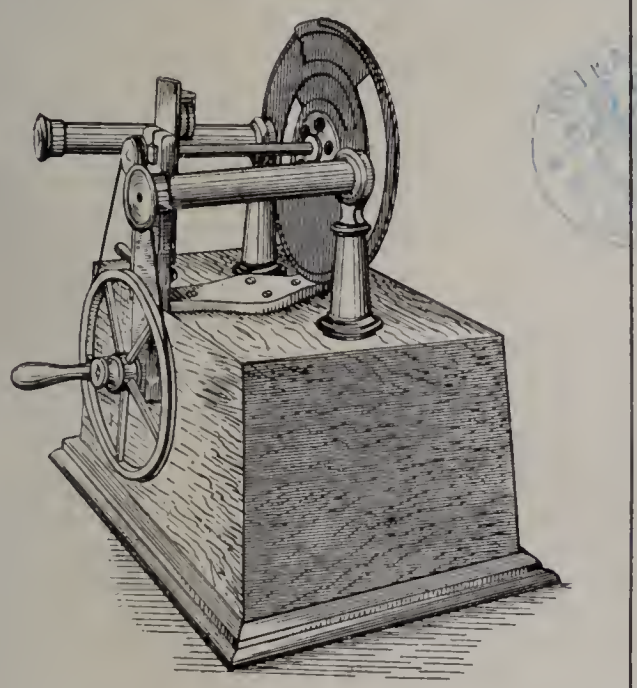


Fig. 4.

one only partially so. As before, two rings are formed upon rotation, but the amount of light which passes through will be unequal, being, in fact, directly proportionate as the extent of the degrees of arc of the openings are to one another. If, say, the outer ring is opened 160°, and the inner 20°, in order that the more intense light passing through the inner circle shall balance the standard light passing through the outer, all that has to be done is to read off the respective degrees and write them down in the form of fractions—that is, $\frac{20}{160} = \frac{1}{8}$; from this we ascertain that the light is eight times more intense than the standard. Instead of the conventional division of the circle, we divide the half-circle into 2,000 parts, for the purpose of obtaining a finer or more extended range of reading up to 1,999 times.; these divisions, by means of a vernier, can be further subdivided ten times, and read up to 20,000 candles in round numbers.

The breadth of the semi-ring-shaped windows in this instrument is one inch, and in front of the discs are two equal collimators, one of which projects a disc with a black centre, and the other a corresponding luminous spot. They are regulated so that when the light falling upon the screen from both sources is equal, a uniform disc is obtained; but if one or the other preponderates, a disc with a grey spot, or a grey marginal ring with a bright spot, indicates which of the two sources of light reaching the screen predominates.

In order to regulate this, it is necessary to open one of the windows and close the other until a balance is obtained. This is effected by bringing into play a modification of the well-known Furgusson paradox: the rear disc is carried by the central axis, and the front disc by a long sleeve fitting over it; both the central axis and the sleeve are provided with tooth wheels. Above these is an axis which carries two wheels, one with a hundred teeth, and the other with ninety-nine teeth, which are readily placed in or out of gear by a jointed lever; when in gear they cause the two discs to shift or turn upon each other, and so open or close the windows. It is convenient in some cases to dispense with the collimators, and determine the values of the light by comparison shadows, in which case a T-shaped screen is employed pierced with

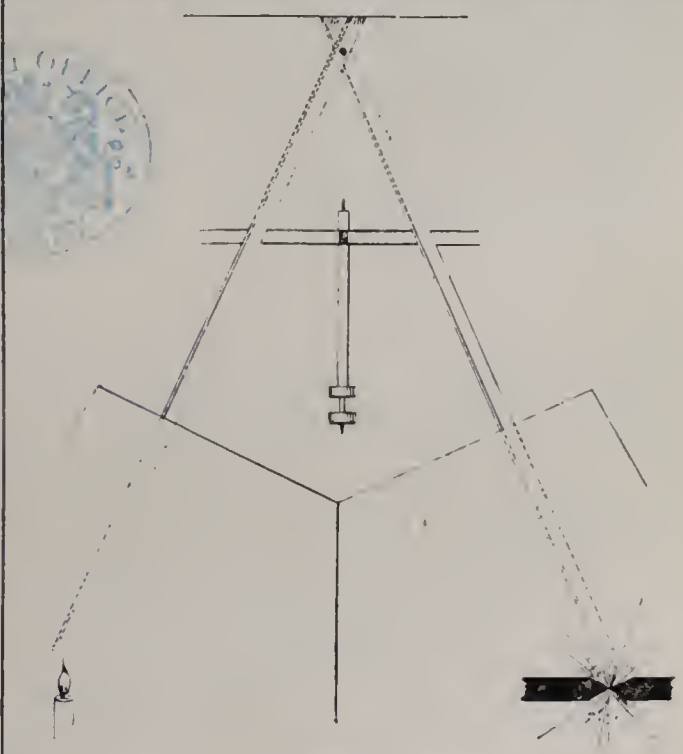


Fig. 8.

two holes each a circular inch in diameter, the centres of which are of a distance apart which corresponds with the mean diameter of the circular windows through which the light passes on to the screen. The middle partition forming the T prevents one light from interfering with the other. The apparatus is set in rotation by turning a band wheel, and the windows adjusted until the two shadows balance. The values are read off from the divided scale of 2,000 parts, which is numbered from left to right, and right to left, giving at once the fraction values of the ratios of one aperture to the other.

Photographic Society of Upsala. — Mr. N. C. Duner writes that the number of the members of this society now reaches fifty, and that it has been resolved to hold an exhibition of members' work in the autumn.

Photo-Micrographs of Diatoms.—MM. A. Traun and Witt, in their work on the fossil diatoms of Hayti, describe their peculiar method of photographing these objects. They first photograph the diatoms with a magnification of not more than 100 diameters, and afterwards enlarge the negatives, so as to obtain a photograph magnified 500 diameters, proper for photo-printing. Fine details are said to be brought out, which are invisible to the naked eye in the smaller photograph.—*The Microscope.*

DEPTH OF FOCUS AND DIFFUSION OF FOCUS.*

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

THE introduction of "diffusion of focus" was first suggested by Mr. J. Traill Taylor, and first put into practical shape by the elder Dallmeyer. Practically, "diffusion of focus" is brought about by allowing a certain amount of positive spherical aberration to go uncorrected, and, in the case of the "diffusion of focus" lenses introduced by Dallmeyer, the spherical aberration is introducible at will by the unscrewing of the back lens of the posterior element of a lens that has already been illustrated in the course of these communications.

There has been a great deal of discussion as to whether the introduction of spherical aberration can actually *improve* the definition in any planes or not, and I do not propose to enter into this much-vexed question here. It does certainly, I am convinced, in many cases result in a practically more harmonious picture than results from a perfectly corrected lens, and all that I propose to do here is to try to explain the result of working with a lens not completely corrected for spherical aberration, and to touch on one point in connection with this that has, I think, so far been overlooked.

I use for the illustration of this matter a couple of cuts taken from the PHOTOGRAPHIC NEWS of April 6th, 1888, in illustration of a paper that was read by Mr. T. R. Dallmeyer before the Photographic Society of Great Britain, on "So-called Depth of Focus and Diffusion of Focus."

Figure 1 is intended to represent the rays of light passing from a point O through a lens that is without any spherical aberration, and that come to a focus at I. A point at O is thus represented by a point at I. Points at o_1 and o_2 will, on the other hand, be represented by spots of light of the diameter of the cones of light at i_2 and i_1. Now, as the diameter of a point is zero, the spots of light representing points nearer to and farther from the plane focussed for are, in this case, indefinitely larger than the point representing a point in the plane focussed for, and the contrast is, therefore, indefinitely great.

Figure 2 represents the same state of affairs as figure 1, but that there is, in the latter case, a certain amount of spherical aberration introduced. It will be seen that, in this case, a point at O is not represented by a point at I, but by a spot of a quite appreciable diameter; whilst, on the other hand, the spot shown at i_2 is no larger than where there is no spherical aberration; that at i_1 is not much larger. The *contrast* is thus very much less.

A point that may not be of much practical importance, but that has, I think, been overlooked in all the discussion

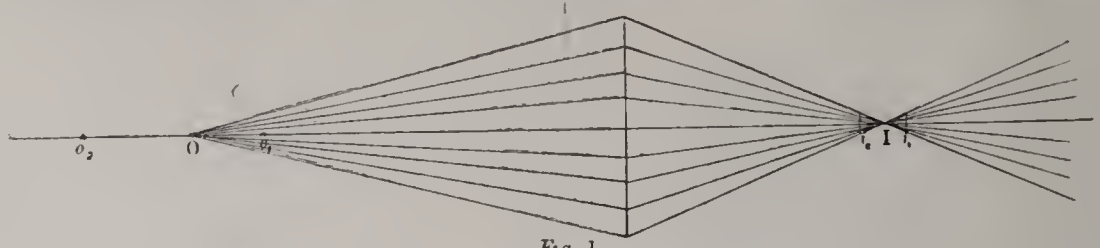


Fig. 1.

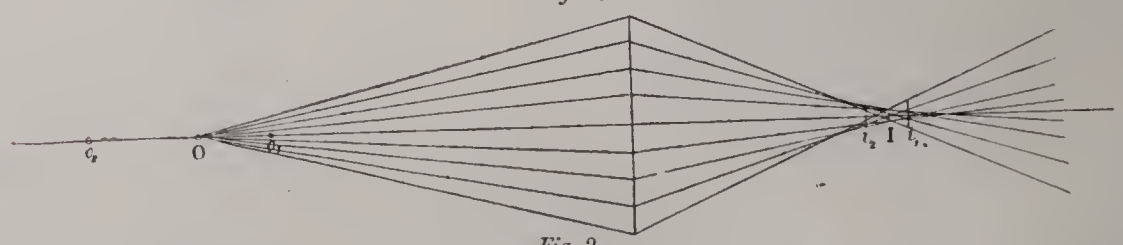


Fig. 2.

that there has been on this question of "diffusion of focus," is this. It has, so far as I know, always been assumed that, in using a diffusion of focus lens, supposing a point to be focussed, the ground-glass will be so adjusted as that it will cut the cone of light where the diameter is the smallest—that is, at I on the cuts that are given above. I believe, however, that in practice this is not so, but that focussing is done more nearly for that part of the cone where the light from the edges of the lens comes to a focus, and that for the reason that a certain increase of diameter means a much greater increase of area towards the edge of the lens than near the middle, so that the *brightness* of the cone at that part where the rays from the edge of the lens meet will be far greater than at any other part, and focussing will be done for that part; where a point in the image will be represented by a very small bright spot with a halo round it, points both nearer and farther off being represented by bright rings filled with a dimmer light. Focussing will, I consider, be done not for the plane I, but somewhat more nearly for that of i_2. I have tried—not very successfully, I fear—to show what I mean in figure 3. I have re-drawn the last figure, but showing the lines that are supposed to represent light, thick in proportion to the amount of light that passes through

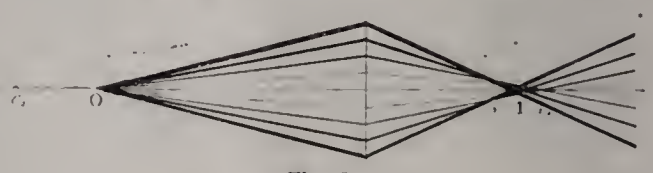


Fig. 3.

the ring that is immediately enclosed by each pair of lines. This light, beginning from the centre, varies with equal increments of diameter, in the ratio of the numbers 1, 3, 5, 7, &c. It will be seen that the greatest concentration of light is between I and i_2. It is already recognised as advisable that, in the case of a lens with adjustable diffusion of focus, the focussing should be done after the adjustment is made. I think what I have just explained is in great part the reason of the advisability.

Diffusion of Focus in Landscape Lenses.—The lens above mentioned as the invention of Dallmeyer, which allows of introducing diffusion of focus at will, is an expensive form

* Continued from page 475.

of portrait lens. It is quite possible, however, with the cheapest form of lens—namely, the single landscape lens—to produce all the effects of diffusion of focus simply by increasing the opening to a certain extent. Thus, a single lens with the opening increased to anything between about *f*/16 and *f*/8, according to the form and the kind of glass used, will give a very soft image, and the apertures mentioned are such as are quite sufficient for portraiture with modern dry plates. In fact, for very large work, there are reasons for preferring the single lens, with aperture opened as described, to any other form of lens.

The only objection to the single lens used as described is that, if we wish diffusion, we are practically confined to the use of a fixed aperture, for an aperture only a little greater than that which will give a pleasantly soft image will give one that is intolerably fuzzy, whilst one only a very little less will give an image quite sharp in one plane. Another objection is that in many cases, especially if the lenses be of second-rate quality, the opening of the aperture gives rise, not only to a certain amount of spherical aberration—which is wanted—but to chromatic aberration also, which is very troublesome.

All this refers to the use of landscape lenses, but for portraiture only. Until lately it was considered that diffusion of focus was of use only in the case of portrait work. I have, however, stated that recently some photographers, whose opinion must be respected on account of the work that they have done, have stated that they think that no part even of a landscape should be quite sharp. Far the best way in which to avoid this sharpness, if it is to be avoided, would be to use a suitable diffusion of focus lens. Unfortunately, no lens with diffusion of focus arrangement suitable to landscape work has, at the time of writing, been specially designed. The "portrait" or "portrait and group" lens of Dallmeyer is not suitable except for small sizes, because, if used nearly full aperture, some parts of a landscape are liable to be put *wildly* out of focus; if even a moderately small stop is used the spherical aberration intentionally introduced by the diffusion of focus arrangement is corrected, and some plane of the subject is represented quite sharply. Even the single lens, if the aperture be opened till there is perceptible diffusion, will, in most subjects, except in the case of small sizes, give some parts of the image far too much out of focus. There is, at the present time, some demand for a landscape lens that will allow of the introduction of quite perceptible diffusion at will, with apertures at least down to about *f*/20. It should not be a difficult problem for opticians to design such a lens, and doubtless we shall have one before very long.

[The table of figures in Professor W. K. Burton's article on the diffusion of focus, published in these pages on June 20th last, was calculated and compiled by Sir David Salomons—a circumstance omitted to be stated at the time because of a printer's error.]

Royal Institution.—The general monthly meeting will be held on Monday, July 7th, at 5 p.m.

Obituary.—The Rev. F. W. Hardwich died a few days ago, and his departure is a great loss to photography. For a long course of years his "Text-Book on Photographic Chemistry" was the chief one connected with the subject, and to this day it holds that position in relation to the collodion process. We also regret to have to announce the death, last Sunday, of Mr. C. G. Collins, the camera maker, who was well-known and respected by the older photographers as well as by those of the dry-plate period.

IMAGINING AND IMAGING.*

BY PHILIP H. NEWMAN.

That is an ingenious idea of Mr. Emerson's where he compares art with the barometer, rising towards naturalism and falling to the abyss of conventionality; and he tells us that if we map it out we shall find on the apices of the ascending curves the masters of sculpture of the Egyptian and Assyrian Lions, Phidias, Van Eyck (a long jump that) Dürer, Holbein, Da Vinci, Titian, Velasquez, Donatello, Rembrandt, De Hooghe, Corot, Millet, Gainsborough. Now I don't suppose he will in the least mind which of these we examine, so let us take Van Eyck, and see what the celebrated "Arnolfini and his Wife" (Mr. Emerson's favourite picture) will prove for him. Now, please believe me, I should be unworthy the title of an artist if I did not admire this painting intensely, and it may be granted at once that you need not be an artist at all to admire it, or to realise its extraordinary merits; they are patent at a cursory inspection; also that it was unquestionably painted from nature, but with Mr. Emerson we will look deeper. I had a tolerable recollection of the picture—as who has not—but I have been to the National Gallery on purpose to study it since reading Mr. Emerson's book, and what did I find? As he says, "It is wonderful in technical perfection, in sentiment, in truthfulness of impression. Note the reflection of the orange in the mirror, with what skill it is painted; it fact, the whole is full of life and beauty, the beauty of naturalism. It is a masterpiece good for all time, and yet it is but the portraits of a merchant and his wife. No religious subject here inspired John Van Eyck, but a merchant family, yet in many ways the picture remains and will remain unsurpassed." Quite so. But there is something more, something that is as apparent to the student as its naturalism, or any of the qualities we have enumerated, something that needs no searching analysis, something anyone may see, something John Van Eyck would have been the first to admit, but which Mr. Emerson has not referred to.

This something, what is it? It is conventionality, style, and without which this picture would not, in an artist's opinion, be the magnificent work of art it is. The folds of the drapery in the wife's robes denote careful arrangement and conventional treatment and drawing, indicative of the style of the period; that due ordination and sub-ordination of parts of magisterial line and breadth of effect discoverable in this school, and manifest in this and other important works of the accomplished master. Undoubtedly this, as in many works of the period in the Low Countries, is wonderful to have been done without the aid of photography, and it would well serve Mr. Emerson, or anyone else, as a text to enlarge upon, as to how photography can be made useful to painters; but he has only chosen to use this illustration to show how Van Eyck went direct to nature for his models; but this needs no insistance. Raphael, and many other painters whom Mr. Emerson abuses, did precisely the same thing, and conventionalised no more than Van Eyck has done (for *pace* Mr. Emerson) I must maintain the picture is brimming with conventionality and style, a style that was carried on among the Flemings to Holbein's time, and is conspicuous happily in his best work. But why does this painting at the end of the middle age period attract our author's notice so much? Is it because he thinks that it at all shows what might be obtained if photography could ever be done in colours? If such is his idea, let me tell him at once that he would be dreadfully disappointed, for he would miss that added charm of individuality, without which no work, pictorial or glyptic, appeals to us or retains our sympathy; that charm that comes of art which is based on a study of nature, but which is a totally different charm to that of *nature*, excepting now and again in her rarest moods, or where man has meddled with but not marred her.

But if a man photographs a field or sea, and paints up to his transferred outline from colour memoranda, and many studies, and never so well, Mr. Emerson is horrified at what he calls a counterfeit, howbeit landscape and sea painting based upon such counterfeiting has reached a higher standard of

* Continued from page 496.

excellence—as mere painting—than at any time in the world's history.

Then what about imagining and imagiug? Where may the two combine, and where, from the camera point of view, must they be friends apart? Mr. Emerson has cut the Gordian knot, but he has not solved the difficulty; he ridicules an ideal, excepting what may come of itself out of nature, so the art of difficulty, as far as he is concerned, remains precisely where it was. The faet is, each of us must solve the difficulty for himself, and in his own way. If he be a genius he will have little trouble; if he is not, he will save himself many plates, much chemicals, and more disappointment if he looks up some of the authorities our author affects to despise; and whether the photographer be a genius or not, it will be just as well for him to see where others have succeeded and where failed. Amongst these he will, of eourse, come across Rejlander, and will see that he kept imaging and iuagining together to a very wonderful extent indeed, and he only failed because of his models. If he could have obtained some of the models Phidias and Apelles could get, the history of photography would have been as great in æsthetics as it is in science. Photography is not to blame for this; she must be content with the models she can get, and do the best she can with them; and very much she cau do, if the artistic faculty is cultivated (if not native) by a searching study of the old masters of form, sentiment, and composition, and especially if the photographers will abstain from short-focus lenses, and can be persuaded to burn all their small stops. Bad photography has a great deal to answer for in the multiplication of copies of iuferior work, leading our attention to detail rather than to breadth and simplicity, which should be the characteristic of all art, pictorial or glyptic. False notions of taste must, of necessity, be encouraged by such multiplication, especially in those less cultivated minds which look upon every photograph as a picture. This alone should stimulate every photographer to strive for the best from an art poiut of view.

The matter of detail has affected the arts of design and picture painting alike, and very importantly; its influence is discernible in every exhibition, and is distiuctly a bad one in the true interests of art. I am glad to think that my views coincide with Mr. Emerson's on detail in art work, and agree with him as to its limitations to that which is fundamentally necessary. I have alluded to this question of detail in auother lecture,* but I feel its import so greatly as to dwell upon it with renewed emphasis here.

The tendency of artists to paint bits, and amateurs to purchase them, was never so great as in the present day. Nothing could be said against it were these bits looked upon —as they should be—as merely a means to some great and legitimate artistic end; but when one is deafened by the parrot cry of "Nature, nature, nature!" one is apt to lose patience and ask, Why is this aimless sort of thing going on—this painting of elaborate passages in nature, with subtle reflections and interminable detail that tell us nothing but that in competition with the camera mau's eye aud brain are inferior instruments, if the product is to be looked at as the true end of fine art? Well, I do not believe it is, or ever will be. We are passing through phases of change; if the camera has stimulated some of our younger painters to study nature lovingly and searchingly, they must look upon it as a means to an end; and while they may be congratulated on escaping the far more dangerous Charybdis of a tricky impressionism—as demoralising as it is false—they must avoid the Scylla of sacrificing breadth to detail. The image should on no account content them unless it bodies forth their highest thoughts and aspirations and most poetical ideas.

People talk of realism and idealisu, impressionism and naturalism, fashionable verbiage that only conjures up the ghosts of thiugs in art; they seem quite to forget, or to ignore, that these *isms* are but the robes of art, the fanciful draperies with which the goddess coquettes with all but her true votaries, or illusory fires with which, like a will-o'-the-wisp, she leads a purblind and bungliug *dilettanteism* into the bogland of cant and empty phrases. No! art is uot got on easy terms; she is ever a coy goddess; but when you can unveil her of these *isms*, and you are really face to face, you will find her the same to-day as she was far back across the dim centuries to your predecessors—fair, modest, truthful, with wide, honest eyes, searching the hearts of man, sounding the intellectual depths of struggling human nature, telling truths calmly, piously, earnestly, affording her true worshippers most gracious and pleasant consolation, and ennobling them for ever. I warn you that art that does not do all this is not true art, but one of those weird lights that will drown your soul in a quagmire.

Mr. Emerson is exceedingly bitter on the religious side of art. We, of course, must all regret as much as he that priest-eraft at many periods did put it in fetters, but, without being fanatical, it is possible and just to be grateful to the religions of the world—heatheu or Christian—for creating and preserving to us the monuments that exist. It may be weakness, but I am none the less proud of it, that when I stand before the cathedrals of this country, or northern France, I am thankful to be alive to see them, and to know that the bishop builders have formulated for me a prayer in stone. Am I, are you, to put these thiugs by as toys of a puerile age, and say, "All sentiment, my dear sir? Art teaches us better now; the bishop builders were all very well in their way, but the French Revolution, plus the Zolaciples, gives us a truer gospel, don't cher know; you'll see it through the camera if you'll only stick to nature." I often wonder if men who practically say or think this sort of thiug know anything about art at all; they certainly don't expect art to say anything to them or teach them anything. One says to you, "I don't want the story at second-hand; I know the page of Lempriére the artist got it from;" and so, forsooth, because he has not inveuted a legend he is not to paint it. Because he has never seen a hero he is not to imagine one, and give pleasure and instruction to a less imagiuative brother by a picture for fear the brother should ask, "Are you sure it all happened just so?" or say, "Of course you photographed the hero, dear boy."

Fancy a painter being commissioned for a picture or fresco of *Prudence* for the adornment of a town hall or law courts, and being prohibited froin using the admirable and instructive subject of *Ulysses and the Syrens* because the painter—let him be able to paint ever so poetically—did not invent the story, and could not get a photograph of the syrens. Again, and for similar reasons, I am not to buy a *Perseus and Andromeda* to hang upon my walls, do I want a lessou in chivalry never so much. Some of the rising painters have laid these teachings somewhat to heart, and to their cost, for, instead of boldly taxing their imagination, they have tried to make a compromise between nature and art. A most ludicrous instance of this is present to my mind, where the subject painted was this very *Perseus and Andromeda* naturalistically treated; the figures were fairly painted, as paintings, and undoubtedly extremely like the models, but these, of course, were of such a poor and uuheroic type as to suggest that they had by some means been deserted by their bathing machines. The monster was too flabby to describe. Another *Andromeda* occurs to me; here the painter had exercised all the imagination he was capable of, and had used his model so judiciously as to obtain a fine figure; yet his mistake was as grave as in the former case. This *Andromeda* seemed, excepting for her silver handcuffs and chain, to be sunning herself after the bath, while the emerald waves and purple islets suggested a strand where monsters never came and chivalry was scarcely needed. The poetical insight wanting in these instances might serve to support Mr. Emerson's argument against painting such subjects, did we not know that it has been painted worthily more than once in our own time; and, above all, remember that while painters are many, artists are, and ever will be, few.

(To be continued.)

* See PHOTOGRAPHIC NEWS, March 7th, 1890.

THE PHOTOGRAPHIC CLUB.—The subject for discussion on July 9th will be "Photographing Theatrical Scenes;" Report of the Convention Delegates. July 16th—"Iron Printing Processes." Saturday, July 12th—Outing at Rickmansworth; train from Baker Street at 2.16.

NOTES.*

BY COLONEL J. WATERHOUSE, R.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

Eikonogen Developer.—Some eikonogen, lately received from Europe, was on arrival in crystals of a pale yellow colour, quite free from brownness; but, in the course of a few days, it gradually turned of a deep brown purple colour, though kept unopened. This coloured coating dissolves easily, forming a solution of a strong brown-madder colour, leaving the clear crystals, which are not so soluble.

For developing, the solution recommended by the maker in the printed instructions given with the eikonogen was not found to answer. A better developer is that given by Dr. J. Nicol in the *American Annual and Photographic Times Almanac* as below. It works well with Wratten's plates and with Eastman and other films. The formula is—

A.—Eikonogen	... ...	5 grammes or ounces
Sodium sulphite	...	10 ,, ,,
Water	... ...	100 cub. cents, or fl. oz.
B.—Sodium corbonate	...	7·5 grammes or ounces
Water	... ...	100 cub. cents. or fl oz.

For ordinary use, to one part of *A* and one part of *B* add two parts of water; but the proportions may be varied, density and contrast being increased by adding more of *A* or less of *B*, or *vice versâ*. Bromide is not necessary, but in hot weather a little would probably be an improvement.

When solution *A* is made with the fresh yellow crystals, it has only a pale yellow or greenish colour; but if the crystals have become brown, the solution is a dark green, becoming gradually darker by keeping, especially by access of air. It should, therefore, be kept in well closed bottles filled up. The mixed developer has a yellowish colour, and does not become very dark by use. Several plates can be developed in the same solution, a little fresh being added if necessary, or the plate may be transferred to a fresh bath to bring out detail in deep shadows. In some cases a better method will be that described by Mr. B. J. Edwards in this year's Year-Book of Photography, of first developing with a normal developer to bring out detail, and then finishing off and gaining intensity by a similar developer with a full dose of the developing agent restrained by bromide, because the eikonogen seems to have a tendency to give a thin image full of detail, and special treatment may be required to give force and brilliancy.

The above developer works very cleanly, and is quite free from any tendency to stain either plates or fingers. With it, as with other developers, the character of the result seems to depend on the idiosyncrasy of the particular make of plate used, though this does not appear to be so much the case as with hydroquinone. On the whole, eikonogen seems likely to be a valuable addition to our resources, especially for instantaneous work, and probably for developing paper prints.

Eastman's New Films.—The new transparent film for use in roller slides, brought out by Messrs. Eastman and Co., has many good qualities, but several improvements must be made in its manufacture before it can be considered perfect.

It appears to be made from a solution of pyroxyline in acetate of amyl, with the addition of a large proportion of camphor. As was pointed out by the writer in the Photographic News in March last year, collodion prepared with acetate of amyl gives a very structureless, tough film, and it was suggested that such a film would be very suitable as a support for gelatine emulsion, as the new Eastman films show it to be. These films are beautifully clear and colourless, showing only a very slight colour on white paper, but unfortunately they are full of small specks of dust or undissolved material, which cause lumps on one side of the film and corresponding hollows on the other. The slight want of contact may not be of much consequence in printing, but for all enlarging purposes these spots greatly diminish the value of the films, and would ruin the appearance of the prints from them. At present the writer has only used the films in the ordinary Eastman carriers, cutting off pieces of film from the roll as required; but it is difficult to get them to lie flat in the carrier frames, and the thicker celluloid films are much better in this respect. The films are very sensitive, and work clearly and well with the eikonogen developer; they stand a high temperature fairly well without ice or the alum bath, and give very perfect sharpness of detail, more so than the matt-surfaced celluloid films. Some of the writer's negatives show another very peculiar defect, a kind of branch-like markings all over the image, but specially noticeable in parts of an even medium density, such as sheets of water, and they may most easily be seen crossing the blank margins, where the film has been protected from the light by the carrier frames. This defect has, the writer believes, been noticed in some of the journals, and attributed to electrical action, an assumption which is well warranted by their appearance; but how the markings are produced, whether by tension or strains caused in rolling the films on the spools, or in stripping them from their original supports in a very dry atmosphere, there is nothing to show. If a piece of film be cut off the roll and developed without being exposed to light, the marks may be seen very clearly in branched and single lines running in the direction of the length of the films. They have the appearance of being produced by faint sparks. A piece of the film crumpled up strongly in the hand, then opened out and developed, showed no such marks due to the crumpling, nor did pulling out the film strongly in jerks show any; though in the present very damp state of the air here it would be difficult to excite electrical action. The marks seem to occur only in patches on the films. It is to be hoped that their cause will be discovered and removed.

Notwithstanding these defects, which seem likely to be easily remediable, the new films promise to be an enormous improvement over paper films in the roller slide, for which they are specially adapted. The writer has found that paper films fail entirely in cases when they have to be kept a long time between exposure and development, and are practically useless for travellers and explorers unless they are developed immediately or within a month or two of exposure. The writer has not had a good opportunity of testing the keeping qualities of exposed celluloid films; but he has found that the films themselves lose much of their original sensitiveness by keeping even a few months. Some very sensitive American films which were received here in August last are now only of an ordinary sensitiveness, but otherwise good. No particular precautions have, however, been taken in keeping them, and they have been taken to Europe and back in the time.

* From the *Journal of the Photographic Society of India.*

Notes.

Advertising detective agencies move with the times. One advertises in this fashion: "Instantaneous photography for secretly securing photographs of persons when together or separately, for identification and corroboration." We are rather inclined to think the advertiser, like the lady in the play, protests too much. "Instantaneous photography for secretly securing photographs of persons when together or separately," is all very well in theory, but difficult to reduce to practice. Still, we do not doubt the possibility in a good light. It would be instructive to have the experiences of the operators in the employ of the detective agency; at the same time, it is quite possible (if a story coming from Paris be true) to turn photography in such cases as are hinted at in the advertisement to a questionable use. The Parisian story is, that an Austrian gentleman, after dining at his hotel, went out to enjoy a walk in the *Bois*, and, suddenly remembering an appointment he had made, summoned a cab to take him in the direction he had to go. He had not been in the cab many minutes before it stopped, and a man entered it quickly, and closed the door behind him. Before the Austrian had time to cry out, a handkerchief saturated with chloroform was held to his face, and he became partially unconscious; the next thing he knew was that he was in a room, and was being photographed by the electric light. The explanation of this mysterious business is that the gentleman's wife was anxious to obtain a divorce from him, and to bring about the object she took steps to obtain a photograph of her husband. All, then, that was necessary for the fabrication of an accusing picture was to procure a photograph of a notorious lady, and to combine the two pictures, "which," says the paper relating this veracious story, "could be easily done by an ordinary photographer." We should say that there was about as much truth in this story as there is in the efficacy of the photographic appliance advertised by the detective agency.

It is impossible to commend the use to which an American firm of publishers has applied the art of photography. They photographed the pages of the "Encyclopædia Britannica," and from the photographic plates printed and sold a spurious edition. Fortunately, some of the articles were written by Americans and copyrighted in America, and thus Messrs. A. and C. Black, the owners, were able to proceed against the infringers of their rights. It is curious to note that the point upon which the English firm was able to obtain judgment was also made use of as a defence, the defendants contending that these articles by American writers were nothing less than a trap laid for the American public and American publishers. If this be so, all that an impartial person can say is, so much the better.

Lenses whose behaviour is eccentric are not unfamiliar to photographers. A lens which has hitherto borne an irreproachable character has been known to refuse to come to a sharp focus, and to otherwise annoy its owner. Indeed, one well-known photographer in such a case has been heard to express an opinion gravely that the lens was drunk. However this may be, a microscopical objective seems recently to have behaved in a most extraordinary manner, as the proceedings at the last meeting of the Royal Microscopical Society will show. It appears that a committee, consisting of Mr. Mayall, Dr. Dallinger, and Mr. E. M. Nelson, had been appointed to examine a new objective in which great interest was manifested, and a report was to have been submitted to the members at the last meeting. The committee, however, failed to bring up the report, and for a full and sufficient reason.

Mr. Mayall explained that when the committee proceeded to test the objective by photographing an object, they found, to their disappointment, that the visual and actinic foci were not coincident. However, by guessing what focal allowance to make, they succeeded in obtaining out of the out-of-visual-focus a very nearly sharp photograph. But as this want of coincidence would have made the lens very inconvenient to use, they returned it to Jena for alteration. After a lapse of several weeks Dr. Czapski, of Jena, replied that he had not found any trace of a "chemical" focus non-coincident with the visual focus, and the objective was again forwarded to London. Again the committee went to work, and this time the visual focus agreed with the focus in the photograph. In fact, as Mr. Mayall remarked, the transit of the objective from London to Jena had somehow got rid of the "chemical" focus. This, to say the least, is unsatisfactory, and we would have wished that some other explanation had been given. The Microscopical Society evidently were not equal to the task of solving the mystery, and unless the theory of the photographer mentioned above be accepted, it is difficult to account for the abnormal condition of the lens in question.

A curious experiment in what may be called stereoscopic science has been made by Dr. Schobben, a member of the Antwerp section of the Belgian Photographic Association. Recently he exhibited before the section a series of stereoscopic views shown by two lanterns placed side by side. Each lantern contained half a stereoscopic view, and a coloured glass was placed in front of the lens, red for the view on the right-hand side, and green for that on the left. The views were then thrown on the screen, and the spectator looked at them through a pair of spectacles with red and green glasses (red for the right eye, and green for the left). The result was, it is alleged, that the spectator saw a *non-coloured* image with as much relief as in the stereoscope.

Here are a few foreign items which may not be without interest. A new photographic society has been started in Amsterdam. Photographs are admissible at the forthcoming exhibition of architecture in Italy.

This, by the way, is the first of the kind ever held in that country. The photographic exhibition which has been in course of organization at Grenoble was opened on Tuesday, and will close on the 30th of August. A very admirable specimen of photo-collography by M. Balagny is presented with the June number of the *Bulletin de la Société Francaise de Photographie*. The subject is a view of the interior of the Paris Exhibition.

A smart piece of work was done by a newspaper agency over the appointment of Sir Edward Bradford, the new Commissioner of Police. The secret as to the successor of Mr. Monro had been well kept, and until the announcement was actually made in the House of Commons on Friday night no one knew anything of the matter. Yet the early editions of the evening papers of the next day contained a very fairly-executed portrait from a photograph. Possibly Sir Edward knew what was in store for him when the appointment was made known, and had his photograph in readiness for the journalistic artist.

A Boston blacksmith has made a discovery that may revolutionise the arts of photo-engraving, electrotyping, and even type-setting. He has found that pen-and-ink sketches on common writing paper can be transferred to iron as distinctly as if the mould was of greater size. Two plates, one 3½ by 5 inches, and the other 5 by 6 inches, are shown by him as a proof of his ingenuity. Upon the smallest one is written the Lord's Prayer, the letters being quite distinct. The others contain outline drawings. He explains his work in this way: "What you see on them is done with a common steel pen on a piece of thin paper. The paper, when prepared, is pinned into a sand mould, iron is poured into the mould, and the writing is transferred to the casting." The explanation is not quite so satisfactory as one could wish. As the white rabbit said in "Alice in Wonderland," "there is a good deal to be done first." What does the inventor mean when he says, "the paper, when prepared?" How prepared? He seems to have missed what, probably, is the most important part of the process.

We were told lately by a well-known manufacturer of photographic apparatus that there is an extraordinary demand for detective cameras this season, and that although he had a large staff of men at work on these articles alone, he could not keep pace with the demand. It seems incredible to those who are not experts that this instrument should have become so popular, and yet that it should not fulfil its destiny and justify its name by being used by our police force for the detection of wrong-doers. At one time there were hopes raised that by its deterrent aid crime would become almost extinct. But all good photographers know well that this blissful state of things will never come to pass through the aid of secret camera work, unless, indeed, the criminal classes will consent to pose themselves on sunny days in front of the instrument. Our weather is too precarious, our streets are too dark, and our quarry is too sharp to enable us to execute any such work in a haphazard kind of way.

Gelatine plates are usually of such excellent quality that few failures can reasonably be ascribed to them. A case was, however, brought before our notice the other day where a raw amateur had complained to the maker of one of the best brands of plates in his market, that several of his pictures had been spoilt by pinholes in the film, and he sent one of his negatives, with his letter of complaint, as a guarantee of good faith. The maker was able to prove, by raising a portion of the film from the glass, that it contained no holes, and that the clear spots on the surface were due to careless development. Many workers are apt to forget that certain samples of gelatine are at first most repellent of water, and that it is a wise precaution with all plates to use a soft camel-hair brush, in order to establish contact between film and liquid.

The "Obernetter" adds yet another film to the many which are now on the market, and it appears to be a preparation of gelatine rendered insoluble, and to resemble celluloid in all its good qualities. We trust that it will be found possible to sell it at a price which will approximate to the price of ordinary dry plates, for the great difference in cost between celluloid and the plates which it aims at superseding is the chief stumbling block to its use. Another consideration which at present bars these films is the difficulty of adapting them to apparatus which has been made to accommodate glass plates without a considerable amount of trouble and inconvenience. Modern workers lack the patience of their forefathers, and will not be troubled with difficulties if they can possibly help it, but still the £ s. d. matter is the one which they consider most.

Photographers who have had leisure on their hands, and who have not been obliged to consider too much the bread and butter side of their work, have often produced amusing puzzle photographs. These have generally consisted of such subjects as a man playing chess with himself, or a person holding his own head in a dish, and so on. Most photographers know how such things can be done, but few would imagine that the pictures were possessed of any marketable value. A certain transatlantic worker thinks differently, and he advertises that he will show all his hanky-panky tricks—which he calls "freak photography"—for a compensatory number of dollars. This is quite excusable in an American, for it is well known that he can see money in a thing where a Britisher would discern no glitter of hope. It was only the other day that a report reached America that Sarah Bernhardt might possibly have to lose a leg by amputation. An American speculator immediately wired that he would—if the event came off—give a long price for the limb and the sole right to exhibit it. We slow Britishers would never have thought of such a thing.

PHOTOGRAPHIC EXHIBITIONS.

BY GEORGE DAVISON.

No. V.—Hanging Committees and "Amateur and Professional."

It is a necessary consequence of any system from which picture classification and prizes are banished that there should be a strict and competent hanging committee, which should reject all inferior exhibits without fear or favour. The best committee would consist of those held to be qualified judges, provided that some or all of them possessed practical experience in arranging and hanging pictures. As compared with the task of selecting those pictures which possess artistic qualities, it may seem comparatively easy to weed out what is distinctly inferior, and a board consisting of ordinary practical photographers might, perhaps, do this with fair accuracy. At the same time, it must be remembered that the functions of a hanging committee are by no means limited to rejection of the worst entries. They also include distinguishing in a broad way the degrees of merit, to ensure that a picture of the highest quality shall not be placed in an inferior position. The best exhibition would undoubtedly be one in which only such work is accepted as would be worthy of a place on or next the line. Pictures which are held to be fairly treated by "skying" or "flooring" ought not to be accepted at all. It is a common thing to hear even the exhibitors themselves say that they would rather not have their pictures hung at all than have them put out of reach of inspection.

It is essential, then, that there should be amongst the members of a hanging committee those who are free from what may be called photographic prejudices; that is, those who, with or without a knowledge of photography, would judge of the entries purely as pictures (as a poet might judge of poems) without consideration of the mechanism employed, and exactly as they would judge of a series of exhibits in any other black and white process better recognized in art. A photographer is by no means unlikely to pass by a work with the highest artistic qualities as even unworthy of a place in the exhibition, if it happen not to be marked by any sensational effect, or by what is peculiarly known amongst us as "technical qualities." There will, no doubt, be very few pictures having the highest qualities for the hanging committee to be troubled about, but they ought to be competent to deal with those that do appear, and it is in the hope and expectation of seeing more such perfect pictures by photography in the future that such lines as these are penned.

Where space in an exhibition is practically unlimited there is much scope for pleasing arrangement. One thing, however, must be kept prominently in mind, that it is the pictures that have to be seen, and not the accessories or the scheme for displaying the exhibits. Art in displaying exhibits must be concealed.

Where the frames abut one upon another throughout an exhibition an unobtrusive arrangement may be made which approximately gives the effect of panels. To hang such an exhibition sucessfully means that the director should first of all know well, and partly divide out, *all* the pictures he has to deal with. The work is best done where the whole of the exhibits in a section are arranged by one individual, and not piecemeal by several. The after labour and difficulties are reduced two-thirds if *the whole* of the pictures can be mapped out upon the floor before any one portion is actually fixed up. The prior selection of those which are to occupy the principal central positions, and along the best line of sight, is at least essential. A large treatment is called for, and, at the same time, throughout the operations close consideration has to be given to points of detail in regard to harmony and symmetry and quality of work. Hanging committee duties are probably sometimes taken up lightly without any conception of the responsibilies or of the powers called for in such a function. There are very few men who are absolutely deficient in taste, but in some cases pictures have gained attention and superiority of position from such "hangmen" purely from their size and wealth of gilt moulding, or from good selling characteristics, and this without any consciousness of error.

In the work of placing pictures, constant vigilance and energy are needed, and, for the effective and satisfactory hanging of a large room or gallery, the "artist-hanger" must have all the exhibits in his mind's eye, and must not object to physical effort and frequent experiment. In regard to some few details it may be observed that the general practice affects large pictures in two ways. If they are held to be good, they are selected as centres; if bad, they are skied. On either hand of the centres some approximation to symmetry by arranging pairs, or similar blocks of frames, is arrived at. It has become the custom for exhibitors to desire to have their pictures, particularly if small, hung together; but it cannot be of any importance to a collection of *pictures* that they should be all together, although it is advisable for a technical series. A *picture* should be in a frame by itself. In the scientific section, which a hanging committee does well to keep entirely distinct, or in a portion of the gallery by itself, the difficulties are not, perhaps, so great. The exhibitor decides by his entry form whether he wishes to enter his exhibit as of scientific interest or as a picture, or if he does not do so the committee can easily do it for him. When exhibition authorities are alive to the proper method of working a high-class scientific exhibition, specialists might have to be called in, but at present the purely scientific applications of photography are very little illustrated in our exhibitions.

Another regulation which, at the outset, I proposed as a plank in a good programme for an exhibition of art photography was in regard to the peculiar division sought to be set up between amateur and professional. My proposal was, "That all distinction of amateur and professional be entirely suppressed in such an exhibition, all pictures being for sale unless specially exempted."

If it were possible that there could be a class of wealthy workers fully devoted to photography and to developing its highest possibilities other than as an avowed profession, nothing could be better; but this, as in other arts, we know to be an impossibility. A class to do the highest good must be professional. Dilettantism never yet helped on any cause very far. Busy men who take up photography merely as a pastime cannot pretend to show what can be done by its means. Neither, of course, can those who work at photography in the ordinary studio and topographical grooves. Art knows no "amateur and professional," save to express by it badness and goodness. The absurd restriction involved in the distinction between amateur and professional prevents photographs being sold at exhibitions. If the photographs were good pictures, they would be demanded and sold.

Those of us who pride ourselves on being amateurs seem to be claiming credit for the hopeless mediocrity and the worthlessness of our photographs. This system tends

to keep photography low in general estimation. People ask with unblushing readiness for the gift of a photograph. Like most things cheap, they are also considered nasty. Much of the value of a work is given by that which the producer puts upon it himself. Everyone interested in photography must hope to see more and more photographers whose work is worthy of it publish their pictures in some form creditable to the art. Only let them take competent opinion before doing so. The rubbish that is sometimes sold in exhibitions and published in our journals —particularly, I fear I must say, in those of our American friends—cannot fail to do great harm by exciting ridicule at the expense of photography.

In regard to regulations for photographic exhibitions, the removal of classification would, of course, sweep away the absurd division of amateurs and professionals. If competition is unfair (which it is *not*) between those with studios and those without, so much the worse for competition. Let it be done away with. The artist wishes to see the best; the interests of photography call for the best. There can be no defence for giving awards to a class because the work of those composing it is *not so good* as that of another class.

THE RECORD OF PHOTO-MICROGRAPHY.*

BY ANDREW PRINGLE.

It may, perchance, be matter of wonder as well as of interest to some of you that the history of general photography has been, to a great extent, bound up with the history and record of photo-micrography; not that the special application of photography to microscopy has in any direct way influenced general photography, but rather because the men trained by education, and perhaps fitted by nature, for microscopic study, which is equivalent to saying minute and accurate observation have found photographic *technique* useful, and have turned their observant minds to photographic wants.

And, moreover, images projected by a microscope are so evidently convenient for the study of any method of graphic representation—the enlarged image can so readily be kept steadily fixed on one plane, the optical qualities of the projected image can be so readily examined, the worker is so wholly independent of weather—that there is not much cause for wonder in our finding some of the earliest experimentalists in photography using the projected microscopic image as the subject for their photographic researches. Last year I had the honour to review before you the progress of photography during fifty years, but this year I take you back, if you will be pleased to accompany me, to a period more remote than fifty years ago. Let us turn to the year 1802, and we shall find—probably in the journal of the Royal Institution—records of the experiments of Wedgwood and the observations of Humphry Davy on "Leaves and Wings of Insects taken by Solar Light on Prepared Leather." This surely is early enough in the history of photography. It is well known that both Fox Talbot and the Rev. J. B. Reade used the solar microscope, and many other names famous in the records of photography are also found in the early annals of photo-micrography. Mr. Reade is known to have produced photo-micrographs in 1837, insects being his chief subjects, but in 1839 he produced results greatly superior to his efforts of 1837. About 1838 the prototype of our triple achromatic condenser was brought forward by Dujardin, and in '39 or '40 Dancer used the gas microscope and photographed therewith on silvered plates. Donné and Foucault, in Paris, presented engravings from photo-micrographic Daguerreotype plates in what Moitessier called a "magnificent atlas." The first instance known to me of the use of polarised light for photography was in 1857, when M. Bertsch exhibited in Paris crystals of salicine photographed by polarised light. About the "fifties" a great many names are found, many of them well known to us, as Shadbolt, Diamond, Maddox, Wenham, Viles, besides many *savants* of other countries. Dr. Maddox showed at the Royal Society, in 1867, photo-micrographs illustrating a paper he then read.

Enormous strides were made in our science by Dr. Woodward, an army surgeon of the United States; in fact, his work may be said not only to mark, but to constitute, an era in photo-micrography. His work first claimed notice about 1864, and consisted not only of medical subjects, but of diatoms taken at very high magnifications.

I am not aware of the exact date when Dr. R. L. Maddox first produced a photo-micrograph, nor can he fix the date himself, but I have here a photograph of P. Angulatum × 3,000 diameters of superlative excellence produced by my friend in 1838 or 1839. This was by no means his first attempt, as is easily seen from the high quality of the negative now in my possession. It is not within my subject to describe even briefly the apparatus used by these early workers, but I may say that the illumination used by them was either the gas microscope or sunlight, and many ingenious forms of heliostat were used. Dr. Woodward's heliostat was specially admirable, and Dr. Maddox designed one of high quality and moderate price. Still, in this country at least, direct sunlight can never be depended upon, and in the days of wet collodion the photo-micrographer must have had frequently to lie idle. In the present day, with the much more sensitive plates at our command, we can utilise as radiants not only the electric arc, but electric incandescent lamps, such, for example, as Dr. Van Heurck uses with such success; limelight, such as I use myself; and even the light of ordinary paraffin lamps.

Perhaps I may be excused if I dwell with a certain fondness on the photography of bacteria. I believe that Dr. Robert Koch, the eminent bacteriologist of Berlin, was the first to publish photographs of bacteria; this was in 1877. In his paper "On the Investigation of Pathogenic Organisms," translated by Mr. Victor Horsley for the New Sydenham Society, Koch speaks very strongly in favour of photo-micrography, and even says he would prefer a bad photograph to a drawing, however good; but it seems that at a later period he found certain difficulties of colour to be almost or quite insuperable, and he was then inclined to make less of photo-micrography than he had previously done. Dr. E. Klein, F.R.S., was also inclined to condemn our science for his purpose, for in "Micro-Organisms and Disease," third edition, 1886, I find these words:—"Micro-photography, by which microscopic specimens of bacteria are photographed, has hitherto yielded results so unsatisfactory that even Koch, who first introduced it, has abandoned it in lieu of accurate drawings made in the usual manner." Possibly, when Dr. Klein wrote this his words were true, but certainly he has changed his opinion now, as I have very good reason to know.

I could name a considerable number of books and a very great number of papers which are illustrated by photography. George M. Sternberg not only illustrated a book of his own on bacteria by photo-micrographic prints, (second edition, 1883), but has written a book of careful and detailed instructions for the practice of the science. Dr. E. M. Crookshank is in the same position; he has published a book largely illustrated by photographs of bacteria, and he is also the author of "Photography of Bacteria." A paper read by Dr. Crookshank to the Photographic Society of Great Britain, and illustrated by his negatives, first directed my attention to bacteriological photography. In 1885 both Hauser and Van Ermengen published photographs of bacteria, and after the works of these men the science may be said to have gained a sure footing; the chief obstacle to success, the stumbling block of all these earlier workers, was the difficulty of *colour* rendering, unless the preparations were suitably or deliberately stained for photography. Colour-correct photography, then, forms one of the foundation stones of the edifice of photo-micrography so rapidly rising among us.

My remarks up to this point have been purposely made to lead up to certain stages in the records of photo-micrography, and we have reached the stage of colour-correct rendering of stained objects. There is another photographic

* Read at the Photographic Convention at Chester.

matter which has been alluded to in passing, but must now be more particularly treated. I have referred to increased sensitiveness of our plates. Just as Wedgwood, Davy, Reade, and Talbot used photography for microscopic work, and in practising the one elaborated the other, so Dr. Maddox, in the search after certain photo-micrographic effects, fell upon gelatine emulsion photography. I need not tell you how Bennett revolutionised photography, but I must point out the effect his discovery had on photo-micrography. We are no longer dependent on sunlight; we can work with the very highest powers without undue length of exposure; the developed image is quite fine enough for any purpose; and nearly all the difficulties and inconveuiences of wet collodion and silver bath are removed from our path. The advantage in reduced exposure is not by any means a matter of time only, for, during prolonged exposure, there is imminent danger of movement either from tremor or from alterations of temperature, both of which are fatal to success, but most difficult to avoid. We have, then, at the present day, advantages purely photographic which were not within reach of the masters of photo-micrography of past years; we have plates much more sensitive, aud so we get results much more rapidly, much more certainly, and with much less expense; but in a large class of cases we get results much better—sometimes, in fact, we get results which, without orthochromatic photography, we could not obtain at all. The indefatigable Koch was stopped by colour difficulties, as already stated; but it is interesting to know that, so far as I have seen, the very best photographs of bacteria published up to the present time are by Drs. Fraenckel and Pfeiffer, colleagues or assistants of Koch. These bacteriological photographs are so fine that I have brought a few of them for your inspection. They are all, or nearly all, produced by orthochromatic methods, and while I cannot quite agree with all the directions given in the text of No. 1, still, there can be but one opinion as to the results these gentlemen have achieved.

I would point out that some of the methods of staiuing most followed by bacteriologists and microscopic technologists in general would afford excellent examples of subjects difficult to photograph on ordiuary plates. *Tubercle bacilli* are usually stained either red on a blue ground, or blue on a yellow-brown ground. Violet coloured *bacilli anthracis* are very frequently found in preparations counter-stained with Bismarck brown or vesuvin. The fungus of *actinomycosis* shows best stained blue, red, and yellow, and I shall presently show you the orthochromatic results from such a staining. A much valued multiple stain—my own favourite stain for ordinary pathological aud physiological tissues—consists of bright blue for nuclear, bright red for connective, and orange more or less bright for proto plasmic tissues. I venture to assert that no ordiuary plate will properly render a section well staiued by this method, yet with yellow-sensitive plates, and the use of screens chosen for each occasion, I am in the frequent habit of photographiug such subjects, and I generally end by getting good results. I could show you bacteria sections photographed repeatedly on ordinary plates, and with the greatest skill and care I could bring to bear, where there is not a trace of a microbe; whereas with a colour-corrected plate the organisms stand out clear and unmistakeable. My paper is not intended to be a course of instruction in photo-micrography, but is rather an attempt to point out by how much and by what means our science has advanced, is advancing, and will doubtless continue to advance.

The advances made since the infancy of our science have been simply astounding. Conceive the time and conceive the labour when the principle of "correcting lenses for photography" was undiscovered. Petzval, about fifty years ago, showed the way to this correction in photographic lenses, but not till long after that did photo-micrography become so important in public estimation that opticians were forced to consider the correction for microscopic objectives. Some opticians do not seem to have grasped the subject even yet, but there are others who have done so most successfully.

And again, resolution aud definition, which, though perhaps technically distiuct, are nevertheless bound together, depend on angular, or rather, numerical aperture. The earlier opticians might get their objectives with visual and chemical foci coincident, they certainly did attain to very flat field images; but they were incompetent, and, indeed, do not seem to have been desirous to get large aperture with other qualities good. Resolution, or separation of line from line, depends on fixed laws relating to numerical aperture. A lens having a numerical aperture of 0·30 will, in the most actinic part of the spectrum, resolve 38,000 lines to an inch; N.A. 1·00 (the highest air angle) gives the power of resolving 127,000 to the inch, while N.A. 1·4 is capable of resolving nearly 180,000 per inch, Now many of us possess objectives having apertures nearly approaching to N.A. 1·4, while lately Zeiss produced a glass having a numerical aperture of 1·63. I shall show you some work done with this glass by Dr. Van Heurck, of Antwerp.

When the system of immersion was introduced an enormous stride was made, and an enormous additional power gaiued. If we have a dry lens our numerical aperture is evidently limited to the extent of the air angle—180°, or n.a. 1; but when water immersion was introduced, and still more when homogeneous immersion, the numerical aperture was at once increased to a very large extent. It may seem a paradox that we can get a glass to embrace a larger angle than 180°; at first glance this seems to bespeak looking round a corner, but the explanation is simple enough. We do not look round a corner, but in our angular aperture of 180° we include more pencils of light. If, for example, with a dry lens we can include 1,000 pencils, we can with water immersion (by virtue of the higher refraction index of that liquid) include 1,300 pencils, and with suitable oils 1,500; while, if we use not only suitable oil, but suitable glass for our condeusing arrangements, we can, as already stated, reach to 1,600. But, beyond this gain, immersion greatly improves the qualities of our objectives; it increases working distance, improves illumiuation, and mitigates the tendency to diffraction images.

Herein, theu, lies one of the great advances made in our optical appliances. We vastly improved the performance and increased the range of our objectives by the immersion system. Amici seems first to have noted the beneficial effect of water immersion, but the system, I believe, was first carried into practical effect by Nachet or Hartuack. Mr. Wenham seems to have suggested, but not used the homogeneous immersion system, and the great optician Abbe, of Jena, worked out the matter, and brought Wenham's idea to full fruition. Oil of cedar, in virture of its refractive index and its dispersion coinciding nearly with those of crown glass, is the oil generally used for homogeneous immersion. But it must be borne in mind that, in order to get the full effect of this system, the objects themselves must be mounted in a medium of high refraction index, and this process is very apt to lead to error in observation. Mr. Nelson rarely photographs diatoms at any angle beyond the air angle, in order, as I undertand, to avoid these errors of interpretation due to mounting objects in these media of high refraction indices. Unstained physiological tissues are often destroyed for observation by being placed in glycerine, and a piece of glass placed in a bottle of water is not in advautageous circumstances for examination.

I have now to touch on the latest, and one of the great advances made, and this one affects in a very special manner our science of photo-micrography. On account of the nature of the glass used previously to but a few years ago, opticians found it impossible to correct objectives for more than two regions of the spectruu; lenses were corrected for the blue and yellow regions, or perhaps more commonly for the green and red, and when using such lenses under conditions at all trying we find fringes of colouring bordering our objects; in other words, we have a marked uncorrected residual spectrum. But Abbe and the firm of Schott, working together, at last succeeded in making glass with different refracting and different dispersing powers from the powers of glass previously made, and as a result Abbe has formulated and Zeiss has made objectives far superior in correction to any we have ever had before. The photographic results are distinctly superior to those obtainable by use of more ancient objectives, and there is, moreover, a marked improvement in the images even for visual observation. Three spectrum regions at least are made practically coincident

in foci, and the colour fringes are, if not wholly eliminated, at least greatly reduced. Some English opticians have produced with the new glass—which, as has lately transpired, contains fluor spar—very good "apochromatic" glasses, apochromatic being the term used to describe this new phase of optical achievement. It is claimed that by use of this new glass greater numerical aperture can be obtained in conjunction with equally good or better general qualities, such as flatness of field, illumination, &c.

So far, I have mentioned *special* advances that have been made; I may now say *broadly* that the optical improvements consist of the attainment of larger angle without loss of general quality. I think I may say that the history of microscopic optics has been the history of numerical aperture. There always was, and there ever will be, a limit to the aperture possible with a given focal length, but now more than ever we are getting long focal length and large aperture conjointly. In microscopic optics the word penetration must creep in sooner or later. Penetration or "depth of focus" is the suppositious power of focussing on two planes at right angles to the optic axis simultaneously, sufficiently accurately to prevent visible blur. It is manifestly impossible to focus on two such planes equally sharply, and the question is simply, "How much blur is permissible?" In artistic photographs it is a matter of taste; in scientific micrography it is a matter of mathematics. Penetration decreases directly as aperture increases, but decreases as the *square* of magnification. It is, therefore, beyond argument that the more the aperture—and, consequently, the more the resolution—we can get with the least magnification, the greater will be the penetration we shall obtain; and, therefore, what we have to search for is an objective of low power, with as wide a working aperture as can be achieved without damage to the corrections and general qualities of the objective. With a given focal length opticians reach a point of aperture beyond which they cannot go without injury to the quality of the objective. That is where we shall always stand; but our standpoint will from year to year be pushed onward, and our optical appliances will from year to year improve.

Speaking for myself, I am well satisfied with the optical contrivances we have to-day, but I look with eagerness for some advance in photographic power; particularly I long for greater power to cope with certain colour effects and colour combinations frequently met in my experience. I have no spark of doubt that in the process of time every candid investigator of microscopic objects who wishes a graphic representation of his objects of study will employ photography as his delineator; and I maintain that the scientific investigator of scientific facts is bound to use for delineation the only scientific method of delineation—photographic.

Appendix *(Objects shown in Illustration).*

(1.) Books.—"Bacteria," by G. M. Sternberg, second edition, 1885; "Photography of Bacteria," by E. M. Crookshank, 1887; "Mikro-photographischer Atlas der Bacterien Kunde," by Fraenckel and Pfeiffer, Nos. 1 and 2, 1889; "La Chambre Noire et Le Microscope," by Jules Girard, 1869.

Prints, &c.—Collection by Dr. R. L. Maddox from 1868 and onward—diatoms, insects, silica films, &c.; Diatoms by Thomas Comber; Diatoms, &c., by Dr. Clifford Mercer, Syracuse, U.S.A.; various objects by Mr. Rafter, U.S.A.; Scrapbook of Bacteria, by A. Pringle, 1878 and onward.

Lantern Slides.

Probiscis of blow-fly (lowest power to n.a. 0·90), four slides.

P. Angulatum ,, Silica film	(×3000)		Maddox, 1868 or 69.
Navicula aspera	(×1000)		Comber.
P. Angulatum	(×1000)		
Cymbella	(×1000)		
Isthmia nervosa	(×1000)		
Coscinodiscus osseus	(×1000)		

Triceratium (×80), (×375), and (×750) A. Pringle.

P. Angulatum	(×670)	n.a. 0·7	¼" 0·9	E. M. Nelson.
,,	(×1200)	n.a. 0·5	,, ,,	
,,	(×630)	n.a. 0·65	⅓" ,,	
,,	(×1080)	n.a. 1·0	⅛" ,,	
N. Lyra	(×230)	black ground	1" ,,	
C. Asteromphaieus	(×2000)	n.a.	⅛"	
A. Lindheimerii		n.a. 1·38	$\frac{1}{10}$ Spencer	Van Heurck.
P. Augulatum	(×600)	n.a. 1·4	$\frac{1}{12}$ Apo	
A. Pellucida		n.a. 1·6		
P. Angulatum		n.a. 1·6		
,,		n.a. 1·6		
S. Gemma		n.a. 1·6		
A. Lindheimerii		n.a. 1·6		
A. Pellucida		n.a. 1·6		
A. Pellucida	(×750)	n.a. 1·4	$\frac{1}{8}$ Apo	Pringle
P. Angulatum	(×2000)	n.a. 1·	$\frac{1}{12}$,,	

Collection of bacteria, including actinomyces, cholera, typhoid, anthrax, &c.

Apparatus.

(1.) Designed for the Royal Veterinary College. Made by Swift.

(2.) Baker's apparatus.

WEIGHTS, MEASURES, AND FORMULÆ USED IN PHOTOGRAPHY.*

Report of a Committee consisting of W. Bedford, C. H. Bothamley (Secretary), A. Cowan, A. Haddon, A. Levy, A. Pringle, and G. Watmough Webster, *appointed to consider the Weights, Measures, and Formulæ used in Photography. Drawn up by* C. H. Bothamley.

General Considerations.

The question of Weights, Measures, and Formulæ divides itself into two parts—the system of weights and measures to be used, and the method of using them.

A. *Weights and Measures.*—Choice lies between the English system, or a modification thereof, and the metric or French system.

The metric system is now almost exclusively used for scientific purposes. Its advantages lie not so much in the magnitudes of the units, but in the facts that there is a simple definite relation between the measures of weight and the measures of capacity, and that it is a decimal system, the multiples and submultiples being powers of ten.

It is necessary to point out, however, that the relation between measure and weight is only theoretically exact at 4° C. (39·2° Fahr.), at which point the unit of weight, *the gramme*, is the weight of *one cubic centimetre* of pure water weighed in the latitude of Paris. At the ordinary temperature of 15° C., however, the deviation resulting from the expansion of the water amounts to only 8 in 10,000, and is negligable for all practical purposes. Only in investigations of a very refined character need the divergence be taken into consideration.

With respect to the English system it is necessary, in the first place, to point out that the old "Apothecaries' Weight," with its ounce of 480 grains, and its submultiples, the drachm and the scruple, is no longer legal in the buying and selling of chemicals, and it has not been included in the "British Pharmacopœia" since 1864.

The legal units of weight in which dealings in chemicals, and all materials except gems and precious metals, are transacted, are the *pound avoirdupois*, the *ounce avoirdupois*, and the *grain*. The pound contains 16 ounces, or 7,000 grains, and the ounce contains 437·5 grains. The relation between the grain and the ounce is inconvenient.

The English units can be used, and are frequently used decimally. Quantities are expressed in grains and decimal parts of a grain, and there is no greater difficulty in writing 205·0 grains than in writing 12·96 grammes. Grain weights from 10,000 grains to 0·01 grain can easily be purchased.

* Read at the Photographic Convention at Chester.

The relation between weight and fluid measure is of precisely the same kind as in the metric system. The gallon is the bulk of ten pounds of water at 62° Fahr. ; a fluid ounce is the bulk of an ounce of water at 62° Fahr. ; 16 fluid ounces, or 7,000 fluid grains, is the bulk of 16 ounces, or 7,000 fluid grains, or one pound of water at 62° Fahr. Since the relation is quite exact at 62° Fahr., it is more exact at the ordinary temperature than in the case of the metric system.

Below the ounce, however, such a relation does not exist. The submultiple, the *minim*, has no simple relation to the grain, and this arises from the fact that when the fluid ounce was changed from the bulk of the troy ounce, or 480 grains, to the bulk of the avoirdupoise ounce, or 437·5 grains, the old mode of subdivision was retained, and we now have the fluid ounce of 437·5 grains divided into 480 equal parts or minims. A minim is therefore the bulk of only 0·911 grain of water, and to take the minim and the grain as equivalent introduces an error of about 10 per cent.

Fluid grains are, however, in use for chemical purposes, and the relation between the grain and the fluid grain at 62° Fahr. is precisely the same as that between the gramme and the cubic centimetre at 4° C. Measures graduated in fluid grains can be obtained without difficulty, and have been used by many photographers for a considerable time.

Whilst fully recognising the advantages of the metric system, we are also bound to recognise the facts that the English system is much more familiar, that the weights and measures of this system are possessed and used by almost all photographers, and that a knowledge of decimals sufficient to enable a decimal system to be used easily and accurately is by no means so widely diffused as is desirable. It follows that the general adoption of the metric system will at any rate require a considerable time, and in dealing with formulæ we recommend a method which is independent of the system of weights and measures used, provided always that the relation of the unit of weight to the unit of measure is the same as that existing between the gramme and the cubic centimetre, or the ounce and the fluid ounce.

RECOMMENDATIONS.

A. *Weights and Measures.*—1. If the metric system be used, weights will naturally be expressed in grammes and measures in cubic centimetres.

2. If the English units be used, the minim and the drachm should not be employed at all. All weights should be expressed either in grains or decimal parts of a grain, or in ounces and fractions of an ounce ; all measures in fluid grains, or in fluid ounces and fractions of a fluid ounce.

B. *Formulæ.*—3. Formulæ should give the number of *parts* of the constituents, by weight or measure, to be contained in some definite number of *parts, by measure*, of the solution. The mixture can then be made up with (*a*) grammes and cubic centimetres, or (*b*) grains and fluid grains, or (*c*) ounces and fluid ounces, according to the unit selected.

4. The standard temperature for making up solutions should be 15° C. or 62° Fahr. No appreciable error will be introduced by the fact that these two temperatures are not quite identical.

5. Formulæ should give the quantities of the constituents to be contained in x parts of the finished solution, and not the quantities to be dissolved in x parts of the solvents. When a solid dissolves in a liquid, or when two liquids are mixed, the volume of the solution or mixture is, as a rule, not equal to the sum of the volumes of its constituents. The expansion or contraction varies with the nature of the solids and liquids, and the proportions in which they are brought together. In making up a solution, therefore, the constituents should first be dissolved in a quantity of the solvent smaller than the required volume of the finished mixture, and after solution is complete, the liquid, cooled if necessary to the ordinary temperature, is made up to the specified volume by addition of a further quantity of the solvent.

6. It is very important to specify in the case of liquids whether parts by weight or parts by measure are intended. The equivalence between weight and measure only holds good in the case of water and liquids of the same specific gravity—a fluid ounce of ammonia solution or of ether weighs less than an ounce ; a fluid ounce of strong sulphuric acid weighs nearly two ounces.

7. Whenever possible, formulæ should give the quantities of the constituents required to make up 10, 100, or 1,000 parts of the solution.

8. When a mixture (*e.g.*, a developer) is to be prepared just before use from two or more separate solutions, it is desirable that the proportions in which the separate solutions have to be mixed should be as simple as possible, *e.g.*, 1 to 1, 1 to 2, 1 to 3, 1 to 10.

9. When metric units are employed the original French spelling, "gramme," should be used in preference to the contracted spelling, "gram," in order to avoid misreading and misprinting as "grain."

APPENDIX.

Weighing and Measuring.

A brief description of the correct methods of weighing and measuring may be of service to photographers who have had no laboratory training.

Measuring.—The correct reading is the horizontal tangent to the meniscus ; that is, the horizontal line which touches the lowest point of the curved surface of the liquid in the case of water and all liquids which wet glass, or the highest point of the curved surface in the case of mercury and similar liquids. When the liquid is so opaque that the meniscus cannot be seen, the reading must be taken at the apparent horizontal surface of the liquid. The measuring vessel should be exactly vertical, and the eye of the observer should be exactly on a level with the surface of the liquid.

Weighing.—To assume that the weights in the two pans are equal when there is a distinct deflection of the index of the balance towards one side is obviously incorrect. To take the weights as equal when the beam is at rest, and there is no deflection at all, also gives untrustworthy results. The balance should be made to vibrate, and the weights in the two pans are equal when the index makes *equal excursions on either side of the position of rest*, which is usually the centre.

NEW PHOTOGRAPHIC LENSES.*

BY DR. PAUL RUDOLPH.

No. II.

IN an objective consisting of two distinct systems, the contrarious elements required for compensation of astigmatic deviations are obtained without prejudice to full liberty as regards achromatisation of each single system, by compounding one of the systems—presuming both to be positive systems—of a normal, the other of an abnormal pair of glasses (the terms "normal" and "abnormal" being taken in the sense of the definition as given above).

The elements of actual construction of objectives, as specified in Tables I, II, and III, furnish examples for the practical application of this invention under varying conditions.

The opposite character of the pairs of glasses in the two separate members of a doublet are, however, conditional to the desired effect only in case both these members are required to be positive (collecting) systems, and if both are also required to assist in a notable degree in the concentration of the rays of light, or, in other words, in the diminution of the focal length of the objective. For many purposes it may, however, be sufficient or even advantageous to assign the function of the concentration of the rays of light wholly or principally to one system (principal system), viz., in such a manner that the other need not produce any notable refractory effects in the sense of a diminution of the focal distance, it having simply

* Continued from page 476.

and essentially to act as a correcting system, which admits of a relatively large positive or even negative focal length. According, as in this particular case, the principal system consists of a normal or of an abnormal pair of glasses, the positive or the negative element of the correcting system must be made to have the higher refractive index; the nature of the pair of glasses of which the correcting system is composed—*i.e.*, whether it is of a normal or of an abnormal character—is, however, non-essential, provided its focal lengths be taken very great. If, however, a negative focal length which is not very great as compared with the focal length of the principal system be given to the correction system, the latter, in order to insure the conditions of achromatisation, must be composed of a pair of glasses of the same character as the principal system; *i.e.*, either both of pairs of glasses of the normal, or both of pairs of glasses of the abnormal character.

The elements of construction, as specified under IV, serve to illustrate an anastigmatic combination of lenses of this last kind, in which one of its members constitutes such a correcting system of a negative focal length, both members consisting of normal pairs of glasses.

The new type of photographic doubtlets thus set forth admits, as is shown by the preceding explanations and the examples appended to this specification, of many modifications of detail, which modifications do not, however, introduce any novel features. The focal lengths of both parts of the double objective may have any ratio whatever; the system consisting of an abnormal pair of glasses and likewise the correcting system—assuming this latter case to enter into consideration—may constitute either the anterior or posterior member of the combination; finally, a great variety of glasses may be employed for carrying out the constructive principles as stated above, provided they leave sufficient scope for the selection of such pairs as are prescribed in each particular case by the foregoing directions.

All these special alternatives of practical construction are intrinsically dependent upon the particular purpose which such an objective has to serve, and the corresponding conditions regarding the aperture, the size of the field, and the degree of perfection required with respect to correction. Whenever these particular conditions on the one hand, and the optical constants (refractive index and dispersive power) of the available kinds of glasses, on the other hand, are given numerically, any optician versed in the treatment of problems of this kind is enabled, guided by the preceding remarks and the examples appended at the end of this specification, to numerically determine, according to known methods, those elements of construction (radii, thicknesses of lenses, air distances) which will sufficiently compensate astigmatic deviation, beside furnishing all the other usual corrections. In particular, no novel constructive feature is introduced by making one (*vide* Table III) or both of the cemented systems of the doublet to consist of three instead of two lenses, which may be particularly advantageous in such cases where the objective is to have a large aperture. For inasmuch as the use of three single lenses has no other aim in view but to distribute the effect otherwise attained by a single lens, over two, made of the same or similar kinds of glass, the substitution of a triple for a double lens belongs to those expedients which are ordinarily made use of by practical and theoretical opticians in order to attain an increased number of elements affording means for optical correction.

In the annexed drawings, three different arrangements of objectives, carried out according to my invention, are shown in full size, partly in elevation and partly in section. According to fig. 1 the anterior system of lenses is com-

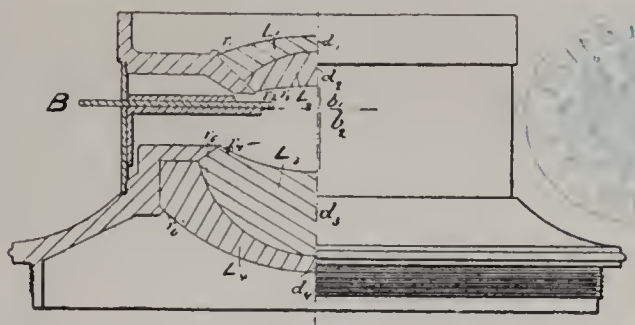


Fig. 1.

posed of the dispersing lens L_1 and the collecting lens L_2, while the posterior system consists in the collecting lens L_3 and the dispersing lens L_4, all these lenses being concavo-convex. B is the diaphragm. In the objective represented by fig. 2, the anterior system L_1 L_2 is com-

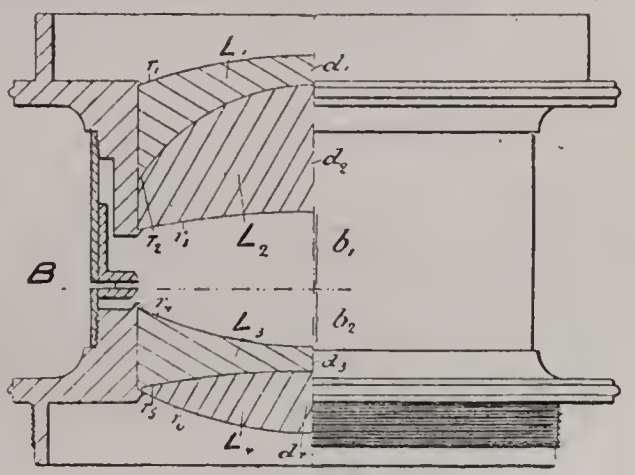


Fig. 2.

posed alike to the preceding one, whereas the posterior system consists in the biconcave dispersing lens L_3 and the biconvex collecting lens L_4. Fig. 3 again shows a

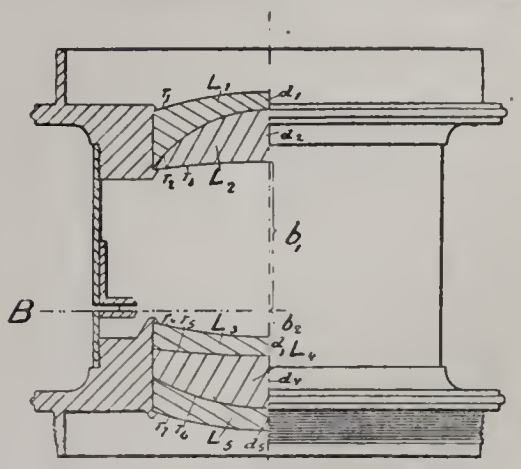


Fig. 3.

like system L_1 L_2, while the posterior system comprises two concavo-convex dispersing lenses, L_3 and L_5, and the concavo-convex collecting lens L_4. The letters r_1 r_2 r_3 r_4 r_5 r_6 r_7, to be referred to hereafter, denote the radii of curvature of the lens surfaces to which they are applied, d_1 d_2 d_3 d_4 d_5 the central thicknesses of the lenses, and b_1 b_2 the distances between the diaphragm B and the lenses.

Patent Intelligence.

Specifications Published.

11,994. *July 29th*, 1889.—"Polishing Engraved Glass or Plate or Sheet Glass." JABEZ FACER, Glass Etcher, Collis Street, Dennis Park, Stourbridge.

The invention relates to cut and engraved flint and coloured glass or sheet or plate glass, and has for its chief object the polishing of glass without the use of pumice or rotten stone and putty powder. For this purpose I provide a bath composed of hydrofluoric acid and sulphuric acid in equal proportions, with a sufficient quantity of water added to reduce it to a convenient strength for working purposes. In cases where metallic or other ingredients are introduced into the glass for colouring purposes, the addition of a small quantity of nitric acid or muriatic acid is beneficial.

The mode of operation is, then, to wash the glass with the acid until the desired brilliancy is attained.

I make no claim to the ordinary use of hydrofluoric or other acids for any of the branches of decorative etching as at present practised.

What I claim is:—

The use of the above-mentioned acid bath for the purpose of polishing cut and engraved flint and coloured glass or plate or sheet glass, and thus accomplishing by a chemical process what has been hitherto performed by mechanical appliances combined with the use of most injurious powders and manual labour.

12,648. *August 10th*, 1889. "Obtaining Alloys of Aluminium." JOHN CLARK, 80, Great Brook Street, Birmingham, Metallurgist.

The object of the invention is to operate upon any silicate of alumina with certain reagents in such a manner that when the said prepared silicate of alumina is mixed with the metal or metals intended to be alloyed with aluminium, and is melted therewith, the intended alloy of aluminium with such metal or metals is produced; or, if the prepared silicate of alumina is brought into contact in any convenient manner with such metal or metals while in a melted or plastic condition, the intended alloy with aluminium is thereby produced in a similar manner.

Correspondence.

PERSPECTIVE IN PHOTOGRAPHY.

SIR,—May I take the liberty of expressing a fear lest a passage in the presidential address, which we have all heard or read with such interest, may be so misunderstood as to discourage a study of much importance, namely, that of the relations between visual and photographic perspective. Commenting on Mr. Hamerton's case against photography in his well-known essay, that "It is false in perspective, and consequently in proportions and forms," the President said that "falsity of perspective and the proportion of forms is entirely a question of the proper or improper use of lenses, and need not exist at all."

I venture to submit that though this reply appears practically complete as regards the apparent distortion of portraits taken too close to the sitter—which Mr Hammerton had instanced as a special fault inherent to photography—yet, as a general statement, it is incorrect, and, I fear, misleading. For the real difficulty of the question, "how it is we can look on a friend's face or figure without feeling the distortion which would be unpleasantly obvious in a photograph taken from a position equally close," is not touched at all, but remains a problem which should be solved with scientific completeness, and not merely salved with a remedy, practically efficient, perhaps, in many cases, but yet applied empirically, and not indeed always applicable.

We cannot help recognising that some differences must really exist; for our graphic delineation is on a plane surface, corresponding neither to nature itself, nor to our vision of it. But still more important is it to recognise that such a sense of perspective as belongs to even the most cultivated visual perception—or, to the painting which may embody that perception—will never exactly correspond to the strict geometrical perspective of a good lens, however well selected and placed. For what we see in nature is affected to us by subjective modifications not similarly present when we look on its pictorial representation — photographed or painted—and photography cannot depict what is only subjectively present. In viewing natural scenes, we naturally apprehend actual rather than apparent magnitudes and forms; our perceptions being dominated by past experience and acquired knowledge. For as these strictly apparent proportions and forms change from moment to moment as we move, they are gone before we have fairly laid hold of them. And in the mass of such changing and varying perceptions, which we suppose to constitute the image of nature as we survey it, the constancy of our memory or conception of *actual* forms and magnitudes, which are always the same, preponderate to a greater or less extent, according to our cultivation, and according to the familiarity or strangeness of our surroundings. It is thus that a just sense of perspective is a comparatively late product of observation and mental development, and that different parts are apprehended in differing proportions — often contrasting strongly with the utter rigidity and geometric accuracy of the apparent image formed by a lens. It is thus, too, that "falsity of perspective" means one thing to artistic feeling, and another to geometrical accuracy. We cannot have a real science of photographic perspective unless we fully recognise all the facts—psychical as well as physical—and such a science is greatly needed, rightly to direct our efforts.

I am persuaded, from other passages in the presidential address, and from what Mr. Hamerton has written in other essays, that these remarks are not really discordant with the views of either authority; and with such a feeling I have ventured to write this letter. W. H. WHEELER.

HACKNEY PHOTOGRAPHIC SOCIETY.

SIR,—Below is our programme for July and August, 1890:—

July 10th—Demonstration, "Exposure and Development," Mr. Birt Acres; July 19th—Excurson to St. Albans (trains leave King's Cross, G.N.R., 2.40; July 24th—Discussion on excursion work; August 14th—Demonstration, "Intensifying, Reduction, and Varnishing." Mr. R. Beckett; August 16th—Excursion to Carshalton (train from London Bridge at 2.18); August 28th—"Portraiture and Retouching," Mr. J. Hubert.

Prizes will be given for the two best photographs taken on Society excursions. Other prizes for work done during the present year will be given, of which due notice will be sent to each member. In each case an entrance fee of 1s. will be charged. Members not having paid their subscription for present year are requested to send on at once to the treasurer.

W. FENTON JONES, *Hon. Sec.*

12, *King Edward Road, Hackney, N.E.*

THE LATE MR. BAYNHAM JONES.

SIR,—I regret to say that the oldest photographer in this country died on the 19th ult. at Cheltenham.

The late Mr. Baynham Jones was known to me for many years, and the last time I saw him was in London last year at the Jubilee Convention. A lawyer by profession, he was from first to last a most enthusiastic amateur photographer; but to convey to the minds of yourself and readers what kind of man the late Mr. B. Jones was, I think I cannot do better than make an extract from the "Evolution of Photography":—

"Looking round the hall on the opening night, and scanning the features of those present, I was coming to the conclusion that I was the oldest photographer there, when I espied Mr. Baynham Jones, a man of eighty-three winters, and certainly the oldest amateur photographer living; so I willingly ceded the honour of seniority to him, and, as soon as he espied me, he clambered over the rails to come and sit at my side and talk over the past—and quite unknown to many present—aspects and difficulties of photography. Mr. Baynham Jones was an enthusiastic photographer from the first, for in 1839, as soon as Daguerre's process was published,

he made himself a camera out of a cigar box and the lens of his opera glass, and being unable to obtain a Daguerreotype plate in the country, he cut up a silver salver, and worked away on a solid silver plate until he succeeded in making a Daguerreotype picture. Mr. Baynham Jones was not the first photographer in this country, for the Rev. J. B. Reade preceded him by about two years; but I have not the slightest doubt of his being the first Daguerreotypist in England, and in that jubilee year of 1889 he was working with gelatine plates and films, and enthusiastic enough to come all the way from Cheltenham to Loudon to attend the meetings of the Jubilee Convention of photography."

He was a genial and kindly old man, and one of the old school which is rapidly becoming extinct.

11A, *Berners Street, July 1st*, 1890. JOHN WERGE.

Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting on the 26th inst. Mr. J. T. Atkins occupied the chair.

The Chairman drew attention to a new French developer, "La Daguerrienne." Several plates could be developed in the same solution, and the results were stated to be very good.

Mr. J. S. Teape had recently experienced cases of frilling when plates were put in the alum bath, which, however, disappeared when the plates were fixed.

Mr. Pask asked whether perchloric acid, added to the silver solution, 10 drops to the ounce, would preserve sensitised albumenised paper.

Mr. W. E. Debenham said perchloric acid was a preservative in itself, but it would not protect the paper from the effects of a bad atmosphere.

Mr. Teape asked if any members had seen phosphorescence in the dark room on a plate insufficiently washed when placed in the alum bath.

Several members had noticed this, but no one could give any explanation as to the cause.

Hackney Photographic Society.

At the meeting held on Thursday last, Mr. W. L. Barker presided.

Mr. Dean showed a negative having traces of fog very apparent, but explained that he poured a solution of caustic over it in developer.

The Secretary said that that would explain the fogginess.

Mr. Grant showed some prints taken from negatives by a guinea hand-camera of Griffith's, but had found the dark slides, in two cases out of three, had let in the light.

A fine platinotype print by Mr. Wesson was shown.

The Secretary handed round some Wormald's masks.

From the question-box: "How can staining by hydroquinone developer on bromide paper be avoided?" Several members had complained of this.

The Secretary said that he had found by using a few drops of ten per cent. solution of brom. potassium he overcame it.

Mr. A. Barker had seen cyanide of potassium recommended.

Mr. Crouch then gave his paper on "Lenses." He described the various forms now in use, and spoke very favourably of single lenses, which many people objected to on account of distortion. He, however, had not found so much lately as used to be the case. The lecturer said lenses were made too rapid, and that *f*/11 was rapid enough for anything. He advocated use of lenses as follows:—For quarter-plate, 3, 6, or 8, and a 9-inch focus; half-plate, 4, 8, and 12; 7½ by 5 and whole-plate, 5 or 6, 12 and a 15, or 18 inch. He objected to portrait lenses.

Mr. W. L. Barker wanted to know why the lens tube of a wide angle was so narrow.

Mr. Crouch said that it made it more portable.

In answer to the Secretary, Mr. Crouch said that the iris diaphragm gave no extra protection from flare spot. He liked diaphragms in this form, as there was no danger of losing them, and you could the more easily use them. Rust on glass was caused by an oxide formed on the surface, and was due to the presence of lead. It should be polished out.

The Chairman then called on Mr. J. O. Grant for his paper on "Selection of Apparatus."

Mr. Grant advised the beginner to get a half-plate camera to start with, as amateurs always got dissatisfied with a quarter-plate, on account of its being too small. He, however, recommended a cyclist to get a hand-camera such as Shew's. He disliked the idea of rushing off and buying a second-hand camera, as many were not quite safe to use, not being light-tight. He preferred the back to rack out instead of the front, as there was no danger then of cutting off.

In answer to various questions, Mr. Grant said that with Kinnear bellows the folds must sometimes be gathered up so as not to cut off the view. He thought that between the lenses was the best place for the shutter.

The Secretary asked what was the advantage of having both a swing front as well as swing back?

Mr. Crouch pointed out that in using wide angle lenses it was often really necessary, through there not being room to use the back alone.

Mr. Capell was troubled with jarring with his Newman shutter.

Mr. Crouch said that Dr. Roland Smith avoided this by leaving his band of shutter loose.

The Bath Photographic Society.

On Saturday, June 28th, the members visited Lacock Abbey. The party, numbering seventeen, was conveyed by brake *vid* Box and Corsham. The drive of thirteen miles is very picturesque, but the incessant fall of rain prevented work *en route*. Upon arrival at the Abbey, Mr. C. H. Talbot conducted the party over his premises, describing minutely the structural changes effected by himself and ancestors, as well as pointing out that which through many generations had remained intact. The Abbey, we gleaned, was purchased from Henry VIII. by Sir William Sherrington, who converted it into a Manor House. The work of change was further carried out by Mr. Jno. Ivory Talbot and Mr. Wm. Henry Fox Talbot. Although Mr. Talbot says the style of architecture has not been so well preserved as it might have been, the place abounds in treasures in art, science, and literature. Excellent paintings by known artists, many of remote date, remarkable specimens of antique, and numberless objects of scientific interest are there; but what was of especial interest to photographers are those unique and early specimens of the photographic art which made the name of Fox Talbot so famous. These date from 1834 onwards. Fox Talbot was known to his friends as a very rapid experimenter, able to follow an idea and results in quick succession over a wide field of research; hence so much ground covered. Mr. Talbot showed the company several albums of photographs produced by his father by means which he discovered anterior to his publication of the Photogenic and Calotype processes in 1839 and 1841 respectively. The etched copper plates prepared for Fox Talbot's photoglyptics and a number of specimens of the process were shown. Notwithstanding the incessant rain, cameras were fixed and several views of the buildings taken. Upon leaving, the members were cordially invited by Mr. Talbot to return on a more photographically favourable day next season, which they promised to do. Tea was served at the Red Lion, at which votes of thanks were passed to Mr. Talbot, and to Mr. Austin J. King for his generous present to the Society, namely, provisioning the brake *en route*. An invitation to visit Prior Park from Canon Williams was read by the secretary, and unanimously accepted for July 26th. Swift's new hand-camera, "The Memorandum," Powell's developoids, and other novelties were drawn attention to on the road. It was also decided to discontinue the indoor meetings at the Institution until next September, but regular outings will be supplemented.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

June 17th.—Mr. H. G. RIDGWAY in the chair.

The HON. SECRETARIES reported upon the recent exhibition, which has resulted in a small balance on the right side of the ledger.

New members, to the number of twenty-two, were then elected, and arrangements as to outdoor meetings concluded.

The subject for the evening was an exhibition of and discussion upon "Hand-Cameras," examples of which were submitted by the local dealers and by various members.

Mr. J. HEDLEY ROBINSON, in opening the discussion, exhibited an ingeniously simple and compact instrument, constructed by himself, which was small enough to be carried in the pocket, but at the same time a business-like little affair, taking lantern-size plates. Slides were exhibited by Mr. Robinson, which amply showed its capacity in his hands. Commenting upon the cameras on view, he was inclined to fear that, unless very carefully manipulated, there was danger of shaking the camera when releasing the shutter; and he advocated the principle of holding the camera firmly in both hands, taking a sight along the top at the subject, and firing the shutter off by squeezing the bulb in the mouth, which, if not elegant, is at least practical. The subject of lenses next came under consideration, and he spoke highly of the single form, concluding with a sensible piece of advice—not to use stale plates for work of this kind.

Other members then commented upon the cameras of their choice, and the meeting broke up.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A MEETING was held at St. Edmund's College, June 16th, Mr. B. KARLEESE in the chair.

Mr. G. A. THOMASON gave an epitome of the excursion to Coventry, and gave notice of the whole day's excursion to Wilmcote and Stretford on July 19th.

Seven new members were elected.

Mr. W. J. HARRISON, F.G.S., then gave his paper on "Orthochromatic Photography," which was illustrated with a large number of negatives and prints and lantern slides taken by the lecturer, showing the advantages of orthochromatic plates over the ordinary; also prints of negatives taken from oil paintings with screens of different intensity. He said that ordinary plates could be made to give the proper gradation of shade by soaking them for two minutes in

Erythrosine	1 part
Water	7,000 parts

and then drying in dark room, and that although great strides had lately been made in orthochromatic photography, yet no satisfactory way had been found for photographing reds. In the developing room it is as well to cover the red glass with brown tissue paper.

The CHAIRMAN said that he found exquisite detail in the shadows of negatives taken on orthochromatic plates.

Mr. MIDDLETON said that Dr. E. Albert develops in a *blue* light; but his process of preparing the plates is a secret, and he uses no screen. Father Perry used the same in his astronomical studies.

Mr. TUCKER had photographed the spectrum of steel at a white heat, by placing it between two carbons connected with the dynamo, with great success. The plates were first soaked in eosine.

Mr. HARRISON exhibited a number of prints and negatives, showing good work, on the Vogel-Obernetter orthochromatic plates; these were the work of Mr. Gotz, the English agent for these plates. Also some capital landscapes and flower subjects, lent by Mr. B. J. Edwards, and taken on his isochromatic plates.

RECEIVED.—From Messrs Iliffe and Son, "The International Annual of Anthony's Photographic Bulletin," 1890-91. It is full of information, contributed by authors of acknowledged ability, and the illustrations, which are examples of the application of photography to illustrative purposes, are numerous. The price of this midsummer annual is two shillings.

Answers to Correspondents.

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

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

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

S. B. (Aldershot).—*Finely Ground Glass.* For the final grinding of glass intended for focussing screens, use the quality known as flour emery, moistened with water, and rubbed between two glass surfaces with slight circular motion. This will furnish two screens at one operation. Another plan is to grind the glasses singly upon a zinc plate with flour emery and water. Mr. F. H. Varley's instructive chapters were those of recent date, to which you doubtless refer.

P. L.—*Changing Plates.* By consulting their convenience as to time, many local photographers will give you facilities by loan of dark room for a few minutes; and a list of hotels providing this accommodation is given in the "Cyclists' Manual and Road Book." Several amateurs manage to do it in absolute darkness by the touch, but this requires some practice and forethought. The simplest lamp is a three-fold framework of stiff cardboard filled in with cherry or ruby fabric, with a triangular flanged plate of iron to drop over the top, and a night light, or cup of hard paraffin with a wick, placed within.

J. B. (Maldon).—*Liesegang's New Fixing Agent.* We have not yet tried it, but chloride of magnesium solution is stated to have great power of dissolving the haloid salts of silver, so much so that with two baths applied successively the whole of the unaltered silver may be removed. We know that Fox Talbot originally employed a strong brine of common salt for this purpose. An experiment well worth trial might be the attempt to use a concentrated sea-water for fixing, which would contain both these salts in solution. Be sure and use enough liquor to accomplish the desired end.

M. E. T.—*Cleaning the Margins of Mounted Photographs.* Whether framed or kept in portfolios, the broad mounts are sure to become dingy in course of time; the best mode of cleaning the card is to rub it with bread-crumb, and not india-rubber. Especially avoid the use of the white vulcanised rubber, now commonly employed as a pencil eraser, for the fine particles contain so much sulphur, and are certain to cause fading of the photograph.

A MEMBER.—*The Parent Society's Exhibition* will be held once more in Pall Mall. Three months' notice is surely time enough to get ready, and your works will be judged by a high-art jury of pre-eminent qualification.

L. A. D.—*Friese Greene's Opal Cards.* The specification has been published; No. 7,747, dated May 9th, 1889. The cards are coated with a mixture of zinc white, turpentine, and pale gold size, either with or without a preliminary treatment with sulphuric acid of specified strength to parchmentise the paper.

S. N.—*Old Earthenware Dishes.* Those which have been used long enough to develop cracks extending only through the glaze may be cured by warming cautiously in a slightly heated oven, and rubbing in melted paraffin. Actual fractures are more difficult of treatment, shellac cement or marine glue being the best ingredients for trial.

TYRO.—*Col. Waterhouse's New Developer.* It is scarcely correct to describe it as a preparation of gum guaiacum, although derived from it by destructive distillation. Guaiacol is an oily body of strongly aromatic odour, soluble in alcohol and alkalies. Being liquid the required dose is measured off, shaken up with the prescribed quantity of alkaline carbonate, and used immediately as a developer.

R. M.—*Photographers' Benevolent Association.* Subscriptions for the current year are now overdue, and should be paid to Mr. H. J. Beasley, 66, Chancery Lane, W.C.

E. C., A. G. K., and CASTILE answered by post.

Other Correspondents in our next.

Chromo Collotype. *Waterlow & Sons Ltd., London.*

DIONYSII AREOPAGITÆ OPERA QUÆ EXTANT.

FROM THE LIBRARY OF CATHERINE DE MÉDICIS.

Example from "Remarkable Bindings in the British Museum." By kind permission of the Publishers, Sampson Low, Marston, Searle & Rivington.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1662.—*July* 11, 1890.

CONTENTS.

CHROMO-COLLOGRAPHIC PRINTING.

ILLUSTRATED BY A PICTORIAL SUPPLEMENT.

TO-DAY we present our readers with a supplement in colours, executed entirely by photographic means by Messrs. Waterlow and Sons, who have furnished the following information as to its method of production. It is one of a series of coloured photographs of remarkable bindings of old books among those in the British Museum.

The process is simplicity itself, and being so simple and effective, it is somewhat surprising that it has not been generally introduced before. Similar results have been published before, but we believe only by means of chromo-lithography in combination with collotype printing; the present supplement has been produced by improvements upon that method devised by Mr. J. D. Geddes.

Perhaps the process may be most easily explained by beginning with the production of the red portion of the print. The book is laid horizontally on a table, and illuminated by diffused light. A reversing mirror is employed, and a very long exposure given with an orthochromatic plate, because, the reds not being pure, but containing a proportion of yellow, it is usually found that more detail is obtained than by the use of ordinary plates. With the long exposure, the other more actinic parts of the design are to a great extent obliterated, so that the plate requires little or no blocking out to make it ready for printing.

Upon another negative plate the blue portion of the design is obtained by an exceptionally short exposure and normal development. All the rest of this plate but that representing the blue image is then quickly blocked out, because skilled work is not necessary; it can be done in ten minutes by an inexperienced person of average intelligence.

The two extremes, red and blue, having been obtained in this way, representations of portions of the design in other colours are obtained on the same principle by modifying the exposures and the development and blocking out the parts of the negative not required. Four colours, of course, require four plates.

When a portion of the cover of the book is gilt, that part of the design is printed from the collotype plate upon paper in gold-size varnish, which is afterwards gilt in the usual way.

In the supplement are four printings, three in colours and one in gold. In the matter of gradations of tone, the results are as good as with many more printings in chromo-lithography, and more true to the original. To get the exact colours an artist had to be sent to the British Museum with a palette, where he matched on paper the tones presented by the cover of the book. This process represents, in a remarkable way, worn or torn portions of the cover; the collotype plate seems to lend itself to the pictorial reproduction of such details. The possible applications of the process to colour illustration are barely indicated by the supplement, and experimental research is now being made in the endeavour to apply the method to a variety of subjects, including negatives from nature and the reproduction of paintings.

The printings from the collotype plates are performed in the ordinary way, only special care is taken in the selection of the pigments which, in combination, will match exactly the colours of the original. Messrs. Waterlow & Sons have now no less than eight German and French steam collotype machines at work, and as they occasionally get orders from the Continent, it is interesting to know that at last a stand is being made against foreign competition, which has so long held sway in this particular branch of industry. We have inspected several well-known collotype printing establishments on the Continent not nearly so well equipped as the works in Finsbury, in which the present supplement was produced. The fact is, that the prices for ordinary collotype printing are so low that without a good supply of steam machinery, adequate division of labour, careful attention to details, and skilled workmen at every point, it is a class of work likely to bring in little remuneration.

PHOTOGRAPHY BY TELEGRAPH.

In this age of hurry every man of business is enabled, by modern appliances, to do in a few hours the work which our forefathers would have considered more than sufficient to occupy them for a week. The introduction of railways would seem to have inculcated the notion that everything must move at railroad speed, and it is impossible to foresee where this desire for rapid movement will stop. The first step towards quick communication was the semaphore system. This was replaced by the telegraph, and the telegraph in its turn has been largely supplanted by the telephone. Every city and town in the world is now covered by a complicated cobweb of wires, all converging to one central point, where the exchange is situated, an arrangement which permits anyone to communicate with any other member of the association. Within a short time, we are promised that the phonograph will be so perfected that it will record any sounds submitted to it, and, like an obedient clerk with a memory that never forgets, will at any time repeat the matter that has been consigned to its keeping.

Our telegraphic system has always been pointed to as one of the most remarkable triumphs of science, and one which has proved how reality will occasionally outstrip romance, and the improvements in telegraphic instruments which have been introduced within the past few years would have surprised even those who prophesied so much with regard to what developments might be brought about. News from every part of the habitable globe is constantly pouring in upon us, and by means of a wonderfully perfect organisation, and by the help of the press, we receive this news almost as soon as the events which it deals with have taken place.

A vague notion of how this is all brought about is all of which the general public can boast. They know that the payment of sixpence will entitle them to hold telegraphic converse of a limited nature with anybody in Great Britain who is within touch of a post-office, and this knowledge leads them to believe readily in any report which tells of coming and greater wonders.

A report of this kind has been raised from time to time by means of those paragraphs which occasionally appear in our newspapers, the origin of which it is difficult to discover. It has been the fashion for some time to link Mr. Edison's name with anything startling of an electrical nature. This is not surprising, for Mr. Edison has already accomplished such wonderful things that there is some excuse for regarding him as a magician. It does not, therefore, excite any great feeling of surprise when it is stated that he is engaged upon a scheme for telegraphing a picture of an event taking place at a distant point. The report is probably false, but it may be true, and so it is as well that we should consider how far such a rumour may be within the bounds of possibility.

There is more than one contrivance by which the actual handwriting of a person may be conveyed from one place to another by means of the electric current. The most noteworthy, perhaps, of these is Cowper's writing telegraph, which a few years ago was at work for some time experimentally between Woking and Waterloo Stations on the South Western Railway. In this system the pen at the transmitting station was in contact with certain apparatus which varied the resistance of the current as the pen was moved over a slip of paper which travelled by clockwork. These variations affected a similar pen charged with ink at the receiving station, and the handwriting—somewhat cramped, it is true, by the necessities of the case—was reproduced. Now it is obvious that if handwriting can be transmitted in this way, the transmission of a drawing executed in simple lines—that is to say, what is popularly known as a pen and ink sketch—cannot be impossible. And as a matter of fact drawings, of a kind, executed at a distant point were reproduced by telegraph many years before Mr. Cowper's writing telegraph was ever conceived.

In the year 1850 Bakewell, taking advantage of the observation made long before his time that the electric current would decompose certain salts, and so produce a coloured stain upon paper impregnated with those salts, perfected his telegraphic system. It was cumbrous in design and somewhat slow in action, but it was capable of reproducing a picture under certain conditions, the chief among them being that the design must be executed in resinous ink on tinfoil. It will be seen at once that such a necessity at once relegated the instrument, ingenious as it was, to the domain of experimental things, and the contrivance is now forgotten except by those who take an interest in looking up old text-books of electricity. Not many years ago the idea was revived and very much improved upon by M. d'Arlincourt in his autographic telegraph. Some results achieved by this instrument we saw at the time of its invention, and we may broadly say that the reproduction had the same relation to the original that a Meisenbach block has to the photograph to which it owes its origin—in that it was expressed in lines. This line reproduction was, indeed, a necessary outcome of following out Bakewell's method, which may be briefly described as follows. The drawing in resinous ink on tinfoil was placed on a revolving cylinder. A metallic point was caused to touch this cylinder, and to traverse every part of it as it revolved, so that if this point had been a cutting tool it would have cut a screw thread from end to end of the cylinder; but its object was merely to bring about electrical contact, and so complete a battery circuit. But whenever the point went over a resinous line the current was for a moment interrupted, to be reinstated once more when the tinfoil was touched.

These interruptions were recorded at the receiving end of the wire, where another cylinder revolved covered by chemically prepared paper, and traversed by a similar pointer. So long as pointer No. 1 touched the tinfoil, pointer No. 2 decomposed the salts in the prepared paper, and left a coloured line; but directly pointer No. 1 went over the non-conducting resinous

line, the electricity was cut off, and pointer No. 2 left no trace. The result was what we should call a negative—a picture composed of white lines on a dark background. It is possible that by some means photography could be made to simplify the arrangement, and it would certainly not be difficult to obtain a picture on tin-foil by its aid; but the game would be hardly worth the candle.

If it be true that Mr. Edison is experimenting in this direction, and has any dream of causing photographic action to take place through the medium of an electric current, he would probably turn his attention to selenium as the most promising agent for his purpose, for we know that this curious substance possesses the remarkable property of varying its resistance with the amount of light which is shed upon it. Professor Graham Bell has obtained some startling results from it in his photophone experiments, and it may possibly lead the way to the reproduction of a picture at a point distant from its place of origin. A dream of such possibilities has occurred to many, but that dream has not yet taken substantial shape.

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

At the Photographic Convention at Chester the following officers and members of Council were appointed for the coming year, and for the management of the Bath meeting in 1891 :—

President—William Bedford. *Hon. Secretary and Treasurer*—J. J. Briginshaw, 128, Southwark Street, London. *Auditors*—E. Clifton and T. Charteris White. *Council*—London members: A. Cowan, H. M. Hastings, A. Haddon, A. Pringle, Friese Greene, J. Traill Taylor, F. P. Cembrano, F. A. Bridge, G. Davison, C. Phipps Lucas, C. H. Benham, W. H. Walker, A. Levy, A. Mackie, J. B. B. Wellington, R. P. Drage. Provincial members: O. Berry, Wrexham; A. A. Carnell, Plymouth; J. Martin Harding, Shrewsbury; W. J. Harrison, Birmingham; R. Keene, Derby; W. Lang, jun., Glasgow; Paul Lange, Liverpool; Major J. Lysaght, Cork; E. Marlow, Birmingham; George Mason, Glasgow; T. S. Mayne, Liverpool; W. W. Naunton, Shrewsbury; J. B. Payne, Newcastle-on-Tyne; J. Porritt, Leicester; B. J. Sayce, Liverpool; A. Seaman, Chesterfield; J. M. B. Smith, York; John Stuart, Glasgow; H. Sturmey, Coventry.; A. Tate, Belfast; W. Taylor, Leicester; J. M. Turnbull, Edinburgh; G. Watmough Webster, Chester; and A. Werner, Dublin.

During the excursion to Hawarden Castle, on the day before the Convention left Chester, the weather was splendid for photography; massive cumulus clouds were floating about, and every now and then bursts of sunshine came down between the clouds. Mr. Gladstone was fortunately absent during the Convention visit; we say "fortunately," because a statesman has as much right to a term of private life as anyone else, and the Photographic Convention cannot be numbered among those bad-mannered intruders who almost force themselves upon his privacy.

During the Convention visit, a terrible tragedy took plac in frout of the City Hall at Chester. A father murdered his only son with a bludgeon, then raised the body on the end of the weapon, aud tossed it high in the air. The childless mother next appeared upon the scene, and he gave her a blow behind the head, the sound of which could be heard all over the square; she likewise sank at his feet a corpse. Officials of the Eastman Company, as well as some other photographers, were looking on, but, from excitement or other cause, forgot to use their kodaks. The murderer's countenance betrayed no symptoms of regret; on the contrary, he smiled unceasingly, and rubbed his back up and down against a post, uttering unhallowed squeaks of trinmph. For a moment only did he show signs of contrition, by bending over his wife's body, and squealing, "O Judy, dear Judy!" The sympathies of the observers were evidently on the side of the culprit. How is it that Punch always has as much mob sympathy on his side as does the villainous old wife-murderer, Henry VIII.? Punch and Judy shows are but survivals of Italian puppet miracle plays, and, in his native clime, Punch originally was Pontius Pilate.

THE PHOTOGRAPHIC CONVENTION AT BATH.

About midsummer next year the Photographic Convention will meet in Bath, and with the experience of the past the managers will be better able to deal with the difficulties of the future. Unless the excursion for any particular day is but to a moderate distance, or to a place of bnt average attractiveness, it is evidently a mistake to draw the members back while several hours of daylight remain, in order that they may be present at the reading of papers in the evening. Presumably the chief excursion from Bath will be to Chepstow Castle and the banks of the Wye as far as Tintern Abbey, which includes, perhaps, more beautiful scenery than is to be found anywhere else within similarly easy distance of London. Unfortunately, between Chepstow Castle and the Wyndcliff a private park includes the western bank of the Wye, and those who go to Tintern by road have to pass over two or three miles of ground away from the river, and totally destitute of pictorial interest. The lower reaches of the Wye have the highest tides of any river in England, and when the tide is low, ugly mud-banks rise at each side of the river, nearly as steep as the roof of a house. Near the railway station at Chepstow is a picturesque cutting by the river and through the rocks; the heights are thickly wooded. Chepstow is reached *via* the Severn Tunnel, or if a steamboat be engaged, it could go down the Avon, under Clifton Suspension Bridge, then cross the Severn and proceed up the Wye to Chepstow. Once this was the regular means of communication between Chepstow and Bristol, but whether the opening of the tunnel has affected the old steamboat service we do not know. Evidently an excursion of this kind should occupy the whole day, and not be cut short, as was the case at Conway, because papers have to be read in the evening. Another excursion—this one close to Bath—will, no doubt, be along the valley from Bathampton to Bradford-on-Avon, which is picturesque the whole way, and includes subjects of historical interest. The ballast

used in the construction of the railway between Bradford and Trowbridge is rich in fossils, and in a bed of blue clay in a railway cutting this side of Trowbridge are numerous crystals of selenite, a fact which may interest those who are in the habit of experimenting with polarised light. A third excursion will probably be to Clifton Downs and Bristol. Bath itself, with its abbey, its architectural antiquities, and its picturesque surroundings, offers plenty of subjects for the camera. Here Beckford, the author of Vathek, lived, and the tower built by this remarkable man of fantastic imagination awaits the arrival of the Convention to be photographed.

The Photographic Convention may now be said to be upon a fairly permanent basis; it meets a want of the photographic fraternity in providing a summer outing, at which, also, many meet who otherwise would not make the personal acquaintance of each other. The Convention, practically speaking, was founded by Mr. J. Traill Taylor and Mr. J. J. Briginshaw. The former gave it its somewhat American title, and the latter told the listeners at the Convention dinner in the Grosvenor Hotel, Chester, that the organisation has now reached a stage at which "it can no longer be damned with faint praise." Mr. A. Pringle has done much in the nursing of the infant Convention, and the Mayor of Chester has given a good lift to the Association, which is likely to grow into something large in the future.

A marked feature of the meeting of the Photographic Convention at Chester was the absence of the general public at the meetings at which papers on photography were read, although some of the less technical utterances at such meetings were of general interest; Mr. Gambier Bolton's paper and lantern illustrations, for instance, were of a popular character. The question whether residents in the particular locality in which the Convention meets should be allowed to become associates for the week on payment of the nominal fee of a shilling towards the funds of the Convention, may be worth consideration. Such associates might join the excursions on the same terms as ordinary members.

The Photographic Club.—The subject for discussion on July 16th will be "Iron Printing Processes;" July 23rd, "Ceramic Photography."

Suggestions of Sitters.—A firm of photographers engaged in the production of a group which, they say, is considered successful, send the following suggestions sent to them by individual members of the group:—"Mrs. ——'s eyes might look larger, and her mouth have a bit taken off the corner. The body of her dress has very ugly creases. Please have them taken out altogether." "Mrs. ——'s eyes might be improved and the eyebrow put straight; the strong shade near nose much softened; the corner of sleeve taken out altogether." "Mrs. ——. Lines on the face still more softened, particularly between the eyebrows; the outline of cheek near the little girl could be improved." "The little girl's eyes look too small (particularly one of them)." "The little boy's ears are, by nature, too large. Can you please make them a proper size by shading part of them out altogether against that background; I should think it would be easy." Our correspondent may well wonder what next professional photographers will be called upon to do.

PHOTOGRAPHIC EXHIBITIONS.

BY GEORGE DAVISON.

No. VI.—Judges.

In the higher form of exhibition, for which I have indicated a few necessary regulations, a jury in the ordinary sense would not be required. The hanging committee practically takes some of its functions; indeed, the qualifications of a competent hanging committee are, to a great extent, those required for a board of judges, although the functions of the hanging committee are much broader. Taking the system of competition as we find it, however, the question of the jury becomes the most important to be dealt with. If prizes are given at all, they should at least be given only for such pictures as are truly deserving of some recognition, and in the art section should be given only to such as possess artistic qualities. It is safe to say that, under the present development of the classification and competition system, in five out of six cases the successful photographs are in no way qualified for the distinction they receive. This arises partly from the system itself, but chiefly from the characteristics of photographic judges. Faults from partiality, faults from vindictiveness, must be common to any system, but defects from ignorance ought to be avoidable. In many classes in which adjudication is made, the award has been given for no other reason than that the exhibit shows what has been held to be correct exposure, the result agreeing with a certain convention or standard of brightness and sharpness set up by a purely scientific consideration of photography. Mrs. Cameron, in writing of an early exhibition in Scotland, where she had shown some of her remarkable portraits, complained that the test of the judges was as to which photograph showed most the detail and pattern of table cloth, &c., and such has been the attitude of most photographers acting in the capacity of jurors.

In the May 30th issue of the Photographic News, there appeared an article contending that painters were not suitable or qualified judges of photographs because, it was averred,—1st. The means used by them were different. 2nd. They would give awards for what most resembled paintings. 3rd. They did not know the difficulties of photography. Now this contention simply means that there is no such thing as good art in photography, and that it is purely a matter of scientific motions. The writer speaks of roughness as charming in a painting, but as not even tolerable in a photograph, and he conducts his argument generally as though smoothness and sharpness were the essential characteristics of photography. Treatment in focussing is to him no power in the hands of the artist, and he holds the photographer's technique cannot be made obedient to the eye and will. It is impossible in the limits of these articles to discuss fully a comparison of the photographer's and the painter's technique, but the question of qualifications for adjudicating between photographic pictures does not depend chiefly upon whether the means employed by the judge and the competitor be exactly the same, but upon whether the judge has been trained to understand what constitutes artistic qualities. The aim of the painter or etcher or engraver is exactly the same as that of the photographer. If the photographer had been through the same art training as the painter, then he would be the best judge possible; but it must be remembered it is no question of deciding whether a plate is fogged or underexposed or done with a pinhole, and so forth, but whether

a picture is a spirited, complete representation of a natural scene and subject. A long cultivation upon the top of natural aptitude is needed to decide what is true in a pictorial representation. It is in subtle rendering of passages, simple or complex, in nature that much of the enjoyment of the true connoisseur consists. Composition, which the jury has to understand and appreciate, is not merely a detail of arrangement. In good composition is comprised the selection of what will most completely express a certain subject, and give the salient features under the most characteristic conditions, and the whole has to be translated in a way that shows knowledge of what constitutes truthful relations. It is because photographers have not had the needed training that they are not qualified to judge of pictures with the highest qualities. They decide merely from a few photographic conventionalities more or less guided by a taste which would certainly be altered by the study required for the production of pictures. All we can boast of in photography are two or three who are partly trained, but who have been compulsorily led away by business considerations to which they have had to give their chiefest attention; two or three whose hearts are entirely in their practice, but who have had no preparation, or have greater zeal than knowledge; and perhaps not more than one to whom it was possible to plan out life with photography and art as chief devotion, and to study it as rationally required. All this may at some future time be altered, but at present there is nothing left but to give the influence in our competitions to the right artists, and with a free hand. We do not want awards given for smoothness and sharpness any more than for roughness and blurriness, nor in an art exhibition for the overcoming of what are considered difficulties of exposure and the like. What is required is the distinguishing of the photographs that have some high artistic qualities, and only those who have learnt to know by practice can authoritatively do this. Artists have not been given a free hand. They have been subjected to petty interferences, so that it is no wonder that it is difficult to secure any further assistance from them. It has been thought necessary to associate one or more photographers with them, and the artists have frequently deferred to these technical assessors, or have been entirely influenced by the ready photographic opinion confidently expressed, but their reliance on these photographic colleagues is but a proof that they are unable to find anything amongst the exhibits which comes into the category of good art to which they can assign the medals. They then presume that it is for some other qualities that the distinctions must be given.

Captain Abney has recently suggested that every visitor to an exhibition should be a judge, and that in that way agreement with the public sentiment would most closely be attained. But it is hardly public sentiment that might satisfy the exhibitors. The public are apt to go chiefly from hearsay and for a name. In a matter of art a cultivated electorate is essential, and only those who know ought to be on a board of judges.

In conclusion, I am of opinion that the time has come when, if exhibitions are desirable at all, they should be made somewhat of the kind I have outlined and argued for. My contention in favour of exhibitions without awards, and if with awards without classification in the art section, has been to urge that such is a more dignified and rational system, rather than that it is essentially different in kind from those in vogue. If open exhibitions are to be held at all, the element of competition must more or less enter, but the less prominent it is the better. I do not say that a system in which acceptation is the award is perfect, but it is competition only in the broadest and most manageable form, and it passes by most of the defects of classified competition. Competition may tend to the multiplication of third-rate execution, but it is of no service in stimulating to good art; it stifles originality and encourages imitation. Something may be found to be said in favour of classified competition, but the arguments adduced are not based upon a consideration of the bearing of the best art-cultivation upon the question.

The exhibition required, then, is one in which in the art section the best, and only the best, shall appear, both from at home and abroad; where these best are fairly and judiciously displayed by a competent hanging committee; where there shall be no classifying, every distinction of amateur and professional being ignored; where the pictures shall be more uniformly framed; where the scientific department shall be kept distinct and be properly worked up, exhibits from meteorologists, from astronomers, microscopists and their societies, from photo-mechanical printing process workers, and from those interested in industrial applications of photography being effectively sought and secured. There have been generous offers of assistance in this direction, and some rumours of such an exhibition being accomplished, but our hopes still await realisation.

A NEGLECTED DRY PLATE PROCESS.

BY WILLIAM LANG, JUN., F.C.S.

A friend of mine who dabbles in photo-micrography consulted me recently as to whether he could obtain a collodion plate in the dry state, which he could use from time to time as the occasion presented itself. For some of his more highly magnified specimens, the gelatine film he found to be not altogether suitable; he wanted to have all the benefits of the collodion support, but he also desired to have a plate that would entail no abnormal length of exposure. The process which I recommended to my friend was one which, so far as I have been able to ascertain, has found almost no exponents, and, as it has met the requirements of the particular case I have referred to, it may be of sufficient interest to the readers of the Photographic News to have their attention called to it.

In the spring of the year 1861, the South London Photographic Society—a society no longer in existence, but which in its day did some good work—organised a committee to report on some dry plate processes then before the photographic world. The processes at that time known as "dry" were those where collodion had a preservative applied, and the preservatives recommended were simply legion. Dr. Russell's tannin process had been but recently given out; and the process which interests us in the present communication was likewise a recent contribution. Hence, the finding of the committee on the two processes in question was as follows:—"The tannin process and Dr. Hannaford's modification they consider promising, but would at present more particularly call the attention of the experimental members of the Society to them." The processes actually reported on by the committee were the following: The Taupenot (or original collodio-albumen process), the Fothergill, Petschler and Mann's, Mr. Davis's collodio-albumen, and the gelatine; the latter, as then understood, having nothing in common with what we now designate as the gelatine, for, the gelatine being poured on the collodion plate, played

only the part of a simple preservative. Briefly considered, the two principal processes here referred to consisted in having, in the first instance, the collodion plate duly sensitised, and afterwards thoroughly washed. The Taupenot plate was prepared by pouring iodised albumen over the washed plate, draining it, and drying rapidly before a bright fire; at this stage the plates were insensitive, but the necessary quality of sensitiveness was given to the plate by an immersion in a bath of aceto-nitrate of silver. The Fothergill process consisted in having albumen poured over the plate, the albumen having had a certain amount of ammonia added to it.

In order to avoid stains, which often made their appearance, an immersion in a weak bath 5 grains nitrate of silver to 1 ounce water was finally adopted. The modification which Hannaford introduced was pouring over the washed plate a solution of albuminate of silver in ammonia. The plate, after this application, was thoroughly washed before being set aside to dry. The preparation of the preservative is a simple affair; the white from a fresh egg is taken and thinned with an ounce or two of water, well mixed, and to the dilute albumen 1 drachm of a 60 grain solution nitrate of silver is added; this causes a flocculent precipitate of albuminate of silver, which is dissolved by means of ammonia added drop by drop and well stirred. It is desirable to add no more ammonia than actually required, and the resulting solution should be opalescent rather than clear. The solution will keep for some little time, and should be put away in a non-actinic light. The development of plates thus prepared is conducted as follows: First of all, should the plate not have received a substratum, it will be necessary to go over the edges either with a varnish or a solution of india-rubber in benzole; without this the tender film of collodion would not bear the strain of the subsequent operations. Say that the exposure has been made—and it may be as rapid as if we were employing the ordinary gelatine plate—the first thing to be done after removal from the dark slide is to pour some alcohol over the collodion surface, letting it remain on for some little time, and, before applying the developer, it is necessary to wash the plate, very gently of course, for we are dealing with a very different material from that now so generally employed in photography. Development is now proceeded with, and, until the advent of eikonogen, it had been my habit to use a formula similar to Beachey's—that is, pyro with excess of sulphite. Latterly I have had recourse to the one-solution formula issued by Marion's people in connection with eikonogen. The plate is generally immersed in a tray containing the developer, and the appearance of image closely watched. The moment it appears the plate is withdrawn and washed. A prolonged immersion will tend to veil the clear portions. It remains to be here stated that the picture at this stage looks unpromising, the image being little more than a ghost. To bring out detail, recourse is now to be had to the silver intensification method, as in the "old days" of acid pyro development. For the benefit of those whose acquaintance with photography is only limited to the gelatine period, I may state that the intensifying solutions, as they were called, were made up as follows:—

No. 1.—Pyro	... ...	10 grains
Citric acid	... ...	25 ,,
Water	... ...	2 ounces
No. 2.—Silver nitrate	... ...	10 grains
Water	... ...	1 ounce

Immediately before using, a few drops of No. 2 are added to No. 1, and the solution poured on and off the picture, when it immediately begins to gain strength. The intensifying solution, when it begins to discolour, or, rather, when it begins to show a deposit, should be at once discarded and fresh solution applied. In a short time the proper density will be arrived at, when, after washing, the image may be fixed either in the ordinary hypo or a bath of potassium cyanide. In practice it is necessary to be careful that the light employed be thoroughly safe. Being a collodion process, one is apt to think that the same care in this direction is not necessary, but I know that some failures by a friend who experimented with the process, and who was inclined to throw it up as worthless, were shown clearly to have resulted from this cause. The addition of some acetic acid to the intensifier above given was found to be beneficial. The process is thoroughly well adapted for making lantern transparencies, either by contact or by reduction in the camera. The tone given by the intensifying method is by no means a displeasing one for lantern work, but it can be still further improved by toning with a weak solution of palladium chloride. If all the operations be carried out as described in the foregoing, it is possible to produce transparencies that have all the appearance of having been made by the ordinary wet plate method. The rapidity of the plate is great; I have produced transparencies from a negative of ordinary density by simply passing the same, having the prepared plate behind it in a printing frame, in front of an ordinary batswing burner.

At the Birmingham Convention, Dr. Hill Norris announced that he had produced a dry collodion plate equal in sensitiveness to a gelatine plate. I rather think subsequent investigations did not bear this out, but here has been a collodion process lying more or less dormant all these years—since 1861—giving as great sensitiveness as it is possible to desire. It will naturally be asked, if that be so, how does it happen that it has not come to the front? Perhaps it may be accounted for in two ways. Hannaford's method may have been overlooked from the fact that collodion emulsions came shortly afterwards to engage universal attention, to be followed by the all-absorbing gelatine emulsion, or perhaps no one had thought of applying the alkaline method of development to be followed afterwards by silver intensification. Hannaford's method of development was the acid pyro, and with this the plate appears to possess no great rapidity. It would be interesting if some of the readers of the PHOTOGRAPHIC NEWS would take up the process for themselves, and give the results of their experiences. I think enough has been written to enable anyone having the knowledge necessary to produce a wet collodion plate ready for exposure in the camera, to prepare a dry collodion plate by Hannaford's neglected method.

THE project initiated long since by Captain Abney, of scientifically testing the optical qualities of any photographic lens sent to Kew Observatory, may possibly be carried into practical effect before long. A small fee will be charged to the sender for the testing.

ENFIELD CAMERA CLUB.—A society has been formed called the Enfield Camera Club. Its objects are to popularise the art of photography, and afford mutual help in photographic pursuits by the interchange of prints and lantern slides; field days, meetings, and discussions; and giving advice and assistance to beginners. Meetings are held on the first and third Wednesdays in each month, at the Lancaster Coffee Tavern, Enfield, and the hon. secretary (*pro tem.*) is Mr. James Dudin, Roseneath, Chase Green Avenue, Enfield.

NEW PHOTOGRAPHIC LENSES.*

BY DR. PAUL RUDOLPH.

In conclusion, I append to this specification of my invention four examples, which serve to illustrate the manner in which the principles set forth in the preceding pages may be applied to the construction of different types adapted to various purposes. All dimensions (radii, thicknesses of lenses, and air-distances) are expressed by proportional numbers, the focal length of the whole objective being taken as unity. A simple multiplication of these numbers, with the focal length actually required, will suffice for obtaining the dimensions of any objective wanted.

The letters of the following tables correspond to the letters marked on the drawings (see p. 525). The different kinds of glasses are determined by the indices n_D and n_{GI} relating respectively to the D line of the spectrum and to the Hγ-line of the spectrum of hydrogen. In order to render obvious the character of the pairs of glasses used in each system, I have appended to each kind of glass the value of the relative dispersive power $\left(\frac{\Delta n}{n-1}\right)$ where Δn has been calculated for the interval from the D to the Hγ-line of the spectrum, while the value of n_D is taken for n.

Examples.

TABLE I.

Objective of the kind shown by fig. 1, consisting of two positive systems having greatly differing focal lengths.

Effective aperture: 0·056. Angle of field about 110°.

Radii:	Thicknesses of Glass:
$r_1 = +\ 0{\cdot}2041$	$d_1 = 0{\cdot}013$
$r_2 = +\ 0{\cdot}0962$	$d_2 = 0{\cdot}025$
$r_3 = +\ 0{\cdot}3329$	$d_3 = 0{\cdot}067$
$r_4 = -\ 0{\cdot}1589$	$d_4 = 0{\cdot}013$
$r_5 = -\ 0{\cdot}0962$	Distances of diaphragm B:
$r_6 = -\ 0{\cdot}1798$	$b_1 = 0{\cdot}013$
	$b_2 = 0{\cdot}057$

Kinds of glass employed:

	n_D	n_{GI}	$\frac{\Delta n}{n-1}$	
L_1:	1·55540	1·57036	0·0269	normal pair of glasses;
L_2:	1·51900	1·53047	0·0221	focal length = + 1·1275.
L_3:	1·57360	1·58642	0·0224	abnormal pair of glasses;
L_4:	1·54763	1·56316	0·0284	focal length = + 3·3785.

(The objective of this combination, represented in full size by fig. 1, has a focal length of 24 cm.)

TABLE II.

Objectives of the kind shown by fig. 2, consisting of two positive systems having but slightly differing focal lengths.

Effective aperture: 0·166. Angle of field about 75°.

Radii:	Thicknesses of Glass:
$r_1 = +\ 0{\cdot}2559$	$d_1 = 0{\cdot}012$
$r_2 = +\ 0{\cdot}1029$	$d_2 = 0{\cdot}062$
$r_3 = +\ 0{\cdot}4122$	$d_3 = 0\ 012$
$r_4 = -\ 0{\cdot}2058$	$d_4 = 0{\cdot}029$
$r_5 = +\ 0{\cdot}4122$	Distances of diaphragm B:
$r_6 = -\ 0{\cdot}1897$	$b_1 = 0\ 0656$
	$b_2 = 0{\cdot}0656$

Kinds of glass employed:

	n_D	n_{G_1}	$\frac{\Delta n}{n-1}$	
L_1:	1·57973	1·59357	0·0239	normal pair of glasses;
L_2:	1·50546	1·51610	0·0210	focal length = + 2·325.
L_3:	1·53789	1·55250	0·0272	abnormal pair of glasses;
L_4:	1·57360	1·58642	0·0224	focal length = 1·426.

* Continued from page 525.

(The objective of this combination, represented in full size by fig. 2, has a focal length of 35 c.m.)

TABLE III.

Objective, such as shown by fig. 3, consisting of two positive systems, with nearly equal focal lengths.

Effective aperture: 0·180. Angle of field about 70°.

Radii:	Thicknesses of glass:
$r_1 = +\ 0{\cdot}3408$	$d_1 = 0{\cdot}015$
$r_2 = +\ 0{\cdot}1217$	$d_2 = 0{\cdot}044$
$r_3 = +\ 0{\cdot}6815$	$d_3 = 0{\cdot}015$
$r_4 = -\ 0{\cdot}3894$	$d_4 = 0{\cdot}044$
$r_5 = -\ 0{\cdot}8763$	$d_5 = 0{\cdot}019$
$r_6 = -\ 0{\cdot}1947$	Distances of diaphragm B:
$r_7 = -\ 0{\cdot}3213$	$b_1 = 0{\cdot}122$
	$b_2 = 0{\cdot}024$

Kinds of glass employed:

	n_D	n_{G_1}	$\frac{\Delta n}{n-1}$	
L_1:	1·55540	1·57036	0·0269	normal pair of glasses;
L_2:	1·51310	1·52461	0·0224	focal length = 1·741.
L_3 and L_5:	1·53984	1·55463	0·0274	abnormal pair of glasses;
L_4:	1·57360	1·58642	0·0224	focal length = 1·809.

(The objective of this combination, shown by fig. 3, has a focal length of 20 cm.)

TABLE IV.

Objective consisting of a positive principal system and a corrective system having a negative focal length.

Effective aperture: 0·056. Angle of field about 100°.

The letters correspond to those marked in fig. 1.

Radii:	Thicknesses of glass:
$r_1 = +\ 0\ 1928$	$d_1 = 0{\cdot}012$
$r_2 = +\ 0{\cdot}0938$	$d_2 = 0{\cdot}056$
$r_3 = +\ 0{\cdot}1251$	$d_3 = 0{\cdot}034$
$r_4 = -\ 0{\cdot}3127$	$d_4 = 0{\cdot}010$
$r_5 = -\ 0{\cdot}0834$	Distances of diaphragm B:
$r_6 = -\ 0{\cdot}1511$	$b_1 = 0{\cdot}084$
	$b_2 = 0{\cdot}034$

Glasses employed:

	n_D	n_{G_1}	$\frac{\Delta n}{n-1}$	
L_1:	1·51282	1·52421	0·0222	normal pair of glasses;
L_2:	1·57973	1·59357	0·0239	focal length = — 15966.
L_3:	1·51680	1·52755	0·0208	normal pair of glasses;
L_4:	1·56490	1·58215	0·0305	focal length = + 0·5956.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—

In a photographic objective, the combination of two distinct systems of lenses, each composed of single lenses cemented together, the positive element of one system having a higher, the positive element of the other system a lower refractive index than the respective negative elements cemented thereto, and each system being in itself approximately achromatic, substantially as described.

INTERNATIONAL BIBLIOGRAPHICAL CONFERENCE.—An International Conference is to be held this summer in Antwerp, of publishers, printers, and others connected with or interested in books. Simultaneously, the Society of Industry, Art, and Commerce will organise in its rooms an exhibition which will include photographic presses and specimens of processes for the photographic illustrations of books.

BRITISH PHOTOGRAPHIC UNION.—The organising council of the above proposed union meets at the Polytechnic School of Photography on Wednesday evening, July 16th, at eight o'clock. Any workman who can get three or four of his fellow workmen to delegate him may attend. The subjects to be discussed are the form, rules, and methods of the union; the appointment of acting officers for London; the form of appeal for funds; arrangements for the institution of the examining body.

Notes.

Mr. Andrew Tuer writes pleasantly in the *English Illustrated Magazine* on "The Art of Silhouetting." One of the first and best silhouettists who practised in this country was Augustin Amant Constance Fidèle Edouart, who was born at Dunkerque in 1788, and found his way to London as a refugee in 1815. It was in 1825 that Edouart took to silhouette cutting as a profession. Spending an evening with some friends, he was shown profile likenesses of some of the family taken with a machine. These Edouart condemned, but the daughters pronounced them perfect. Challenged to do something better, Edouart seized upon a pair of scissors and the cover of a letter, and, putting the father in position, "in an instant I produced a likeness." The paper being white, the snuffers were resorted to for blacking it over. Natural skill triumphed over inexperience and difficulty.

The most interesting portion of the volume is that which foreshadows the experience of the photographer. When Edouart first began cutting out paper likenesses it was on the understanding that if they were not approved others would be taken. Some of his clients returned in a day or two saying they were dissatisfied with the old one, and they would destroy it at home. When Edouart afterwards insisted upon these old likenesses being returned and destroyed before a new one was began, complaints decreased. A young sitter highly approved his likeness, but on a friend pointing out that he would look better in a dress coat—he was taken in a frock—another was somewhat rudely demanded. This was refused, and the sitter ultimately refused to pay for the first and only likeness; so Edouart in revenge cut the body of the silhouette from the waist downwards into a screw, made an alteration in the top of the hat, and wrote underneath, "Patent screw for five shillings." In this altered condition the silhouette was exhibited in Edouart's window, where it was recognised by amused friends, and it was not long before satisfactory terms were made with the artist. How few photographers are there who have not had an experience of a "serew" of this nature! By the way, to have rendered Mr. Tuer's article complete, some mention should have been made of Mr. Francis Galton's photographic silhouettes, which he secures by placing the sitter in a long passage, at the end of which is an illuminated screen. The camera is, of course, stationed at the other end.

In the interesting book just published entitled "My Mistress, the Empress Eugénie," the authoress, Madame Carette, imparts a hint which the much photographed ladies of to-day might utilize with advantage. She gives an amusing account of one of the court ladies, the Countess de Wagner, who had considerably passed beyond the charms of her youth and even middle age, but who still fancied herself young. As a matter of fact, she was, although over seventy, exceedingly well-preserved. The Empress often went into raptures over her unfailing youth, and this pleased her greatly. One day, she brought her portrait to the Tuilleries, in which she appeared to be scarcely thirty years old, but it did really resemble her, and the Empress could not conceal her astonishment at its artistic flattery. "I wished to leave my friends a pleasing souvenir," said the Countess, "and I therefore instructed the photographer as to what he was to put in and what omit, and I think have succeeded in getting a pretty portrait."

This seems to us an admirable idea. Ladies who wish to please themselves should not fail to take advantage of the retoucher's art, and give their own instructions. There is only one doubt which crosses our minds. The Countess de Wagner's portrait, it is said, resembled her. Now we are inclined to think that the photographer, in spite of the lady's instructions, used his own discretion; but no doubt the Countess imagined that her directions had been faithfully carried out. The moral of this is, that the diplomatic photographer should listen to all the instructions of his fair sitter, but exercise his own judgment. They will not quarrel with him if he makes them look younger, and yet preserves some sort of likeness.

In the same interesting volume appears a reference to a certain photograph which played a mysterious and unexpected part in regard to the surrender of Metz. It will be remembered that when the Empress and the Prince Imperial fled to England, a M. Régnier visited them at Hastings. At his earnest request, M. Filon, the Prince Imperial's tutor, gave him a photograph signed by the Prince Imperial; and this little circumstance expanded to unexpected magnitude. M. Régnier presented this photograph to Marshal Bazaine at Metz, as a pledge of the powers with which he was charged to negotiate with him, though what these negotiations were was not known. The whole of this transaction has remained in obscurity, and it was only later, when events unravelled themselves, that the treachery of M. Régnier in presenting the photograph signed by the Prince Imperial was understood.

It would be a salutary caution to peopl who fill up cheques carelessly, if the photograph published in the *Banker's Magazine* of this month were reproduced and copies hung in every banking establishment. There is one numeral which is extremely useful to the dishonest person. All he has to do when he comes across a cheque made out for £8 is to add the letter "y" to the word "eight," and an "0" to the figure, and, with two strokes, he thus converts £8 into £80. This seems to have been the case with a cheque presented to the Birkbeck Bank. The original cheque was drawn for £8 5s., but when presented it appeared as £80 5s. The bank paid the money, and the drawer sued them for the amount over-paid. A photograph of the cheque is given, as we have already noted, in the *Banker's Magazine*, and proves conclusively that the cashier was not in fault, as there is no indication that the additions were made by a swindler.

It is taking the French papers a long time to discover that the Americans intend to do honour to the memory of Daguerre by raising a monument to him. Now that the discovery has been made, one of the lively Parisian journals suggests that at the foot of the monument should be placed a penny automatic likeness taker. As this is the lowest form of photography with which the world is yet acquainted, it is not quite certain whether the paper in question approves of the idea of a monument. Since it speaks elsewhere of Daguerre as *one* of the discoverers of photography, perhaps it wishes the names of Niepce, Davy, Wedgwood, Talbot, and even Scheele, to be included. If so, the argument is not without justification.

A Parisian paper gravely states that the automatic portrait-taking machine was anticipated by an enterprising jeweller who, on the first of April last, introduced his invention to the public. The apparatus is in the form of a clock which automatically marks the day, month, and year. On the side is an invitation to "Drop five centimes in the slot and see your likeness." When you have dropped your centimes in the slot as directed, an inscription, reading "Here it is," appears. At the same instant up bobs a donkey's head with large outstretched ears—your likeness! It is a new form of an old pleasantry, and if the apparatus does not take a photographic portrait, it certainly takes the public taste.

The *Chemical News* draws attention to a question which always troubles judges and juries, namely, the discrepancy which is invariably seen when scientific witnesses give their evidence. Our contemporary rightly points out that the disagreeable spectacle of men of equal scientific reputation disagreeing or appearing to disagree over some vital point, and the cross-examination of the scientific witness by a counsel who is totally ignorant of the subject under consideration, and who has been hastily and imperfectly coached, do damage, not only to the reputation of the witness, but bring science itself into contempt. This kind of thing has always been witnessed when any action turning upon a question of photographic chemistry comes before the law courts. The remedy proposed is that a scientific witness should make a written statement, but should positively decline to step into a witness box. We do not know whether this is a good way out of the difficulty, and judging by the light of recent photographic actions at law, probably the best plan would be for each scientific witness on either side to give his evidence, and let it be adjudicated upon by a scientific arbitrator. The scientific points settled, the legal questions involved would then be an easy matter to decide by the usual tribunal.

Photographers are, perhaps, as much interested in the state of the weather as any other class of the community, for it is certain that their incomes must fluctuate with its condition. No one cares to be photographed except when arrayed in the chief glories of her wardrobe, and such gorgeous vestments are not for rainy days. This midsummer will long be remembered for wetness, and the general stagnation of photographic work which it has brought about; for it is not only the photographer who suffers—the damp percolates through and affects every trade connected with the art. A wet fortnight at the end of June means that millions of plates are unexposed that ought to have been exposed, and that thousands of reams of paper which ought to have borne pictures remain blank. So the wet weather affects all, from the photographic monarchs of West End studios, to the poor fellow who holds himself in readiness to take your portrait on the sands for sixpence.

Writers who try to be comic have often tried to make fun of the circumstance that when two strangers meet, their conversation invariably opens with a remark about the weather. But in this country, at least, when the weather is so erratic in its behaviour that one knows not whether the morrow will bring forth scorching heat or icy cold, it is only natural that men should have the matter uppermost in their minds. The thing to wonder at is, that with so many millions of persons making remarks and observations of this kind every day of their lives, no one yet has proved himself to be a reliable weather prophet.

The number of persons armed with cameras one meets in the course of a day's outing is marvellous. It does not seem to matter in what direction you go, the ubiquitous photographer is bound to turn up. Of course there are favoured spots. For instance, up the river cameras "come not in single spies, but in battalions." The question naturally suggests itself, if anglers are allowed special privileges in the way of reduced fares, why should not amateur photographers? This is a matter which has been mooted at several photographic societies, and, for aught we know, the railway companies may have been approached on the subject; but certain it is that up to the present the photographer has to pay full fare. Probably he always will; for the argument may be that photographers are becoming so numerous that a reduction of fare to them would mean a reduction generally.

Let us hope that those photographers who are fortunate enough to get away to the sea this year may have a break in the clouds to look forward to, and that many seascapes, and glimpses of life on the shore, may compensate them for the wet season which they are now experiencing. Should any of them roam with their cameras in that part of our coast which borders "The Downs," they should take with them a book which has recently been published, "Memorials of the Goodwin Sands," by Gattie. This gives a full account not only of the treacherous sands, but of the coast near which they lie, and it is very pleasant reading. It always gives a zest to photographic touring when the worker knows something about the district in which his pictures are taken.

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

COLLOGRAPHIC PROCESS BY M. BALAGNY—COLOURED SCREENS FOR ORTHOCHROMATIC WORK—THE "CRISTALLOS" DEVELOPER—FLEXIBLE NEGATIVE FILMS.

Collographic Process by M. Balagny.—The fullest details of the divers phases of this process, which, as is known, is based upon the use of a pellicular printing surface, have been furnished by the author at a special conference. It is, in short, a sort of photo-lithographic process analogous to the Raymond autocopyist process, but with this difference, that the gelatinised paper which, in the autocopyist process, forms the printing plate, is covered with gelatine free from any other substance. In Balagny's pellicle the support is coated with gelatino-bromide of silver. According to our confrère, this substance, which, with regard to gelatine, is inert, has the effect of increasing the sensitiveness to the light of the film when bichromated. In our view this is a statement which remains to be proved, but what is true—a fact which has been already recognised by other experimentalists, notably by Husnik and Woodbury—is, that the presence of a pulverulent body plays the part of causing reticulation. We may, in this case, after insolation and rapid washing, take prints in fatty ink, whilst in the ordinary collographic process it is indispensable to dry the film in order to produce reticulation, after which it is moistened and impressions are taken from it. In support of his interesting explanation, M. Balagny offered to the Society, as illustrations for its *Bulletin*, 1,500 prints representing the installation of Class XII. at the *Exposition Universelle*.

Coloured Screens for Orthochromatic Work.—M. Stebbing, following the indications given by M. Vidal, has prepared some pellicular coloured screens for orthochromatic photography, and presented specimens of them. These screens are formed of discs of suitably coloured gelatine imprisoned between two coatings of normal collodion. There are four degrees of colouration. No. 4, which is the maximum, requires an exposure of from six to twelve times the normal duration—that is to say, of an orthochromatic plate employed without a screen. No. 1 is coloured to one-fourth that extent, and requires a correspondingly shorter exposure—that is, of from one and a-half to three times the normal exposure. These screens are very well prepared, and will render great service, seeing that they may be used in the place of the diaphragm, and inserted in a double diaphragm made of black paper. The interposition of an orange yellow film should not alter the focal point.

The "Cristallos" Developer.—This developer, presented in the names of Messrs. Jeannin and Jumeau, is one of great energy. It appears to be a mixture of hydroquinone and potash. According to M. Audry, who has tried it, it acts violently, and fogs the shadows. He finds it very energetic, but insufficiently restrained. It must be borne in mind that it has to be diluted with four times its volume of water.

Negatives on Flexible Films.—M. Morizet presented 300 negatives taken by him in Upper and Lower Egypt on flexible films. These negatives are very complete. Lantern slide reductions were projected on the screen, and I noticed particularly views of a square in Cairo, the rapids of the Nile, and the Place de Longsor.

The meeting was not large, a fact accounted for by the departure of many to the country and the seaside.

IMAGINING AND IMAGING.*

BY PHILIP H. NEWMAN.

THERE never was so much good painting as there is now; the present Royal Academy Exhibition is full of most admirable work; the *technique* gets higher and higher annually. But now go and ask the general public what they think of this Exhibition; the answer is, "The dullest we remember." The general public are not artists, but, as usual, they are very keen critics, and can generally tell when they see a good thing without the inspiration even of a newspaper. I walked through the rooms of the Academy the other day with a highly cultured girl—no painter, but knowing our National Gallery and some of the galleries of Europe, who could trace the influence of Veronese and Rubens in Makart, and Velasquez in Munckaksy, and could tell a Fortuny as well as she could tell a line of Shakespeare, or a bar of Beethoven.

"Well, my dear, how do you like the Exhibition?"

"Not at all; there is only one picture I would buy; I should like that."

It was a single figure, full of repose, and worthy of Greek art; the nature in it, like that art, had filtered through the passion of the painter. Here, at least, there was imagining as well as imaging.

Mr. Emerson has written other books besides the one I have been talking about, and published many photographs from original negatives. It would not be fair to him, having said so much, if we did not say something about these, and it is only fair to see how his wholesale repudiation of book-teaching in art, and his leaning entirely on nature, has helped him. In one of the books devoted to the Norfolk Broads, Mr. T. F. Goodall is a collaborator, and writes, in an article on landscape: "The roughest sketch, in which the ground and the objects against the sky are painted in a mass in right relation to it, is really more finished than the most laboured work wherein the essential truth is wanting." This may be granted at once, but then one looks to see it illustrated by the accompanying photographs. Unhappily for Mr. Emerson and Mr. Goodall, photography seldom gives objects against the sky in right relation to it; certainly, samples are sadly wanting in the book in question. This may be the fault of the copy, or processes of printing may have improved since. Let us pass on to another book, and look into the "Idylls of the Norfolk Broads"; plate 6, "Bathers." Here we have no question of printing, but of simple composition. The backs of two bathers rise out of the water side by side, one a little in advance of the other, however; the nearer one spreads his arms a little to lead up the angle of the bank and take away from the verticalness of the arrangement, the other bather keeps his arms down, one being partially hidden by his body. Now, all artists will admit that the human back is a beautiful object, delightful to draw and model, in its leading lines and subtle undulations, and Mr. Emerson missed a great opportunity here of showing himself both a photographer and an artist; anything more commonplace and less idyllic than the arrangement of these two backs it is difficult to conceive. I refrain from making fun; any one may do that where they cannot make sense; but one leaves the picture with a sort of suspicion that Mr. Emerson is making fun of us. We should like to ask him if the idyllism of the picture is supposed to lie in the backs, or in the background. I cannot determine; neither smudginess nor backs like these are idyllic to me. Plate 9, in the same collection, represents something going on with a hay waggon, which at first sight seems to be part of a tree; on the right-hand side of the picture a man is leading the horse towards us, and this emphasises the right angle made by the side of the waggon, and the ground cut clean against the sky; a little bunchy tree is near the horse and towards the horizon, while another man is near another small tree on the opposite side of the picture, and serves only to enforce the emphasis of the right angle already mentioned. I can only suppose that this arrangement is done in wilful defiance of any rules of composition whatever, and pass on to "Pictures,

* Continued from page 516.

in Field and Fen." "Ah!" you say, "how charming Mr. Emerson can be when he chooses." This "spring idyll," for instance, a girl peeling potatoes; note the turn of the girl's head in relation to the line of the shoulder, and its continuity in the branch of the tree: the very pail is ordered in its arrangement with the rest of the picture. But is this accident or design? It would be pleasant to give Mr. Emerson credit for this and several other pictures—"Ploughing" and the "Stickle-back Catcher" are excellent. But what are we to say when we find them in company with such wooden compositions as the "Dame's School" (which might have been so easily corrected, by the way), the atrocious "Winter's Morning" (look at the vaunted values here), and the hideous "Going to Market"? Well, there is nothing to be said but that if art is to be got by simply going to nature, Mr. Emerson does not show us enough of the way—at least, in the works I have referred to. Is there no sunshine ever in the fen country, that most of these photographs have such leaden skies? Or does our author belong to a school that enunciates the dogma that sunshine is unpaintable and brilliancy vulgar? If so, Fortuny, and some of the works of some of the greatest living painters, might teach him better. This last book I mention, "Pictures in Field and Fen," is prefaced, so to speak, with these lines from Browning:—

> "So British public, who may like me yet
> (Marry and Amen), learn one lesson hence
> Of many which whatever lives should teach:
> This lesson, that our human speech is naught,
> Our human testimony false, our fame
> And human estimation words and wind.
> Why take the artistic way to prove so much?
> Because it is the glory and the good of art,
> That art remains the one way possible
> Of speaking truths, to mouths like mine at least."

A more unfitting quotation to head such a book as this was never seen, save that it is capable of a double application, rich in its condemnation of the author. If Mr. Emerson has as much reverence for art as he pretends to for nature, we had been spared many of these so-called pictures, because many of them were not worth the taking. Many he would have re-arranged, and could have done so quite easily. One slight reference to the "Soldiers Bathing in the Arno" might have corrected those woeful backs; and many of the landscapists he has slighted would have saved him from the stumbles he has had elsewhere. I trust, for the sake of photographers, that his advice on technical matters is more reliable than his artistic guidance. As to his hints on art, I cordially agree with the man who called them "Tupperisms." His pictures, at least as printed in his folios, do not bear out his standard of excellence or teaching. Let us dismiss this disciple of nature as quickly now as he has affected to dismiss time-honoured names in art, and let him know and bear in mind that while in characterising a learned reverend, if oft enthusiastic criticism, as "splendidly false," his own has too often the latter quality, but never the former. I unhesitatingly say that he has written on art without adequate knowledge and reflection, as he has frequently imaged nature without refined taste or imagination.

There has been much discussion lately on the subject of beauty; it may be difficult to exactly define it, or how much of it is necessary in the constitution of a work of art. It is too wide a question to more than mention now. It may be worth saying, however, that beauty lies more in order and consistency than is often allowed, and works that do not possess these qualifications proportionately fail to charm us. Beauty, moreover, is an individual perception, more or less, but it is distinctly capable of wider appreciation, the more apparent is the consistency and order I allude to. Thus, in a picture or photograph of a group of figures there must be a principal figure or a principal group, and it is essential for our satisfaction that that principal figure should be principal in every respect—force of light and shade, mass, &c. If there is a story to be told, it gains immensely in directness by such means. These things are exceedingly difficult to talk about, but beauty in composition is so dependent upon them that they must not be passed over. I am the more sensible of this because of some recent terrible examples of photography that have come before me, where there were several women in white aprons; and some that were smaller in size and more in the background were as white as that which should have been principal. Perhaps I am rather urgent on this point of ordination and subordination. I fail, however, to see good composition without it; it is my *ism* or idiosyncrasy. One artist of our own time is accused of this shortcoming, and one is accused of that. One artist of the greatest poetical insight and refinement, a very Achilles equally in his retirement as when he is moved to put out his strength, is accused of soft, waxy texture. The public and the critics seem quite oblivious of the fact that his aim is not to imitate nature in his textures so much as to move us with his design. It would be heart-breaking to think of the future of art in this country were it not that one knows the tide of fadisms is at its flood, and while it rushes on, the poet painters who see art, and beauty, and consistency, are as firm as the rocks they rest upon, until the tide has turned, and when their voices will again be listened to. The young men who have any real art feeling in them will have made their studies from nature, and will have been as dissatisfied with them as were their great predecessors with theirs. It may be that the foundations laid will be the more solid from the long continuance of the realistic and naturalistic craze, so good coming out of evil; for certainty of draughtsmanship and knowledge of light and colour will be at the facile command of those who, ceasing to make unsatisfactory images, will develop their imagination and give us works of art. We will at least hope so.

But you ask, What has all this to do with the Photographic Convention of Great Britain? Much, everything, because it is to you that art looks in the present day to be in the van of this desirable movement; to you who, having many sins of omission and commission to answer for in the past, whereby you have in a great measure been responsible for this unstudied naturalism which is sapping the foundation of the finest taste; you, by your multiplying processes and waistcoat-pocket cameras, who have been tempted to photograph everything you have seen—good, bad, and indifferent. I am speaking plainly but generally (of course, there are grand exceptions). It is to you I say—artists, photographers, and photographic artists—in the cause of art I appeal; you have a great future before you if you will only exercise a dignified reserve that a dignified profession demands, and never photograph anything, under any circumstances, that shall not, when it is printed, be a joy because of its beauty.

I am certain that in the present all who have the real interests of art in England at heart will uphold me in this appeal, as I am equally persuaded that Rejlander and the greatest names in the past, and those who are yet in the future, will approve of your doing your utmost with these high aims in view. Pray believe me, I am not ignoring much, very much, good work that has been done, and I know is being done. I should like to mention names, but must not do so for fear of invidious comparison. If I have been unjust in anything I have said, it has not been with intention, and I beg forgivenesss. The book I have so often alluded to was put into my hands for the first time just as I was asked to write this paper, that I might have some knowledge of some of the things that had been said on the art side of photography. I was amazed when I had read the book at its audacity, and more amazed when I heard that its teachings were gaining ground. I was told that photographers, however, would be glad to be spoken to on the art question, notwithstanding. I have spoken to the best of my power and belief. If I have spoken loudly, I may be pardoned for art's sake at finding its temple shattered and its gods dispersed, that Mr. Whistler or Mr. Anybody else should occupy the site. Not a word against Mr. Whistler, who has shown himself often and often a great artist. All I contend for is, that "naturalism" is not the only nor the highest art in the land. Let us, indeed, be termed Philistines and rejoice in the honour thereby conferred on us; the rather keeping to our own gods than falling down and worshipping stocks, and stones, and nature unanimated by the divine gift the soul of man has the privilege of conjuring up and

investing it with. I would rather go back a hundred years and more; I say it seriously. It would be better for art, better, far better for us all, to go back to the sickly sentimentality and bathos of the last century, that culminated in the lachrymatory effusion of uncle Toby's recording angel, or, more practically, to the primary artistic principles of our great grandmothers' samplers, than reach the logical bourn of naturalism where imagination dies in imaging, and over whose portals might well be written, "Abandon hope all ye who enter here."

DEVELOPERS USED BY GERMAN PROFESSIONAL PHOTOGRAPHERS.*

BY JULIUS F. SACHSE.

ANSELM SCHMITZ, Königl. Hof. Photograph, Koln.—Developer—The sulpho-pyrogallol-developer. Advantages—The developer furnishes brilliant negatives of superior detail. Composition—(A) Water, 64; sulphite of soda, 16; citric acid, 1; pyrogallol, 1. (B) Water, 64; sulphite of soda, 8; carbonate of soda, 32. Developer—Equal parts A and B, diluted with 20 parts water. Equal results have been attained with other formulæ; the advantages which I claim are not the result of this formula in particular, but of pyrogallol in general. I have tested all other developers as they appeared, among others the much vaunted eikonogen, but soon came to the conviction that pyro is far superior. For short and instantaneous exposures, eikonogen in its various combinations has been persistently praised, as it was claimed that greater results and detail were to be obtained with the new agent than any other. I have, however, obtained results far greater with pyrogallol. Accelerator—None.

A. Stock, Hof Photograph, Guben.—Developer—Pyrogallol. Advantages—Very rapid development, complete in three minutes; at the same time, vigorous results. In a few minutes every grade of strength can be attained. Composition—(A) Pyrogallol, 15 g.; sulphite of soda, 30 g.; water, 500 g. (B) Pure soda, 100 g.; water, 1,000 g. For use, equal parts A and B, diluted with one-third water with several drops of bromide. For under-exposed plates, use with bromide or water.

It will be seen by the responses given that one-half of the whole number still adhere to the favourite German stand-by—ferrous oxalate—their main reasons given being the simplicity, uniformity of action, cheapness, cleanliness, and freedom from fog. Seven of the whole number have become converts to the new candidate for photographic favour—viz., eikonogen—on account of the quicker action, allowing of shorter exposure, together with finer grain and detail; the factor of price is also an item in its favour.

Three are equally enthusiastic in their praise of pyro, which we in this country can agree to. One is a convert to hydrochinone, while another promulgates the questionable formula of mixing hydrochinone and eikonogen. It will be noticed that ten photographers only approve of an occasional preliminary bath (accelerator).

The attention of both professionals and amateurs is called to the fact that the foregoing all relate to the department of studio portraiture only.

C. Baumann, Hofphotograph, Dortmund.—Developer—Eikonogen. Advantages—Cleanliness and clearness of plates, wealth of fine tones, combined with strong high-lights, when extra rapid plates are used. Composition—The usual formula: (A) Sulphite of soda, 200 g.; water, 3 litres; eikonogen (dissolved warm), 50 g. (B) Cryst. soda, 150 g.; water, 1 litre. For use, 3 parts A, 1 part B. In the fixing bath no sulphite of soda is used, as it is superfluous, and in my experience the plates are destroyed by leaving them in a bath of that kind any length of time. Accelerator—None.

J. H. Brasehoss, Cöln.—Developer—Eikonogen. Advantages—Saving thereby half of the exposure. Solution can be used repeatedly, is lower in price than all others, and is absolutely non-poisonous. Composition—(1) Eikonogen, 50 g.: sulphite of soda, 200 g.; water, 3,000 g. (2) Soda, 300 g.; water, 2,000 g. Accelerator—None.

Julius Dörstling, Hofphotogr., Eisenberg i. A.—Developer—Until within three months ferrous-oxalate, since then, with preference, eikonogen. Advantages—Shorter exposures, detail in shadows and high-lights, and transparency at the same time. Strong negatives, therefore more rapid printers; greater permanency. Composition—Dissolve 200 g. of sulphite of soda in 2½ litre of rain-water, then rub up 50 g. of eikonogen in a mortar, and pour into an earthen pot in which there is half a litre of hot water. After both are dissolved, pour the hot solution into the 2½ litres of soda; then shake up well. No. 2—Dissolve 150 g. of soda cryst. in one litre of water. Three parts No. 1, one part No. 2. Accelerator—None.

Otto Faltz, in Eberswalde.—Developer—Eikonogen. Advantages—Quick and active action. The picture develops brilliant and complete detail in the deepest shadows. The developer can be used repeatedly. Composition—Water, 600 g.; sulphite of soda, 100 g.; potash, C.P., 40 g.; eikonogen, 20 g. Dissolve and boil in a Florence flask: use when cold. Accelerator—None.

W. Gilles, Unna.—Developer—Eikonogen, since six months ago, with good results. Advantages—Detail in the shadows; much quicker printing negatives than oxalate; shorter exposure; shading of certain portions of the negative in printing lessened. Composition—(1) Distilled water, 1,500 g.; sulphite of soda, 100 g.; eikonogen, 25 g. (2) Distilled water, 1,000 g.; ordinary soda, 150 g. For use, three parts No. 1, one part No. 2. Both solutions keep; No. 1, made in December, was without change in February. Accelerator—None.

F. Hundt, suc. to Hülswidt-Münster i. W.—Developer—Eikonogen. Advantages—The enormous reducing power of the agent, with a finer silver grain than, in our experience, is attainable with any other developer. We use extra rapid plates exclusively, which, with pyro and oxalate, give a very coarse grain. With eikonogen, however, the grain is so fine as not to be perceptible. Shorter exposures than with any other developer; cleanliness. Composition—(1) Sulphite of soda, 200; water, 3,000; eikonogen, 50. (2) Carbonate of soda, 150; water, 1,000. For use, three parts 1 and one part 2, bromide 1-2 drop 1 : 10. When the high lights stand out strong, pour off the developer and finish with fresh (without bromide). In this manner we obtain exceedingly brilliant, harmonious negatives. Accelerator—None.

(*To be continued.*)

* Continued from p. 456.

ROYAL INSTITUTION OF GREAT BRITAIN.—At the general monthly meeting on Monday, July 7th, Messrs. Thomas Townsend Bucknill, Q.C., Edward A. Harvey, Malcolm Morris, F.R.C.S., and William Thomas Rabbits, F.L.S., were elected members of the Royal Institution.

Patent Intelligence.

Applications for Letters Patent.

9,413. J. B. BROOKS, 115, Great Charles Street, Birmingham, "Developing Baths."—June 18th.

9,474. J. S. FOLEY and L. C. H. MENSING, 166, Fleet Street, London, "Appliances for Exposing Transparent Photograph after Receipt of Coin."—June 18th.

9,497. F. A. WALTON, 12, Cherry Street, Birmingham, "Photographic Picture Stands."—June 19th.

9,498. H. WILKINSON, Massey Park, Liscard, Cheshire, "Combined Tray and Cover for Photographic Plates."—June 19th.

9,507. J. B. BROOKS, 115, Great Charles Street, Birmingham, "Photographic Printing Frames."—June 19th.

9,511. J. PARKINSON, S. FAWCETT, and C. F. PARKINSON, South Regent Street, Lancaster, "Photographic Shutters."—June 19th.

9,538. W. REBIKOW, 47, Lincoln's Inn Fields, London, "Manufacture of Emulsions and other Materials Sensitive to Light."—June 19th.

9,542. L. KOCH, 6, Bream's Buildings, London, "Photographic Apparatus."—June 19th.

9,549. H. RANSOM, 4, South Street, Finsbury, London, "Shutter."—June 19th.

9,593. C. B. SKINNER, 38, Chancery Lane, London, "Cameras."—June 20th.

9,715. A. J. BOULT, 323, High Holborn, London, "Cameras." (H. Thumber, Germany.)—June 23rd.

9,818. W. F. GREENE, 321, High Holborn, London, "Cameras."—June 24th.

9,868. W. H. PEXTON, 77, Chancery Lane, London, "Magic Lantern Slides."—June 25th.

9,893. J. W. SWAN and J. LESLIE, Lauriston, Bromley, Kent, "Transparent Flexible Photographic Films."—June 26th.

9,898. R. EAGER, 57, Bath Street, St. Heliers, Jersey, "Doubling Shutter for the Production of two Positions on one Plate of any Size with Fixed Lens."—June 26th.

9,934. W. STOCKS, 6, Bream's Buildings, London, "Lamps for Optical Lanterns."—June 26th.

9,981. G. W. SHAITER, 35, Southampton Buildings, London, "Changing Boxes and Slides."—June 27th.

10,012. G. J. SERSHALL, 373, Lodge Road, Birmingham, "Vignetting Media."—June 28th.

10,145. M. GUTTENBERG, 8, Quality Court, London, "Mirror Photo-Enlargement Process."—July 1st.

10,165. G. E. ALDER, 98, North End, Croydon, "Automatic Production of Photographs."—July 1st.

10,442. W. PALMER, 47, Lincoln's Inn Fields, London, "Cameras."—July 5th.

Specifications Published.

11,555. *July 19th*, 1889.—"Coating Photographic Plates." JOHN HENRY SMITH, Ph.D., Photographic Chemist, 9, Merkur Strasse Hottingen, Zurich, Switzerland.

My invention for improvements in apparatus for coating photographic dry plates and other plane surfaces with an emulsion or viscous liquid, has for its objects to deliver the liquid at a uniform rate, to vary the rate of delivery of the liquid according to the size of the surface to be coated or to the desired thickness of the coat, to distribute the liquid in a regular stream of the width of the surface to be coated, to construct the surface down which the liquid flows on to the surface to be coated, so that it readily adjusts itself to the different thicknesses of the articles whose surfaces are to be coated, and to provide means for traversing the surfaces to be coated at a regular speed and in a horizontal plane past the coating apparatus until the liquid has set, and for cooling the plates in order to set the coating liquid.

The liquid is delivered at a regular rate from a holder placed at a suitable height above an overflow trough by means of one or more bent tubes or syphons into the trough. The delivery orifices of the tubes are arranged in a horizontal plane immediately above the trough. The holder is made broad and shallow, and is raised to such a height that the differences in the level of the liquid in the holder do not materially affect the pressure, and consequently the regularity of the flow. Where greater accuracy is desired these differences in level are compensated for by making the delivery tubes partially or wholly of india-rubber, and altering the height of the holder; or preferably by employing a closed bottle provided with a delivery or syphon tube, and an air tube extending into the bottle to near its bottom, so that the liquid is deliverd under a constant head equal to the vertical distance between the lower end of the air tube and the exit orifice of the delivery tube.

The rate of delivery of the liquid is varied by means of a graduated tap in each of the delivery tubes, or by altering the height of the holder in relation to the exit orifices of the delivery tubes, or by adjusting the air tube of the closed bottle, or by a combination of these methods, or the ends of the delivery tubes are drawn out, and the quantity of liquid which each nozzle delivers per unit of time when the holder is fixed at the height indicated is marked upon a fixed vertical scale at convenient distances apart. The holder is raised and lowered by means of a rack and pinion, or other equivalent mechanical arrangement, and its height regulated according to the desired delivery of the liquid. The flow of liquid is stopped by means of a tap or clip applied to the delivery tube or tubes.

The delivery trough, by means of which the liquid is delivered in a uniform stream of the width of the surface to be coated, is provided with an overflow lip, and is divided by a partition extending nearly to the bottom into two divisions. The liquid flows from the holder into one division, and underneath the partition into the other or second division, where it assumes a perfectly level surface. The liquid is painted by means of a small brush over that portion of the lip which is immediately above the plate to be coated, and overflows only over that painted portion, and falls upon the plate in a uniform stream. The form of the trough can of course be varied, but in order to obtain a uniform distribution of liquid, the lip over and down which it flows must be formed of surfaces including obtuse angles only. Where the liquid overflows over a horizontal surface instead of over an edge a better overflow is obtained, and this form possesses the additional advantage that the trough can be very accurately adjusted and levelled. The partition of the overflow trough runs in grooves, and can be removed in order to clean the trough. The trough is fixed to the coating table and levelled by means of screws.

In order to adjust the surface down which the liquid flows to the different thicknesses of the articles whose surfaces are to be coated, the liquid is arranged to flow over a curved movable piece hinged to the trough at some distance back in the direction in which the surfaces move. The curved piece may rest directly upon the surfaces, or be separated therefrom by short wires, and is of any suitable shape containing only obtuse angles. It is so constructed that in its vertical motion it remains in easy contact with the front edge of the trough throughout its whole length, and is bent or curved backwards at the bottom. Its back portion is only slightly inclined to the horizontal in order that when a thicker plate succeeds a thinner one, the upward motion of the piece is very slow. Where large plates have to be coated it is with advantage made jointed at one or more points.

The surfaces to be coated are traversed past the coating apparatus, and the liquid afterward set by supporting them in a long trough upon drums or rollers floating on water or other liquid in the trough, and free to rise, and fall, and to rotate, but all motion in the direction of traverse of the plates is prevented. The drums or rollers are covered with cloth or felt to absorb the cold liquid in the trough, and apply it to the backs of the articles whose surfaces are being coated; or the articles may lie upon a traversing and stretched endless band, the underneath portion of which is either immersed in the cold liquid, or passes underneath the trough containing the liquid; and the upper portion of which is supported at a constant level, and kept constantly wet by means of the rotating drums or rollers already referred to. It will be evident that this arrangement will serve the double purpose of a levelling table and a cooling apparatus.

The inventor makes five claims.

7,747. *May 9th*, 1889.—"Rendering Cardboard Impervious to the Action of Photographic Chemicals." WILLIAM FRIESE GREENE, Photographer, of 92, Piccadilly, London.

This invention relates to a new or improved process and means for rendering cardboard and the like innocuous as regards any action on, and suitable as a basis to or upon which any suitable sensitising medium with which it may be desired to coat the same may be directly applied, and innocuous as regards any action on and impervious to the action of photographic developing chemicals or solutions, and suitable for photographic purposes, as hereinafter referred to.

The special object of the invention is so to prepare ordinary commercial cards, such as those whereon photographic prints as ordinarily produced on sensitised paper are at present mounted, as to enable the same to be sensitised with mediums suitable for the production of permanent photographic prints of the highest excellence and artistic value, so as to enable such prints to be produced directly on such cards, so as to avoid the tedious process of mounting and the subsequent process of rolling the prints, whereby the cost, time, and labour required for the production of such prints will be materially lessened.

Cardboard, and such cards and the like as ordinarily manufactured and without suitable preparation, such as that contemplated by the present improvements, is or are not suitable for the reception of such sensitising mediums, or for the production directly thereon of such prints, on account of the absorbency thereof, and of the chemicals or ingredients used in the manufacture thereof and contained therein, and of the liability of such chemicals to effect a deleterious action on such mediums if applied thereto directly, and on developing solutions and on prints if obtained thereon directly, causing such mediums to become unreliable and such prints to become discoloured and to fade and to be quickly destroyed so far as the artistic merit or value thereof is concerned.

To avoid all such disadvantages, and to obtain the aforesaid object and the important advantages attendant thereon, I cause, in accordance with the present improvements, the cards or the like to be subjected to a process or treatment which will be effective in rendering the same innocuous as regards any action on, and suitable as a basis to or upon which any suitable sensitising medium with which it may be desired to coat the same may be directly applied, and innocuous as regards any action on and impervious to the action of photographic developing solutions, so as to render the same suitable for the printing directly thereon of any desired photographic representation, either by exposure under any suitable negative to daylight, or artificial light, or in the camera or otherwise, in any ordinary manner of obtaining photographic prints or representations.

I attain such objects firstly, by destroying all organic matter at the surface of the card which would be deleterious to sensitising mediums or to developing solutions, and, as it were, parchmentising the surface of the card, and rendering it specially suitable for the subsequent operation hereinafter described, and this is effected by dipping the card into or otherwise subjecting it to the action of a mixture of about two measures of strong sulphuric acid and about one measure of water, subjecting it to such treatment for a time dependent upon the quality of the card, after which I thoroughly wash the card to free it from all acid, and dry it.

I then render the card or the like impervious to the action of developing solutions and otherwise suitable as aforesaid for photographic purposes, by brushing or otherwise coating the card by hand or by suitable mechanical means once or more times, according to the relative fineness of the texture of the surface of the card, and according as to whether a dull, or matt, or a glossy surface is required, with a mixture prepared by gradually pouring about three parts by weight of spirits of turpentine into about one part by weight of zinc oxide, stirring the mixture the whole while, and by gradually adding to such mixture about one part by weight of pale gold size, continuing the stirring all the while, and for a sufficient time subsequently to ensure homogenity in the product.

All such operations should be conducted in perfectly clean containers, preferably formed of glass, and with glass stirring rods, and they may be conducted at ordinary atmospheric temperatures.

After being thus coated the card is dried, and will be suitable as aforesaid as a basis to or upon which any suitable sensitising medium may be applied directly, and it will keep suitable for such use so long as it is kept free from the access of dust and under appropriate conditions, and after being sensitised it should also be kept until required for use under usual appropriate conditions; and may then be used and treated as if it were ordinary sensitised paper, but will possess the advantage of dispensing with the operations of mounting and rolling and of consequently effecting a material saving in the cost, time, and labour involved in the production of the required prints.

If the cardboard or the like is of a sufficiently good quality as to be innocuous as regards any action on sensitising mediums or developing solutions, then the aforesaid preliminary operation may be dispensed with, it then only being necessary to render the same impervious to the action of the developing chemicals and solutions as set forth.

If any particular colour of card be required, there may be added to the zinc oxide, before the admixture therewith of the spirits of turpentine, any suitable colouring matter innocuous as regards any action on sensitising mediums or developing solutions.

The inventor makes ten claims.

10,930. *July 6th*, 1889.—"Photographic Objectives." Dr. RUDOLPH KRUGENER, Bockenheim, Germany.

The objectives heretofore used in photography consist almost exclusively of two halves or parts, each of these halves or parts being made of two lenses (crown glass and flint glass) which are cemented together.

The progress made in the science of photography during the last few years has considerably increased the requirements with regard to optical apparatus, whilst by the momentous undertaking of the Glastechnische Laboratorium at Jena, the calculator or the designer of optical apparatus has had placed at his disposal kinds of glass enabling conditions to be fulfilled which were formerly altogether unknown.

In photographic objectives the aforesaid conditions bear more especially upon the evenness and lightness in focal depth of the picture on the plate, as regards the arrangements of the spherical surfaces.

The present invention is the result of a research which has been carried out with much labour spent in calculations, and in which many modifications have been taken into consideration.

In this research it has been found that the circumstances are most favourable if the front part or system is made of a single flint-glass lens of positive focal length, whilst the rear part of system, which may be composed in any desired manner, annuls the faults caused by the flint lens in front, and, together with the former part or system produces a picture which is planatically and chromatically correct.

As an example may serve an aplanatic device in which the rear part or system consists of a negative flint glass lens cemented to a positive crown glass lens.

The constants of the same for the following kinds of glass are :—

n D = 1·506 crown.
n D = 1·583 flint.
R 1. 43·25 + } front lens, flint glass.
R 2. 78·69 — } central thickness, 6·19 millimetres.
Longest distance between the front lens and rear lens = 8·26.
R 3. 76·89 } rear lens, flint glass.
R 4. 22·56 } central thickness, 1·34 millimetres.
R 5. 22·56 + } crown.
R 6. 50·74 + } central thickness, 19·38.

n designating the index of refraction of the glass.
D the spectroscopic line.
R R, &c., the several radii of the lenses.

The system has a free opening of 33 millimetres, and a focal length of about 200 millimetres.

In the present case + signifies convex and — concave.

The herein described improvements in photographic double objectives in which use is made of a simple flint-glass lens of positive focal length, for the purpose of concentrating in the plate picture a larger quantity of light with a considerable focal depth.

Correspondence.

SPHERICAL ABERRATION AND FOCUSSING.

Sir,—Your correspondent, Professor W. K. Burton, has fallen into an error in describing the position of best visual definition when positive spherical aberration is produced in a lens. I have before now pointed out that the position of best definition is not that of the least circle of aberration, but *beyond* it, and not nearer to the lens, as stated by Professor Burton. Referring to fig. 2, reproduced in your last issue, the best definition *will lie beyond* i_1, and not between I and i_1.

The image-forming rays are those near the axis, and are clustered very nearly in one point for an aperture up to *f*/15 in *ordinary* landscape lenses; beyond this aperture the rays, as they approach the edge of a non-aplanatic lens or system, become rapidly refracted towards the lens without concentration on the axis, and introduce round the more or less definite image the "halo" referred to. The greater the amount of spherical aberration in a lens, the greater is the measurement of the locus of partial definition; and if the locus of longitudinal aberration is much or little, common sense alone must show that that partial definition is a *fact* within the limits of that locus, and settle the "much-vexed question."

In ordinary landscape lenses it is *not* necessary to readjust the focus if the aperture be *opened up* and spherical aberration introduced; but in the portrait lens, by removing the flint element in the back combination slightly from the converging crown, the *focus alters*, and therefore it *is* necessary in this case to readjust the focus. Thomas R. Dallmeyer.

25, *Newman Street*, W., *8th July*, 1890.

WEIGHTS AND MEASURES AT THE PHOTOGRAPHIC CONVENTION.

Sir, —The last issue of your valuable paper was anxiously looked for in order to read the news from Chester, knowing that among other important questions submitted to the Convention, was the report of a Committee on Weights, Measures, and Formulæ.

The able Secretary of the Committee, with his usual lucidity, described in the preamble the superiority and convenience of the metric system, and to increase its value by strong contrast, explained also the negative beauty of the English system. From this portion of the report we learn (what was not generally known), that the apothecaries' ounce of 480 grains, after all, is not legal, and that the legal one of 437·5 grains is divided into 480 parts, which greatly increases the already inextricable chaos.

Arrived at this point of the report we exclaimed, "Bravo Convention! that is a good blow at that horrible system!" But alas! our joy was of short duration. The commission, according to the report, after informing us that "the metric system is *exclusively* used for scientific purpose," declares that photographers are not intelligent enough to understand it; they require long education before they will be able to use it.

Throwing this gratuitous insult at the heads of thousands who, with good reason, consider themselves fully competent to use the methods of their brothers occupied with other branches of science, the commission then commits an error in proposing a modification of the condemned system—and what a modification!

Till now we had to deal with a bad system, but with one only. The Convention imposes on us two—the metric and a modified one—in which ounces and grains differ from the old ones (they are divided into decimal parts), forgetting that "photographers do not possess the knowledge of decimals sufficient to enable a decimal system to be used easily and accurately."

Scarcely twelve months have elapsed since the Photographic Club passed a resolution that the metric system, *pure* and *simple*, should be adopted by photographers. The communication sent to other societies inviting them to co-operate in view of the general introduction of the system was sympathetically received.

Why put obstruction in the path of the useful progress of our art by introducing another bad system, and thereby increasing the chaos? No doubt we have arrived at the conclusion that the existing system of weights and measures is so bad that we cannot use it any longer. It is also known that the metric system is good, is already introduced all over the world, and even adopted by scientists in this country. Let us adopt it too. By doing this we shall secure uniformity in our expressions and simplicity in our calculations. Let us protest against the insinuation that we are too ignorant to understand decimals, and less intelligent than the mass of the population of Germany, and the inhabitants of the Balkan Peninsula, and other countries of the world, who, two months after the introduction of the metric system, became thoroughly conversant with it. L. Warnerke.

Silverhowe, Champion Hill, London, S.E.

NEW GELATINE FILMS.

Sir,—In your article on the "New Gelatine Films" you speak of "Obernetter's Films." This is, so far, correct, as the films are coated with the well-known Obernetter emulsion. The support, however—that is, the films proper—are entirely the make of Otto Perutz, of Munich, who also does the coating both of plates and films with the said emulsion.

J. R. Gotz.

19, *Buckingham Street, Strand, London, July 9th*, 1890.

Proceedings of Societies.

London and Provincial Photographic Association.

The annual meeting was held at Masons' Hall Tavern, Thursday, July 3rd, Mr G. W. Atkins in the chair. The chairman called upon the hon. sec. to present the annual report, which ran as follows:—

"In presenting the eighth annual report, your committee is pleased to be able to congratulate the members on the work done by the Association during the past year. The general meetings have been fairly well attended, and the discussions have been interesting and well supported. In accordance with a suggestion made in the last report, your committee recommended the giving of lecturettes and demonstrations monthly. These have been very successful, and the best thanks of the committee and members are due to those gentlemen who have given them. Among the most interesting subjects introduced on these special evenings should be mentioned:—"Glass Blowing as Used in our Chemical and Physical Laboratories," A. Haddon; "The Action of Ferricyanide of Potassium on Developed Plates," P. Everett; "Selecting Focal Distance with Detective Cameras," W. E. Debenham; "Etching on Glass," A. Haddon; and "The Ethics of Photography and Photographers," J. Traill Taylor." The lantern meetings have been well supported, and the competitions in connection with slide making, silver and platinum printing and developing have been productive of much pleasure and beneficial discussion. Monthly out-door meetings have been again recently introduced, and bid fair to be very popular with those members who have Saturday afternoons at liberty. There have been a few resignations from various causes, and your committee regrets to have to record the death of Mr. J. T. Collins, who had been a member since 1884, and was for some time a member of the committee. In thanking all those who have in any way helped the success of the meetings of the Association during the past year, your committee would specially urge the desirability of increasing the number of members. The amount of subscription is very small (only 5s. per annum), and it is only by keeping up the number of members that the Association can be made to pay expenses. Finally, the financial condition of the Association (as will be seen on presentation of the balance sheet) is thoroughly satisfactory. All accounts and liabilities have been paid, and there is a balance in hand."

The balance sheet was then read, and, with the report, adopted.

The election of officers for the ensuing year was then proceeded with. The result of the ballot was as follows:—

Trustees—Messrs. J. Traill Taylor and Mr. J. B. B. Wel-

lington ; *Curator*—Mr. A. Haddon ; *Committee*—Messrs. H. D. Atkinson, F. A. Bridge, J. J. Briginshaw ; F. P. Cembrano, E. Clifton, W. E. Debenham, T. E. Freshwater, F. S. Pask ; *Hon. Sec. and Treasurer*—Mr. R. P. Drage.

Mr. P. EVERETT proposed, "That a special vote of thanks be given to the retiring hon. sec. and treasurer, Mr. F. A. Bridge, for the efficient way in which he had carried out his duties." This was seconded by Mr. A. Cowan, and carried by acclamation.

Mr. F. A. BRIDGE briefly responded, thanking the members for their good feeling, and regretted that the limited time at his disposal had necessitated his resigning the secretaryship.

A vote of thanks to the other officers was proposed by Mr. W. H. Harrison, seconded by Mr. A. Cowan, and carried unanimously. Mr. W. E. Debenham responded.

The Saturday outing was fixed for Wanstead Park, July 12th. Trains from Liverpool Street to Ilford at 2·17.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

A SPECIAL meeting was held at the Masonic Hall on the evening of July 8th, Mr. B. J. TAYLOR in the chair, when Mr. SMITH, the representative of the Eastman Company, gave a lecture and demonstration on their latest Kodak hand-camera, and their new films, after which he developed some film negatives exposed during the day at Chesterfield, which all came out splendidly.

The SECRETARY announced an invitation from the Rotherham Society to join their excursion to Haddon Hall on the 17th inst.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of the council of this society was held on Wednesday, July 2nd, at 58, Pall Mall, the Right Hon. the Lord DE ROS in the chair. H.R.H. the Duke of Cambridge was elected a vice-president, and Mr A. Newton Melhuish was, on the proposition of Mr. Glaisher, appointed assistant-secretary.

Mr. ARTHUR JAMES MELHUISH, the hon. secretary, then laid before the council the pictures for the current year, which had been arranged and classified by Mr. Glaisher. After a careful examination, they were pronounced by the council to be far in advance of any previously received. They were arranged in four classes. The first class comprised 128 pictures. The following prizes were awarded :—To R. O. Milne, the first prize, a large silver goblet ; to F. S. Schwabe, a silver goblet ; to W. Vanner, an oil painting in frame by McEvoy ; to R. Murray, a handsome portrait album with silver plate ; a handsome portrait album to F. Griffith, W. S. Hobson, and F. Wrigley ; to the Vicomte de Condeica, a large silver medal ; to Dr. Drew, W. Gaddum, Miss J. Wilson, Miss Mahon, J. C. Cohen, Rev. G. J. Perrain, F. G. Smart, General Kaye, and R. Leventhorpe, a medal each ; to H. O. Hutchinson, a picture in frame ; to M. De Dêchy, a portrait album.

A vote of thanks was given to Mr. Glaisher for the time and attention he had bestowed on the arrangement and classification of the pictures.

THE SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held at the Masonic Hall on Tuesday evening, July 1st, Mr. B. J. TAYLOR in the chair.

After the routine business of the meeting, prints were shown by the president, secretary, and Mr. Crowder of views taken at the recent excursion to Bolton Abbey.

Mr. E. BECK then read a humorous paper on "Bolton," written by one of the members.

It was arranged that the Society should purchase three American stereoscopes for use at the meetings, as many of the members now take stereoscopic views ; and arrangements were made for a half-day excursion to Ashopton and Derwent Hall on July 19th.

THE HOLBORN CAMERA CLUB.

THE usual weekly meeting was held at the headquarters of the Club, 100, High Holborn, on July 4th, when a lecture on "Developers and Development" was delivered by Mr. A. Jones, and a discussion followed, which was joined in by Messrs. Smith, Bayston, and Dear.

Answers to Correspondents.

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

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

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

W. H. M. (Stoke-on-Trent.)—*Photo-Etching Process.* The bitumen process is more easily worked on zinc plates than upon copper, and the etching with ferric chloride solution does not then present so much difficulty, half-tones being more readily obtained.

CASTILE.—*Astronomical Photography.* Eclipse phenomena, spots on the sun, the phases of the moon, the occultation of planets with their satellites, may be enumerated as some of the more important applications of photography. To these may be added the splendid results of Mr. Isaac Roberts in mapping the starry heavens, and representation of the nebulæ. Colour photography seems as far off as ever, but even if realised, it remains to be seen how this will help the main problems of astronomical science.

W. M. (Mainz).—Received, and answered by post.

E. G. S.—*Selection of Lenses.* The rapid rectilinear ought to do most of your work. Try the front lens of your portrait combination, reversed and suitably stopped down, before procuring another landscape lens.

IN TROUBLE.—*Ancient Lights.* You are not the only sufferer. This is often a very serious question for the professional photographer, and you should at once consult your solicitor. If we rightly understand you, there was a chimney stack before, but it has recently been raised in height, so as to obscure much of your available light. Did you make a representation whilst the work was in progress ?

J. P.—*Wooden Washing Trays.* Lance wood, sycamore, and alder are said to be very close-grained woods, but this quality is not all-important provided they be well coated with shellac varnish, or basted with melted paraffin. For the glass bottom, mixed red and white lead makes a better joint than ordinary glaziers' putty.

B. J. L.—*Actinometer.* We have referred to the patent of a year ago, but fail to see any element of novelty. It is based on the assumption that ordinary silver sensitised papers are always of uniform rapidity, which is questionable.

VEILED.—*Ferrous Oxalate Development.* The whitish deposit you complain of may be only a thin layer of oxalate of lime, in which case a short immersion in very dilute hydrochloric acid ought to remove it.

S. W.—*Perished Rubber.* We are not aware of any use to which you can put it. The best plan would be to offer it cheap to some india-rubber manufacturer.

F. I. C.—*Weights and Measures.* The case is well put in the Convention Report (see page 523 of last week). The nine recommendations ought to meet with universal acceptance, and it is immaterial whether French or English measures be adopted, so long as the decimal system is adhered to.

M. G. (Preston).—*Sulphate of Silver.* Your proposal to add free sulphuric acid to the silver sensitising bath is open to the objection that the comparatively insoluble sulphate of silver would be formed, and this is not affected by light. The employment of citric or acetic acid would certainly be preferable.

N. READ.—*Isochromatic Patents, &c.* The specifications are numbered A.D. 1883, No. 101 ; A.D. 1886, Nos. 7,963 and 15,532. Rhodamine is procurable at the Atlas Dye Works, Hackney Wick, N.E. Its use is not covered by patent.

J. W. (Leeds).—Wishes to know the formula for developing Seed plates (American). Can any of our correspondents oblige us with the information ?

J. A. C.—*Sensitometer.* Mr. A. Watkins has recently described a new exposure meter depending upon the use of a bromide paper sensitised with nitrite of soda. This was shown at the Hereford Society, and likewise at the meeting of the Camera Club on May 22nd last.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1663.—*July* 18, 1890.

CONTENTS.

THE METRIC SYSTEM IN PHOTOGRAPHY.

WHILE two such champions as Mr. Warnerke and Mr. Bothamley are in tournament in our correspondence columns about the introduction of the metric system of weights and measures among English photographers, far be it from us to interfere while the case is *sub judice* before the court of public opinion; but some use may be served by introducing a new element into the case which may tend to accentuate or to calm the strife. Washington Irving told a story, setting forth how, in an early American hall of legislation, a hole was found in the wall of the Parliament House, admitting the winds of heaven, and making certain law-givers more stiff-necked than they were before. Week after week was passed in discussing the question to what department of the executive staff of the government fell the lot of repairing the hole in the wall, until one fine morning a member, out of his private purse, gave a bricklayer a dollar or other sum to block up the hole, and when the members assembled the following evening to resume the heated debate the bone of contention was found to have disappeared.

By analagous line of action, we venture to offer a possible practical explanation of a chief reason why British photographers have been slow to adopt the metric system, namely, that being convinced by the utterances of the Convention and of other photographic bodies that they ought to take the system up, they found in looking through most photographic dealers' catalogues, that the said weights and measures were not on sale by the firms from which they ordered their ordinary photographic goods, except, perhaps, in the instance of a small minority; moreover, upon calling upon the said dealers, it may have been found that they had no more of such weights and measures in their stocks than they had in their catalogues. The idea, in short, is, that the unfamiliar weights and measures are less readily obtainable than might be the case, and that many photographers do not take the trouble to get them from special sources. This simple explanation may reveal what has more to do with the matter than the alleged influences mentioned in the Convention report; if so, dealers have much influence in the matter.

All over France, the metric weights, from a gramme upwards, to such a height as photographers are likely to require when making up small quantities of developer, are sold for ordinary trade purposes, sticking something like cribbage pegs into a little bit of wood, and are easier to handle than the flat, small weights in ordinary use here.

The metric system, which has spread all over civilized Europe, and into the scientific section of English society, had its origin in the French Revolution, which the recent Exhibition in Paris was established to celebrate. The ambitious French philosophers then discarded arbitrary standards, and on first principles laid down standards for the whole world, taking a portion of the meridian of the earth as their unit of measurement. The ten-millionth part of a quarter of the earth's meridian is the unit from which all the other measurements are made, and this unit is called a metre; it is 39·371 inches, or a little more than our yard; one-hundredth of the metre is a centimetre. A cubic centimetre of distilled water at its maximum density—39·5° F.—is the unit of weights, and called a gramme. This gramme in English weight is about 15½ grains, and it is just as easy to mix a developer by so many grammes of each ingredient as it is to mix a developer by so many scruples of each ingredient—an intellectual feat which, in our humble opinion, the English photographer is capable of achieving, especially when aided by weights which he can handle more readily than those which he had previously used.

Yesterday afternoon, after the preceding lines were written, we opportunely received a new catalogue from "The Blackfriars Photographic and Sensitising Co." in which are quoted "Decimal weights for photographic use, as proposed by the various societies," but in the index we can find nothing about measuring-glasses on the same system.

ABOUT WEATHER FORECASTS.

THE state of the weather is of so much importance to those who depend upon light as the first necessary for their daily work, that the question whether or not our Meteorological Office is able to give us reliable advice as to what the morrow may bring forth in the way of sunshine or rain is to them a very serious one. For some years past weather forecasts have formed a notable feature of our daily newspapers, and in the *Times* and some of the other papers we have placed before us, in addition to the forecasts, a small map or chart of the British Islands and the countries contiguous thereto, marked with certain curved dotted lines, with arrows pointing in different directions, and with other hieroglyphics to which certain meanings are attached. The curved lines are "isobars," or lines of equal barometrical pressure, and the figure at the termination of each gives its value. The arrows show the direction of the wind in the particular locality where they fly, and the number of barbs upon the messenger denotes the strength of the breeze. In addition to this information we are also given the temperature at various stations all over the area covered by the chart, and a knowledge of the state of the sea, that is, whether it be rough, smooth, or in a state of calm. It is from a study of this chart, coupled with a knowledge of the actual state of the weather at various stations on a given day, that the Meteorological Office is enabled to indicate the kind of weather which may be reasonably looked for during the next twenty-four hours.

The isobars of the chart represent the most important feature of it so far as weather forecasting is concerned, for all such predictions are founded upon barometrical readings. This will at first seem difficult to believe, for we have all had experience of household barometers, and know full well that often when it points to "set fair," the weather outside is rainy, and *vice versâ*. Hope never yet told such flattering tales as these barometers do with regard to fair weather when all is foul. But we must not be too hasty in blaming a valuable instrument, when we should rather blame the maker for attaching to it words which are altogether useless and misleading. In one sense the barometer may be said to have come before its time, for its value could never be fully appreciated before it was possible, as it is now, to compare its readings at a given moment over a large area. This is done daily by means of the electric telegraph, and on the faith of the messages so received by the Meteorological Office, the charts and forecasts are prepared.

In order to give a general outline of the manner in which this is accomplished, it will be necessary to point out that the curved lines, or isobars, represent parts of two great barometrical systems, and that one is known as a "cyclone," and the other as an "anti-cyclone." The first may be regarded as indicative of bad weather, for it is usually accompanied by rain or snow, according to season, and by leaden skies and gusty wind. Its centre is marked by an area of low pressure, and the rotatory movement of the winds round about it are in a direction contrary to the hands of a watch. The anti-cyclone is the reverse of all these things. Light breezes circulate round a high pressure centre, and we have those bright, balmy days so valued by good people in general, and photographers in particular. It is the relation which exists between these two systems, which travel slowly or quickly over the face of our part of the globe, which enables the weather forecasts to be tabulated. It is true that they are very often wrong, but experience shows that, in the aggregate, they are correct to the extent of about 66 per cent.; or, to put it in other words, two forecasts out of three are borne out by the weather which afterwards comes to us. There are many difficulties in the way of making reliable forecasts, and the chief one is due to our insular position. Most of the cyclones which bring us such bad weather travel across our country from west to east, and therefore find their origin in the Atlantic ocean. How they are formed no one can say; all we know is that they are due, like all other atmospheric phenomena, to solar radiation. If it were possible to dot signal stations at distances of a few hundred miles all over the great western ocean, and to place them all in electrical communication with London, the forecasts would become far more reliable than they are now, and the idea of establishing at least one such station in mid-ocean has more than once been ventilated. The difficulties in the way of such an enterprise may, however, be looked upon as insuperable.

Some months ago a correspondent of the *Times* wrote a very amusing letter to that journal on the subject before us, and while he admitted that the "clerk of the weather"—*i.e.*, the Meteorological Office—was correct in his forecastings to the extent which we have already stated, he more than hinted that it was all guess work, and that the money which it cost could be more profitably applied. He based his strictures on certain experiments which he had made, which were certainly ingenious, but hardly scientific. In the first case he pasted each published forecast for one summer month on a separate piece of card, placed them all in a bag, shook them up, and on each day of the following month he took out a card and compared it with the state of the weather which prevailed at the time. He says that, so far as results went, it was a neck and neck race with the clerk of the weather, but the latter won by a short length. By which he meant that by this "lucky bag" system his forecasts were correct in almost as many instances as those published by authority. In another case he tried the system of forecasting for the morrow by adopting the weather record for the previous day at sunset, and this plan he also found to be moderately correct. Upon these data he founds his belief that the present system of weather prediction is as amusing as a game of pitch and toss by reason of its uncertainty.

We do not agree with this writer. The official observations are taken with great care, and are founded upon a scientific basis, and although it is common for

some persons to laugh at anything which they cannot readily understand, particularly if its imperfections are manifest, the thoughtful will feel glad that some steps have been taken towards the solution of a very difficult problem. Because the predictions are wrong once out of three, it does not follow that they always will be so. A child crawls with difficulty before it can walk upright, yet no one is so foolish as to scold it for incapacity.

READY-SENSITISED PAPER WORKS.

A New Hygrometer.

Mr. Otto Scholzig having kindly sent us an invitation to inspect his works at Stockwell Green, London, now established six years, and wherein he prepares ready-sensitised papers for the market, the following particulars may be of interest. There are four sensitising rooms on the premises, each containing thirteen large baths, on which girls float the sheets; each sheet, when taken off its bath, is put between blotting-papers, or rather blotting-boards—for they are exceedingly thick—then "mangled" through the wall into the adjoining drying room; the object of the rolling is to remove all superfluous liquid. The blotters are used over and over again, to the extent of thirty or forty times; they are then burnt, and the ashes containing the waste silver are saved for reduction. There is a reducing furnace on the premises, and the silver thus recovered is sold to refiners, as it is not remunerative to make one's own nitrate salt of that metal. The metal thus obtained is, on an average, 17½ dwts. per ounce purer than standard silver, or but ½ dwt. per ounce less than pure silver. The crucibles are of such capacity as to produce a lump of about 16 lbs. weight of metal. Mr. Scholzig says that he cannot account for it, but it is a fact that the chloride of sodium forming most of the soluble residue in the reducing pots is better than ordinary table salt for precipitating the silver from old baths; it throws the chloride down more quickly, and leaves the liquid in brighter condition.

The drying room is at a relative humidity of less than 55 per cent., and this is regulated by varying the temperature and ventilation of the room. Girls hang the sheets over wooden rods to dry; after the drying each sheet is brushed with a pad of green baize to remove any fluff, and the sheets are afterwards packed ready for sale.

As Mr. Scholzig naturally will not furnish the formula of the sensitising solution he employs, we turn to the next leading feature in the works of interest to the public, namely, a new hygrometer.

An important point in drying ready-sensitised paper is that it shall not be dried too much, which would give it a horny character; hence the warm drying room has to be kept at a particular degree of humidity. This end is attained by means of a new hygrometer invented by Dr. C. Koppe, made by Usteri-Reinacher, of Zurich, and in use by order of the Government at certain Swiss meteorological observatories. Mr. Scholzig prefers it to the wet and dry bulb instrument, for it indicates exactly what percentage of aqueous vapour is present in the air. In ceramic photography by the dusting process, a good hygrometer is useful for the obtaining of uniform results, and the instrument is of value in other departments of photography, so a description of the new one may be of interest. It consists of a frame to which one end of a human hair, carefully freed from grease, is fixed; the other end of the hair is wound round one groove of a pulley wheel with two grooves. Round the second groove a filament of silk is wound in a reverse direction to that of the hair, and at the lower end of the hanging silk filament a little weight is attached, so that the hair is kept constantly under tension. An index needle attached to the wheel in front of a scale of 90°, divided into 100 parts, shows the amount of any elongation or contraction of the hair. When the hair grows drier the needle turns to the left, and when the hair grows more damp the needle turns to the right. When the surrounding air is completely saturated with water the needle points to 100 on the scale.

To use the instrument, a little sliding frame covered with muslin is soaked in water, then put in position at the rear of the little case, the front of which is then closed by a sheet of glass. In a short time the air in the case becomes saturated with water, and the needle travels nearly to 100; then by turning a key it is regulated by being brought exactly to 100. The instrument should be tapped a little every now and then when regulating it, in order to overcome any inertia.

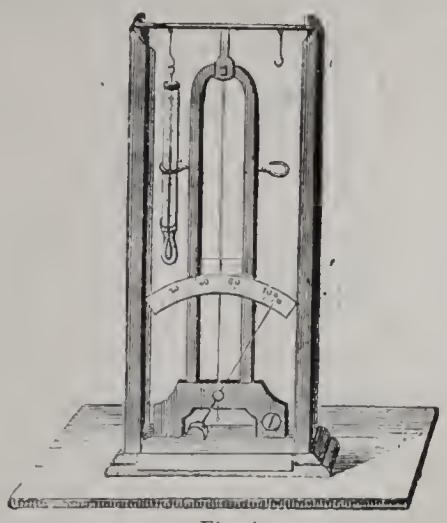


Fig. 1.

A metal back behind the muslin frame prevents the escape of moisture. When the air in the case is saturated with water, the metal back, the muslin, and the glass are removed; the hair then begins to dry so far as the air in the room will permit it to do so; the index needle turns as the hair grows drier, and when the needle comes to rest it indicates the relative humidity of the apartment or locality in which the hygrometer is placed.

If drops of water have formed at the bottom of the hygrometer, they should be wiped off before taking the reading. In order that the hair may sustain no damage when subjected to transport, its tension is taken

off, the needle is guided to the left extremity of the frame, and there fixed by means of a little hook. The small weight is then pushed under a spring which holds it tight against the middle of the frame.

By the aid of the diagram, fig. 2, it is easy to ascer-

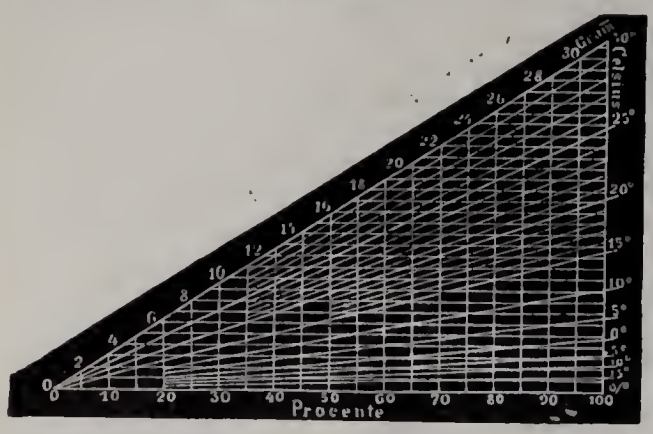


Fig. 2.

tain without calculation the absolute humidity and the condensing point of the aqueous vapour, by observing at the same time the temperature of the air. For instance:—

Indication of the hygrometer ...	... 65 per cent.
Thermometer	... 10° Cent.

The observer then follows the horizontal line upon the diagram till he reaches the point where the two lines 65 and 10 cross each other, and finds at the left side six grammes marked; this means that a cubic metre of the air under observation contains six grammes of vapour of water. Upon following the same line to the right, the condensing point 3° is found; that is to say, the air may be cooled from 10° to 3°, or seven degrees, before the moisture in it begins to condense. For example:—

Hygrometer indication ...	... 65 per cent.
Thermometer	... 25° Centigrade
Absolute humidity	... 15·3 grammes
Condensing point	... 18° Centigrade

Whilst in the first case the air only contained six grammes of vapour with relatively equal humidity, in the second case this quantity of vapour of water increased to fifteen grammes, because the temperature was higher. The higher the temperature of the air, the greater is its power of absorbing vapour of water.

AN Australian photographer has recently made up an album containing 700 portraits of the pioneer colonists of Victoria, reproduced from original photographs or paintings by photo-mechanical means.

PHOTOGRAPHIC TERMINOLOGY IN AMERICA.—A new science brings with it new words, and if one language is too weak to supply them they must be taken from another language. Photographers who use a preliminary bath before developing a plate are adopting the word "Vorbad," from the German "vor," meaning "before," and "bad," meaning "bath." The photographic journals were all prompt in accepting the word, never for a moment considering that a noun like "prelavation," a Latin derivative, would answer just as well or better. The word which we suggest means a preliminary bath, being derived from the Latin *præ lavare*, to wash or bathe beforehand, or rather from *præ*, beforehand, and *lavatio*, a bath or washing.—*Photographic Globe.*

THE PROGRESS OF THE PHOTO-MECHANICAL PRINTING PROCESSES.

BY HERMANN E. GUNTHER.

No. III.

AFTER the asphalt powder has been gathered on the white paper, it is moistened, and, on a glass plate, rubbed down finely by the aid of a rubber, which manipulation is repeated several times, the powder being dried each time.

The finely-powdered asphalt is now placed in the dusting-box, which may be made either revolving on an axis, or stationary, and provided with a blast arrangement, but which, at all events, should have a sufficiently powerful moving force, so that the particles of the dust are thrown up to the cover of the box. R. Maschek uses a box about seven feet high and three and a-half feet wide, which, as he asserts, suffices for the coarse powder as well as for the fine one, for the reason that by the time which lapses between the whirling up of the dust and the introduction of the plate into the box, the size of the falling asphalt particles may be ascertained. Strips of sheet rubber should be nailed round the inside of the door of the box, so that it will shut up nearly hermetically.

After the asphalt has been placed in the box, the door is closed tightly, and the powder shaken up violently. After a lapse of a minute or two, if it be supposed that those asphalt particles are falling which are intended to be used in order to produce the required degree of granulation, the door is opened, and the previously thoroughly cleaned plate is placed therein, poised on the points of a few double-pointed nails driven into the base of the box, all being equal in height. The plate remains in the box until, if removed and held obliquely against the light, it shows a velvet-like appearance. In looking at it, only a shade, but better still, no plain copper at all, should be observed. Until this state is attained, about five to seven minutes will be required. The longer the plate remains in the box, the greater will be the quantity of powder deposited, and the finer will be the resulting granulation. The plate should be removed very carefully from the box to prevent any dislocation of the particles.

To melt the dusted-on asphalt powder, the plate is held with the reverse side in contact with the flame of a spirit lamp until the brown velvet-like tint of the asphalt has changed to a beautiful bluish-violet tone. It is then laid aside to cool down, and then placed for about one minute in a bath of vinegar, common salt, and water, until it becomes copper-coloured. After the plate has been rinsed in this bath it is ready for receiving the negative pigment impression, which can at once be squeezed on and developed with warm water in the ordinary way. As I have mentioned in the previous chapter, the etching of the copper plate is done with solutions of chloride of iron of different concentration. Previously, however, the edges and the reverse side of the plate must be coated with asphalt varnish, to prevent their being attacked by the etching solution.

The four dishes containing the solutions of different consistencies are now placed in a row, and at last a fifth one is added containing clear water. Dish No. 1 contains the strongest; dish No. 4 the weakest solution. Not too large a quantity of the etching fluid should be poured into the dishes, so that the picture is still distinctly visible through the solution. A plate-lifter is necessary to manipulate the copper plate easily in the solutions without handling it with the fingers. Kiewning uses a curved

rack of copper wire, which is also coated with asphalt varnish to render it indifferent to the etching fluid, and which is provided with two handles. Masehek recommends an arrangement consisting of six single bars, which can be screwed separately on either side of the plate. At the upper end of each bar there is a perforated tail, through which tie-rods can be passed and fixed by screws. This arrangement has the advantage that, in the case of large plates, these can be transferred from one bath into another one by two persons at the same time.

In the first etching bath the parts of the plate are attacked which are covered with the weakest film of gelatine, representing the deepest shadows; the second and third bath successively produce the gradations of the tones, while the fourth bath etches the light tones. The plate is then transferred to the water bath, and it is important that this be done at the very moment it is observed that the solution begins to attack the high lights. If this moment be allowed to pass, the parts of the plate which should be represented by plain copper, and which in printing should be entirely free from colour, will be slightly etched, consequently will retain the colour in the printing press. It is well to transfer a small quantity of the etching fluid from the fourth solution into the water bath together with the plate, so that a very dilute chloride of iron solution is produced, which completes the etching process.

When thoroughly washed the plate is taken out of the water bath; the gelatine is removed by means of a piece of soft linen, and the asphalt dust by aid of benzole. Also the cuprous chloride which has been formed during the etching process must be removed from the plate, and this is done by means of a mixture of spirit and ammonia to which some finely powdered chalk has been added.

Printing plates obtained by the above process will generally require retouching, though it should be applied only to a slight degree. It is achieved similarly to mezzotint engraving, the high lights being put in with a burnisher, and the shadows, if not deep enough, or if the grain has disappeared through the prolonged action of the etching fluid, are passed over with a "roulette," in order to give a bite for the printing colour.

If a large number of prints is to be taken from an etched copper plate, it is necessary to steel it previously. This is done by attaching it to the negative pole of an iron bath, and providing it, by the action of the galvanic current, with a fine coating of iron, which protects the plate against wear and tear. After the plate has been taken out of the galvanic bath, it is quickly washed with water, then with a solution of soda, when it is carefully wiped by means of a linen cloth, and rubbed in with some oil to prevent oxidation.

The Photographic Society of Great Britain.—Monthly technical meeting Tuesday, July 22nd, at 5A, Pall Mall East, at 8 p.m.

Conjugal Likeness.—It is a theory like another that by moral pressure you can change the shape of your nose; and a Genevese society (photographic) has succeeded in showing that the pressure aforesaid need be neither conscious nor direct. It has secured the likenesses of eight-and-seventy couples old in matrimony; has contrasted the same with the likenesses of eight-and-seventy pairs of brothers and sisters; and has come to the conclusion that the resemblance induced by the habit of association is stronger than the resemblance which is an effect of consanguinity. It is a pleasant result, and the developments of which it would seem to be susceptible are pleasant in likewise.—*The Scots Observer.*

EXPRESSION.

BY J. MEW.

It has been said that to write in defence of the claims of photography to be an art, is to admit it not to be an art. If this position were true, many writers are ill-sped, for it is difficult to meet with a single volume of any book dealing with photography without finding several pages written, well or ill, with the avowed intention of affirming and supporting this exact position. But it does not seem to be true that to defend the claims of photography to be an art is to to prove that it is not one. Could it, for example, be said truly that to defend the claims of the heliocentric system of our little world to correctness, is to demonstrate them to be incorrect? or that to maintain the sacred truths of our holy religion is to declare them to be false? Such a notion would, indeed, sadly distort and pervert the views hitherto held by the vulgar of such men as Paley and Butler, who have ever been regarded by the public at large as amongst the most doughty defenders of Christianity. These ecclesiastical champions, these Amadises of orthodoxy, would, by a parity of reasoning to that adduced to show photography to be not an art, be changed into fellow-labourers with Tom Paine and Denis Diderot, with Ingersoll and Voltaire.

Because the claim of photography to be an art has been disputed, does it follow that it must, of necessity, be disallowed? It is said that painting is an art because it has never laid claim to be one. But in the kind of painting known as pre-Raphaelite, which is, perhaps the nearest approach to photography, there seems to be about as much reason to question the existence of art as in the ordinary photograph. The painter may place his art in the region of imagination, a region to which the photographer has, as a photographer, but a straight and narrow path of access. The broad and wide field of truth in which the latter chiefly labours admits, on the contrary, somewhat unwillingly any approach to art or artifice. But painter and photographer may both be artists in the matter of expression.

From the first meaning of expression—squeezing out by pressure, as, for instance, the juice of a fruit—are derived the other two meanings, one of the utterance by the tongue, or the representation by words of mental emotion; the other, of the change which takes place in the face under the influence of feeling. The term expression has been also analogically applied to the grouping of figures and the character of a landscape, but with these the present article has nothing to do.

Expression, as used in the present paper, regards only the specific conformation of the human features. To take a homely and well-worn instance of photographic expression, it is only necessary to open an old photograph album. There confronting you, in the great majority of pictures, is the semblance of weary resignation and enforced repose commonly attributed to the use of that modern instrument of torture called the head-rest. This sad expression seems to be squeezed out of the head as the juice out of an orange, but it is not nearly so nice. It is the outcome of an agony, a mental and capital distress perhaps too great for words. It is not into this expression that art enters. Nor does it enter into what is known as physiognomy. Expression and physiognomy are, moreover, distinct; the latter is permanent, the former transient. Expression varies in the same person according to circumstances in different times. Physiognomy in the same person is always

the same. They probably are, in their origin, identical, expressing the physiological relations between the hidden movements of the brain and the many manifestations of the muscles of the face; but in physiognomy this relation is frozen and stereotyped, while it is momentary and fugitive in expression. Perhaps the nearest approach to art in photography is the transference to the paper of such of the fleeting expressions as are most characteristic of the person whose portrait is to be taken. It is not infrequently the case—a case partaking of the nature of a riddle—that in a picture otherwise good, well worked, and exact in most technical particulars, a something is, by the spectator, discovered to be absent which may be found in another portrait upon which not nearly so much labour has been expended—a portrait, too, which is decidedly inferior in general accuracy and scientific detail.

The key to this riddle consists in the fact that, in the latter picture, the operator has managed to seize a characteristic expression which, in the former, has been absent or unnoticed. It is this peculiar expression which really constitutes the likeness; it is the representation of truth; it does not depend on the camera, like the annihilation of freckles, or on position, like the shortening of a nose; it requires little aid from the retoucher, and it can scarcely be comprised in the vast catalogue of "dodges." The photographic portrait, possessing this beauty of truth, is a joy for ever.

Some famous painter—perhaps Stodhart—said that there was nothing so difficult as to paint people doing nothing. By this sentence he did not perhaps mean to imply that those who sit for their portraits should be employed in some manual exercise, but rather that their faces should not be idle. In other words, he found it not easy to obtain a good portrait without expression. If the ladies who come to our photographers expended less artistic pains on their furbelows, and allowed nature more room in their faces, disappointments and heart-rendings in the matter of their portraits would be less frequently the result. It is, however, perhaps as idle to hope for the extinction of what has been not inaptly designated the mongrel smile as of the many coloured clothing. The smile will probably always be with us, unless, indeed, it be banished by the application of the head-rest, when it commonly leaves in its place something worse, that expression of resigned agony mentioned above, and commonly known as the "photographic look;" and for the many coloured clothing, the prolonged discussion about the power of photography to represent colour interests not the majority of ladies in the least, and that majority would probably say that if the camera could not reproduce colour, why—it ought to.

Let nature work unrepressed, uncribbed, uncabined, unconfined. Get rid of the "smile," the "look," and their many unnatural congeners. Seize upon the expression which gives the hall-mark of individuality, and you gain that which is of more importance than much sharpness of finish, or softness of lighting, or dexterity of manipulation, or beauty of pose, the supreme photographic excellence, which gives the operator the title of artist, the virtue of expression, without which all the other technical virtues are as sounding brass and a tinkling cymbal.

The mouth is probably the most expressive of all the features. It is well-known that much of the expression which is attributed to the eyes is really due to this organ only. For sad eyes, for instance, we should read sad mouth. It is a fatal mistake for an artist in photography to attempt to control this feature. It is, we repeat, the chief seat of expression, which, again, is the index of the soul. Suppose a sitter comes to be photographed, to take an extreme case, with his mouth open; not, by any means, merely with parted lips, but a man of whom an open mouth is the normal facial condition; the photographer by telling him to shut it, will lose his likeness. His resultant picture may be more decent, but it will be nothing worth as a presentment of the original. Nor are the muscles of the eyebrow less worthy of attention than those of the lips. Four distinct muscles, as readers of anatomy are well aware, govern the motions of the brow. The varied expressions of sadness, surprise, fear, admiration, disdain, and other emotions produced by these, have been ably treated of by Duchenne in his "Mécanisme de la Physionomie Humaine," a kind of electro-physiologic analysis of the expression of the passions, illustrated with numerous photographs of interest, if not of profit, to every photographer.

Duchenne studied photography for the sole purpose of executing these pictures himself. "Photography, which," he says, "faithful as a mirror, will allow the reader to assist at my experiments, and to form a judgment of their value." The photographs are none of them retouched. Some taken in full sunlight recall the manner of Ribera; others, of the darker passions, such as fear and hatred, remind the spectator of the chiaroscuros of Rembrandt. The whole volume impresses upon the student the power of the subject of our article, so that we may, with a well-known artist in his profession, apply to expression and individuality what the author of the Book of Proverbs said of understanding and wisdom. Individuality is the principal thing; therefore get individuality, and with all thy getting, get Expression.

ALUMINIUM.—There is no other metal on the earth so widely scattered and occurring in such abundance as aluminium, yet it is never found metallic, says an American contemporary. But the combinations of aluminium with oxygen, the alkalies, fluorine, silicon and the acids, are so numerous, and occur so abundantly, as not only to form mountain masses, but to be also the bases of soils and clays. Especially numerous are the combinations with silicon and the other bases, which, in the form of felspar and mica mixed with quartz, form granite. These combinations, by the influence of the atmosphere, air, and water, are decomposed; the alkali is replaced or carried away, and the residues form clays, the clays form soils, and thus the surface of the earth becomes porous to water and fruitful. It is a curious fact that aluminium has never been found in animals or plants, which would seem to show that it is not necessary to their growth, and perhaps be injurious. Most of the aluminium compounds appear dull and disagreeable, such as felspar, mica, pigments, gneiss, porphyry, and trachyte; yet there are others possessing extraordinary lustre, and so beautiful as to be classed as precious stones. Among these are the ruby, sapphire, garnet, turquoise, and topaz. One would suppose that since aluminium occurs in such abundance over the whole earth that we literally tread it under foot, it would be extracted and applied to numberless uses, being made as abundant and useful as iron. But such is not the case. Beauxite and cryolite are the minerals most used for producing aluminium, and their preference lies mainly in their purity. Native alums generally contain iron, which must be removed by expensive processes. Beauxite comes from Austria and France, and has only been found in this country in Floyd county, Georgia. Cryolite comes from Greenland. It has been found in Colorado in very small quantity. Native sulphate of aluminia has been found on the Gila river, Socorro county, N.M.—*Invention.*

DEVELOPERS USED BY GERMAN PROFESSIONAL PHOTOGRAPHERS.*

BY JULIUS F. SACHSE.

Theodore Schafgans, junr., Bonn.—Developer—Until a few months ago, oxalate; now I have adopted eikonogen, and use it exclusively. Advantages—With eikonogen the film remains wonderfully clean and clear, the plate shows greater plastique, and beautiful high lights. With the dexterous use of old developer over-exposed plates may be brought to the proper density, and per contra, greatly under-exposed plates may be saved by use of the strong developer. Composition — With normal and properly exposed plates I use the developer exactly according to the formulæ of Dr. Krugener. With doubtful exposures I commence with old developer, and, according to circumstances, finish with fresh developer. The development must only be done by a weak red light, or the plates are apt to fog and the fine lights disappear. I have also found that the two solutions must be kept separate until just before use; also that if two solutions are mixed in large quantities, the developer loses its power after two days. Accelerators—My experiments prove that they do not hasten development.

E. Lassen, Ratzeburg. — Developer — Eikonogen. Advantages—Since six months ago I have worked with eikonogen, and am well satisfied. We obtain brilliant negatives, high lights, middle tones, and clearness of shadows, with rich detail. Time of exposure is shortened one-third in relation to oxalate, and it is cheaper. Composition—(A) Distilled water, boiled, 600 g.; sulphite of soda, 100 g.; potash, 40 g.; eikonogen, 20 g. When the water boils, dissolve first sulphite, then potash, and lastly eikonogen. Accelerator—None.

C. Westendarp, Cöln.—Developer—Eikonogen. Advantages—Surety, simplicity, cheapness. Composition—I use the formula of the manufacturer. When developing, however, I take half old developer; the plates remain clearer, and any desired grade of strength can be obtained thereby. Accelerator—None.

Wm. Bergmann, Moers.—Developer—Ferrous oxalate. Advantages—Surety, simplicity, cheapness. Composition—(A) Iron, 1 : 3. (B) Oxalate potash, 1 : 3. One part A, three parts B. Accelerator—With extremely short exposures, hyposulphite of soda 1 : 2,000.

Aug. Classens, Aachen. Developer—Oxalate. Advantages—The constancy. Composition—In summer, 1 : 5; exposure 1 : 1½ seconds. Winter, 1 : 5; exposure 2 : 3 seconds. Accelerator—With drop shutter exposures of $\frac{1}{6}$ to $\frac{1}{4}$ seconds, a few drops of dilute hypo in developer.

F. Courte, Püttlingen. — Developer — Iron oxalate. Advantages—Simplicity and constant properties of development. Adaptable to all kinds of exposure. Cheapness. Composition—Saturated solution of oxalate of potash. (A) Iron, 30 g.; water, 100 c.cm. A few drops of 2 per cent. solution of tartaric acid. (B) Old developer with a few drops of above tartaric acid solution added. For use in normal exposures: Iron (A), 1 part; old developer (B), 1 part; saturated solution of oxalate, 2 parts. For over-exposed plates: Iron (A), 1 part; old developer (B), 2 parts. For very short exposures: Iron, 1 part; oxalate, 3 parts. Accelerator—None.

Joh. Freund, Schliechtron. — Developer — Oxalate of potash and iron. Advantages—Simple manipulation and sure results. Composition — (A) Oxalate of potash, 30 parts; distilled water, 100 parts. (B) Iron vitriol, 30 parts; distilled water, 90 parts. Just before use: 3 parts A and 1 part B, with a few drops of bromide of potassium, 1 : 10. Accelerator—None.

H. Haberlandt, Berlin.—Developer—After all developers have been tried, I have left all, even eikonogen, and return to the iron developer. Advantages—Iron acts quicker than eikonogen. I would prefer pyro on account of its finer detail if I only had portrait plates to develop; further, iron and pyro—unless through carelessness—never fog, while eikonogen easily does. This, however, may be the fault of the unequal quality of even the best sulphite. Composition—(1) Oxalate of potash, 300; water, 1,000. (2) Iron, 300; water, 1,000. One part iron to three parts oxalate. I make both solutions with hot water, and filter. In No. 2, I pour two drops concentrated sulphuric acid to every 100 g. of hot water, then dissolve the iron, and filter. Accelerator—One part hypo to 8,000 to 10,000 parts of water, only with drop-shutter exposures.

Louis Hermestroff, Metz.—Developer—Iron oxalate. Composition—Potash, 1 to 3½; iron, 1 to 3. Three parts of potash and one part of iron, both dissolved in hot water. Accelerator—With drop-shutter exposures, hypo 1 : 1,000.

J. F. Klinger, Braunau ob. Oesterreich.—Developer—Iron oxalate. Advantages—The always even results with Monckhoven dry plates, with fine modulation, close grain, and high-lights. Composition—(A) Neutral oxalate of potash, 300 g.; distilled water, 1,000 g. (B) Iron vitriol, 300 g.; distilled water, 1,000 g. Three to four drops of sulphuric acid. For use, 4 parts potash, 1 part iron. Reduction if necessary. Hypo, 200 g.; water, 1,000 g.; red pruss., 1-5. Accelerator—Children with advantage: Water, 3,000 g.; hypo, 1 g.; citric acid, 3 g.

A. zur Mühlen, Magdeburg.—Developer—Oxalate. Advantages—With accelerator, soft and clear shadows. Composition—Oxalate 1-4, iron 1-3. For use, 1 part iron, 3 parts oxalate. Accelerator—Hypo.

Alfred Person, Lahr.—Developer—Oxalate. Advantages—Clear plates. Grey colour and rapid printers. Composition—(1) Oxalate, 300 g.; water, 1,000 g. (2) Iron, 100 g.; water, 3,000 g. For use, 1 three parts, 2 one part. Consider the developer the best. Have developed shortest drop-shutter exposures with success. Accelerator—None.

Prof. C. C. Schirm, Berlin.—Developer—Ferrous oxalate, with accelerator (250 water, 1 part hypo), and an addition of weak solution of hypo and bromide to developer. Advantages—Evenness in appearance of lights and shadows, and the correct relation to each other, gradation and beauty in detail. Composition—(A) Oxalate of potash, 1; water, 3. (B) Iron vitriol, 1; water, 4. One part of B to three parts of A with the addition of one drop of solution. Hypo, 0·5; bromide, 3 g.; water, 100 g. to every 10 c.cm. of developer. Also two-thirds of old developer to one-third fresh. Accelerator—One of hypo to 2,500 of water.

L. Schmidt, Freiberg. — Developer — Iron oxalate. Advantages—Works not too slow, gives clear shadows with all detail and high-lights, when suitable dry plates are used. Composition—(A) Oxalate of potash, neutral, 300 g.; distilled water, 1,000 g. (B) Sulph. iron, 100 g.; distilled water, 300 g. Sulph. acid, c.p., two to three drops immediately before use, three parts of A to one of B, with under-exposed plates, to every 100 g. of developer one or two drops of hypo 1 : 100. Over-exposure, 1

* Continued from p. 540.

regulate the development with the addition of bromide 1 : 10, drop by drop. Accelerator—None. [Note.—Have tried eikonogen in various ways, but prefer iron oxalate to all others. I, however, think the time will come before long when, with different combinations, the eikonogen developer will be deemed the best.]

L. Stuting, Hofphotograph, Barmen.—Developer—Oxalate of potash with iron. Advantages—I have found that it works clearer and stronger than all others. Composition—Saturated solutions of oxalate and iron, 3 parts of ammonia to 1 part of iron. Accelerator—With drop-shutter and interiors 1 part of hypo, 2,000 of water, to which add a few drops of 10 per cent. bichloride of mercury.

George Muller, Eltville.—Developer—During the last six months a prepared hydrochinone developer, which has kept well and remains clear. I use it fresh for instantaneous, and old for time exposures. Advantages—Softness combined with fine lights, and especially fine detail in the shadows—good colour of the negatives. Composition—(A) Water, 400 g.; sulphite of soda, 45 g. (B) Water, 450 g.; soda, 45 g.; potash, 45 g.; sulphite of soda, 45 g. For a plate 13 by 18 cm. take A, 40; B, 5; 10 drops of bromide. After these are in the developing glass, add just before use a small thimble-full of dry pyro. Accelerator—None.

Hubert Koch, Kevelaer.—Developer—Pyrogallic acid. Advantages—It gives strong negatives with soft modulation, develops strongly and quickly. Negatives are easy printers on account of the bluish colour of the plates; extreme cleanliness. Excellent results can be obtained. Composition—(A) Water, 500 g.; sulphite soda, 100 g.; 10 drops sulphuric acid. (B) Soda, 50 g.; Water, 500 g. Before use—4 parts water, 3 parts A to 3 parts B. (Note—pyro not given.) Sulphite of soda added to fixing bath. Accelerator—None.

These replies will suffice to show the general trend of the German portrait artists. We find that the publishers of the *Photographishches Archiv* sent out a total of one hundred and forty-five queries throughout Germany and Austria-Hungary. Eighty replies were received, forty-eight of which have been reproduced in these columns for the benefit of our readers, both professional and amateur. From the great stretch of territory covered by these responses, they may be accepted as fair representatives of the whole body of photographers who are scattered throughout the Fatherland. The result arrived at shows that ferrous oxalate is still the most generally used agent in the development—more than one-half (44-80ths) still adhere to the old stand-by; twenty-five per cent. (20-80ths) have become converts to the latest candidate for photographic favour, viz., eikonogen. Next comes hydrochinon or fifteen per cent. (12-80th), and finally pyro (8-80th), or 10 per cent. of the whole number of replies received.

In analyzing the total replies, we find that in the advantages claimed for the ferrous oxalate, seventeen claim simplicity and surety, nine claim equality of work, nine claim capabilites of modulation, seven claim clearness of negatives, seven claim rapidity of development, seven claim cheapness of price, three claim cleanliness, two claim greater latitude of exposure, two claim value of copying properties.

Of those in favour of eikonogen, thirteen claim that the new developer is superior to all others in producing soft and clear, yet at the same time strong negatives, ten claim that the time of exposure is much shortened, eight claim greater detail in the shadows, seven claim rapidity of work, seven claim brilliant middle tones and high lights, four claim advantages of repeated use, two claim negatives that are easy printers and cleanliness in development.

Hydrochinon: five claim keeping qualities of developer, three claim soft and strong negatives, and convenient for application, three claim surety of work, two claim fine modulations.

Pyrogallic acid: four claim superior brilliancy and detail in negative, with good colour for printing; further, great latitude of exposure, that it keeps well in separate solutions, and acts quickly. The developer, however, requires great cleanliness in all manipulations.

As to the accelerator, it is apparent that with the use of eikonogen and pyro it is unnecessary, with hydrochinon only occasionally, while with ferrous oxalate it is requisite in half the normal cases, while it is always required with drop shutter exposures or in cloudy weather; the usual formula is hypo in a very dilute solution 1 to 1,000 to 10,000, and occasionally with the addition of a few drops of solution bichloride mercury.

The editor of the *Archiv* closes the subject with the statement that although the returns make no pretension to completeness, he is yet convinced that the imparted information from practical experience will prove of great service to the craft in general, giving many valuable hints and points to the professional as well as the intelligent amateur.

A MISCONCEPTION.—Clara: "Well, Aunt, have your photographs come from Mr. Snappeschotte's?" Miss Maydeval (angrily): "Yes, and they went back, too, with a note expressing my opinion of his impudence." Clara: "Gracious! What was it?" Miss M.: "Why, on the back of every picture were these words: 'The original of this is carefully preserved.'" —*Pittsburg Bulletin.*

MESSRS. EGLINGTON AND CO. announce that the August number of *Men and Women of the Day* will contain three panel photographs (10 by 7½ inches) of Mr. and Mrs. Stanley (Miss Dorothy Tennant), and Lieut. Stairs, together with authentic biographies. The publishers state that the photographs have been specially taken for this publication, which is a national photo-biographic journal, and that the portrait of Mrs. Stanley is one of the few authorised photographs published.

AN INTERNATIONAL EXHIBITION.—An Exhibition, promoted by the Edinburgh Photographic Society, is to be held in the Galleries of the Royal Scottish Academy, Edinburgh, November, 1890, to January, 1891. The object of the Exhibition is stated to be to direct attention to the development in recent years of photography, and to stimulate further advances by encouraging artistic skill and invention. In addition to the ordinary character of photographic exhibits, it is intended to illustrate historically and technically the processes connected with the art in their various stages, and the council will regard it as a special favour if those having unique specimens, especially of the earlier processes and apparatus, will kindly lend them for exhibition. Besides the above-mentioned exhibits, the council have thought it desirable to embrace in their operations a scheme of lectures, in which the different processes in connection with photography will be practically explained and illustrated. These lectures will be given by speakers thoroughly qualified in the treatment of their subjects, and it is contemplated to have one in each week during the continuance of the Exhibition. A series of awards will be granted, and the council will appoint, to act as judges, five qualified persons, whose names will be announced at an early date. A gold medal and silver and bronze medals will be awarded for pictures according to merit. The secretary is Mr. Thomas Barclay, 180, Dalkeith Road, Edinburgh.

HOME PORTRAITURE.

BY H. H. SUPPLEE.

It seems to be generally admitted that the amateur begins by undertaking the most difficult branches of work first, and after meeting with divers discouragements, either abandons the whole affair or else gradually discovers the error of his ways and gets hold of the right end and moves on to success and satisfaction. The beginner's idea of a photograph is a picture of somebody, and of a camera as an apparatus for taking people's pictures with, and in many cases that is all he wants it for; and when he is carefully advised to start with slow plates, and essay only well-lighted views, he naturally resents such ill-timed suggestions, and generally goes home immediately and proceeds to "take the baby."

This proceeding, however, is rarely a success, and usually it is only after many tribulations that really satisfactory home portraits are produced; but there really seems to be no good reason why some of the trials and failures might not be avoided, or why one may not profit by the hard-bought experience of others in this most desirable and pleasant branch of amateur work.

To make fairly good portrait work, however, requires suitable tools; but these need not necessarily be the most expensive. The lens should be of fairly long focus—about twelve inches—and the rapid rectilinear type will generally be found most available. If the cost of this be found too high, good work may be done with a single achromatic landscape lens of about fifteen inches focal length, in which the fixed stop has been reamed out to a size of not less than one inch to one and a-quarter inches. This enlargement of aperture will of course materially reduce the marginal definition of the field; but when that is wanted smaller diaphragms may be inserted, and for portraits, where only the very centre of the field is to be employed, the increased opening will give the desired speed, while with this length of focus and limited field the spherical distortion is so small that it may be neglected. For portraits great depth of focus is not needed, and, indeed, in many cases is undesirable, and if good definition is obtained upon the features, so that the true expression is secured, the sharpness may well be permitted to diminish for the remainder. Of course the possession of a fine portrait combination is much to be desired, and where the expense of this is prohibitory the intermediate types, such as the Steinheil anti-planet or the new Voigtlander euryscope, are nearly as good.

As far as the camera goes, anything which is steady and light-tight will answer, and it is unnecessary to spend money in that direction. For cabinet portraits, 5 by 7 holders are about right, giving a moderate margin for centreing and trimming.

The amateur is generally limited in his supply of screens and backgrounds, but sometimes the extemporised affairs are more pleasing than the orthodox professional pilasters, balustrades, or gates, and if care and taste are displayed in handling the subject, the less conspicuous the background the more satisfactory the result is likely to be.

A framework somewhat resembling a large clothes-horse can readily and cheaply be made at a neighbouring carpenter's shop, and should be about eight feet high by ten feet wide, and, for convenience of storage, it may be pinned together so as to be readily knocked down, and stood away when not in use. Upon this frame various things may be draped, and often very effective results obtained. There should be one curtain of grey flannel, giving, when photographed, a neutral tint just right for vignetting, and soft enough to hang in easy folds without looking harsh or stiff. This may be hung from the top by hooks and rings, or may be smoothly drawn when the picture is to be vignetted and the folds are not desired. Many styles of shawls produce effective backgrounds, especially when far enough back from the sitter to be somewhat out of focus; while, in most cases, the easy chair which does duty for a posing chair is less obtrusive and more effective if entirely concealed under drapery whose apparently careless folds are not altogether accidental.

When the floor at the feet of the sitter is to appear in the photograph, it should be kept subordinate to the other details, and a brilliant carpet pattern is best covered by some quieter rug or mat. Skin robes or mats are often quietly effective, and seem to hold the light they receive in a way which has shown itself serviceable.

The great point, however, in amateur portraiture is the illumination. The absence of a skylight, and the difficulties in the way of controlling the light which is to be had—these are the common causes of the defects to be seen in most home portraits. A room should be chosen with as high a ceiling as possible, and with a projecting bay window whose openings extend as high as can be secured. If there are other windows, let them be closed, so that the light shall come approximately from one direction. Never mind the exposure; west or south will do, if only the quantity and direction of the light can be controlled.

Place the camera close to the middle window, leaving only room enough to get behind it, and close the lower shutters behind the camera, leaving the upper ones above it partly open to secure a slight front illumination. Upon one side the shutters of the bay window should be opened entirely, so that the most brilliant light falls upon the sitter from that direction, and then by regulating the amount of opening upon the other side the shadows may be softened to any desired extent. At first the effect should be examined upon the focussing screen of the camera, which should be of the finest ground glass obtainable. Use the full opening of the lens, and focus upon the eyes of the model, and the definition of the rest will take care of itself. A microscopic sharpness, by which every thread in the garment may be counted, is readily obtained by using a smaller aperture; but such precision is not wanted.

Never mind about head-rests or their substitutes, but try to place the sitter in such an easy and comfortable position that such supports will not be needed. Avoid straight lines in the composition, and if the lens is of sufficient focal length there need be no fear of undue distortion of points nearest the camera. Standing just behind the camera, direct your sitter to glance in the direction which, in your judgment, gives the best effect, and then selecting some object upon which the eyes may rest, the exposure may be made. With rapid plates, such as Seed 26, or Cramer 35-40, two or three seconds with bright daylight will be sufficient, using an aperture of F8; but the beginner must expect to waste a few plates in gauging the light of his extemporised gallery. After having arranged the details of this part of the work, however, the amateur will soon find the photographic side of the work a matter of routine, and be able to devote his thought and attention to the higher and more artistic matters of posing, draping, and composition, in which, if he will, he may find a source of endless delight.—*Amer. Journ. of Photography.*

Notes.

Mr. J. R. Gotz has sent us some half-plate specimens of flexible films of gelatine rendered insoluble and coated with the Obernetter emulsion. They are thinner and more flexible than those of celluloid, but in the developing solutions absorb water and increase considerably in thickness, acquiring at the same time a leathery, slippery feel, and increasing much in weight. They are not so "horny" when handled as celluloid films. Despite their thickness, we found no difficulty in using them in an ordinary dark slide, simply by placing them therein with a piece of black cardboard behind. They are coated with the Obernetter emulsion, and the latter works well. The negatives require aluming. Full instructions for use accompany each packet.

The statue to Daguerre about to be erected in front of the Smithsonian Institute at Washington is nearly completed in the artist's studio, and will be erected on the 12th August next. The bronze portion is sixteen feet high, and upon the granite beneath is the following inscription :—"To commemorate the first half-century in photography, 1839-1889. Photography, the electric telegraph, and the steam engine, are the three great discoveries of the age. No five centuries in human progress can show such strides as these. Erected by The Photographers' Association of America. August, 1890." All photographers must be pleased at the erection of this monument, and the only criticism we have to make is, that it would have been well if, before selecting the subject, its promoters had instituted some real, sound, historical research as to the rival merits of Niépce de Chalons and Daguerre. The general tendency of comparatively recent research has been to show that the merits of Nicephore Niépce exceed those of Daguerre in relation to the founding of photography. A chief point in Daguerre's favour is the discovery of mercurial development. A school of historical criticism in photography is desirable at the present time, for the few who consult original documents are aware how numerous are the historical errors which rapidly become popular, and which can afterwards be eradicated from the public mind only with difficulty.

There is little of a photographic nature at the French Exhibition in London. Messrs. Haret Frères, of Paris, have erected an oak stand for exhibiting a considerable number of large photographs in wooden frames, which frames are hinged to a central pillar. The principle is not new, but the design is of interest, because it is the one selected by the authorities of the Musée du Louvre as the best brought before them for displaying large pictures in a limited amount of space. The pictures in the frames consist of some subjects in the national art galleries of Europe, photographed by Braun and Co., of Dornach. Messrs. A. C. Vasseur and Co., of Paris, exhibit a considerable number of French photo-mechanical prints, some of them in colours. Mr. Reitlinger, a Hungarian, with a manufactory in France, exhibits some artistic frames of white metal, to hold photographs; and Mr. Rosenmann some remarkable metallic pens for writing, sketching, or other purposes, the nibs of which can be bent in any direction without breaking, and the pen then restored to its original form. Among the amusements at the Exhibition, the driving of the lions is a great attraction; a "Japanese" conjuring entertainment is of an elegant and refined character, and a burlesque of Robinson Crusoe contains poetry of the following type :—

> *Crusoe* :—"Friday! There's cannibals on this isle;
> They've just put a black man on to bile."

In the grounds is a cosmorama, containing photographs of scenes in France.

The English amateur photographers who make a speciality of instantaneous work missed a chance on Sunday morning, when the *Sans Peur* Bird Society, of Brussels, contested its annual race from London. The members of the *Sans Peur* Society are pigeon-fanciers, and on this occasion an enormous number of birds were liberated from the Thames Embankment adjoining Millbank Prison. When a similar contest took place in Paris, a few months ago, the President of the French Photographic Society invited amateur photographers to attend, as this monster flight of pigeons offered a good opportunity of showing of what instantaneous photography was capable. The English societies apparently are not alive to this, for, so far as we know, no representative was present on the occasion mentioned above.

The ingenious photographer who keeps a sharp eye upon the "hatched, matched, and dispatched" column of the *Times* has been distanced by a still more ingenious rival. The method of the first-named is to photograph every morning the column in question, divided into three sections, and send a copy to the persons concerned, with the request for sixpence for his trouble. The new man haunts cemeteries, and with his camera photographs all the new grave-stones that are erected. Then, having obtained the address of the relatives of the deceased person, he posts a copy of the photograph with the intimation that he is willing to supply "a dozen *souvenirs* of the departed for 5s. 6d." The number of orders the photographer receives is stated to be surprising.

Of a kindred nature is the crematory urn just patented in America. This is an arrangement by which the ashes of the defunct person are always on view. The bowl is made of the finest crystal glass, mounted in elaborately decorated silver. A crest surmounts the urn, which shows, in addition, masonic emblems and two shields for inscription. Above all is a space for a photograph, which, of course, gives a very realistic

touch to the whole affair. Despite its completeness, we doubt whether this transparent urn will be agreeable to English taste.

It is sad to read of the death of Mr. Payne, headmaster of Harrington School, near Preston. He was an enthusiastic amateur photographer, and was spending his holidays at Ingleton, and in endeavouring to get a good photograph of a rustic bridge, he fell from a considerable height to the rocks below and was killed on the spot. We are inclined to think that amateurs frequently incur a risk of accidents in similar fashion. They allow their enthusiasm to run away with them for the moment, and in their anxiety to get some view they fancy, are perfectly heedless of danger. In some respects the amateur photographer, especially if he be a beginner, is like the youthful angler, who is apt to think that the more inaccessible the spot, the more likelihood of sport, and he strains every nerve to get to some particular point which older men with cooler heads would have the philosophy to leave alone.

Mr. Samuel Plimsoll is quite alive to the advantages of photography. In the most recent of his pamphlets, which have done so much to raise the condition of the sailor, he deals with the question of cattle ships, and what may be rightly termed their "horrors." It would be out of place to enter into any discussion of the revelations which Mr. Plimsoll details so graphically; all we need draw attention to is, the assistance which he has derived from photography. Dealing with the meat supply question, as regards London, he gives the consumer a mass of valuable information, by means of reproductions from photographs, of all the market operations of Smithfield, and one can only regret that he overlooked photographing what would convey most important hints to materfamilias when she buys the Sunday joint. He gives representations of the hind quarters of cattle dressed in the American and English fashion, and these are all very well as far as they go, but, unfortunately, they are drawn, and not photographed. This seems an unaccountable omission, as photographs could have been easily obtained, and would have shown the difference between the two in a forcible manner.

Still, we are grateful to Mr. Plimsoll for what he has done, and especially in regard to the photographic operations carried on in America, in regard to the cattle ships. He says that, in the outset of the investigations, he sought the aid of his brother in New York, and requested him to employ a photographer in that city to obtain photographs of vessels loading and loaded with live cattle. This was done by a professional photographer, Mr. Barrett, an amateur assisting him. The photographs, reproductions of which are given in the volume, are twelve in number, and depict most graphically the conditions under which the sailors have to work. It seems that the decks are formed simply by the roofs of the cattle-sheds, are full of openings, and have not the least vestige of a bulwark. As for the way in which the cattle are stowed, the less said about it the better. It is significant that, in some cases, permission to photograph was refused, and it is clear that the people concerned had a wholesome dread of the evidence of photography.

A new use has been found for our old friend pyro by Dr. Gautrelet, of Vichy, who lays claim to the discovery that it renders tobacco harmless to mouth, heart, and nerves, without in any way spoiling the soothing effect or the aroma of the seductive weed. The proper way to bring about this desirable result is to plug the pipe or cigar holder with a pledget of cotton wool which has been soaked in a ten per cent. solution of the pyrogallol, so that the smoke drawn through this filter may be robbed of its bad qualities, and the noxious weed may be noxious no longer. With this precaution the tongue will not fur, the head will not ache, and everyone will be able to smoke with impunity. We are not quite sure, but we fancy that if every smoker were to take the trouble to insert in his pipe a wisp of cotton wool as a bed for the tobacco to rest upon, all the evils with which the weed is credited would be obviated without any aid from pyrogallol. It must be remembered that the latter, from its poisonous nature, might possibly prove to be more dangerous than the nicotine.

Hand camera work must have been, during these last two months of cloudy skies and general darkness, quite at a standstill, and the detective agency whose novel advertisement we quoted a fortnight ago must have found their efforts to secure compromising pictures severely handicapped. Even in the best of weather such pictures will present great difficulties. Let us, for instance, take the case of some unfortunate couple whose portraits a paid spy armed with a camera is anxious to secure. The picture must be taken in sunlight, with the faces of the victims turned towards the instrument, so that there may be no doubt as to identity, and at the same time the operator must be careful that he himself is not detected. With all these things opposing him, the chances are ten thousand to one against success, and glad we are that this is the case.

The actual difficulties of instantaneous portraiture with hand-cameras may be guaged from the circumstance that such portraits of well-known public characters are never seen. If they were easy to procure the market would teem with them, for they would find a ready sale. The only case of the kind of which we are cognisant is an extremely unflattering portrait of her Majesty the Queen smiling in her carriage. This was exhibited in the shop windows about a year ago. Her Majesty's countenance is so well known to everyone that the picture can be recognised, but if it had represented any one of less note it would have been almost useless; at any rate, as a means of identification.

ILLUSTRATING POEMS BY PHOTOGRAPHY.*

BY CATHARINE WEED BARNES.

As the Venus of Milo stood before her sculptor-creator saying to his inner consciousness, "You have made me visible to men, but among them, as on Olympus, none shall question my sovereignty"; so poetry says to her various adorers, "No one shall be able to say he has sounded the depth of my soul." One approaches nearest her inmost shrine in closely following nature, and it is the part of true wisdom to study her under all the ever-changing conditions of life with a reverend worship which will richly reward every faithful worshipper. Not to those who deny her power, or to those who try to force themselves into her most sacred penetralia, are its mysteries discovered, but to those who in spirit and in truth wait before its altar. Painters and sculptors have sought through all ages to reveal poetry by means of form and colour with all the varying expression of her changeful features, but there is no reason, it seems to me, why, among those who seek to translate into visible shape her spiritual beauty, only those should be numbered to whom heretofore the world has given the name of "artist." Why should the fact of using brush or pencil presuppose in its user the possession of artistic power or appreciation? The world does move, and people are beginning to understand that after all it matters little what tools are used if into the finished work is breathed the breath of artistic life. Our friend Dr. Emerson seems to think that by the blending of art and science in photography each is thereby weakened, that each should keep to its own sphere. Is it not possible to study science in this connection as one does the steps in dancing, very important to follow closely at first, but gradually becoming a second nature, so that one, so to speak, forgets the letter in the spirit?

Let your work be so much a part of you that while not conscious of moving according to fixed rules, you are nevertheless largely guided by them.

Travellers abroad can purchase the poems of Scott, Burns, or others, illustrated by photographs of scenery and buildings, but few and far between are the photographic illustrations designed to specially bring out the spirit of the poem as the painter or etcher designs his special work. The photographer must, of course, labour within limits, but I believe they are more flexible than generally supposed. While it is not always possible to make one's model fit the picture, it is possible to make the picture fit the model. In other words, I believe that, after careful choice of lines to be illustrated, the intended picture should be evolved from one's brain by thinking of it, brooding over it, dreaming of it, until all is ready for the realisation. Take plenty of time to absorb into your very soul the thoughts of the poem before you. Then carefully decide on the accessories, and, if practicable, discard those which are readily recognised as being in ordinary studio use. Have real curtains, chairs of wood or brass, or other material not made to simulate something else. I make an exception in favour of using artificial flowers and vines, but sparingly. If the operator is not a carpenter, one can be found to construct temporary doors and windows. They are better than the painted article, and *papier-mache* is so glaringly a false deceiver. If the deception could be well done it would be allowable, but the average rocks, walls, trees, &c., are only too visibly unrealities. These things need not be necessarily expensive if the camerist is possessed of dramatic taste and is something of a mechanic. The professional is usually assisted during an exposure by some one to focus while he is posing, and has everything ready for the work, while the amateur portraitist has to be almost omnipresent, so that he works under much greater difficulties than his professional brother, and if he did not really deserve the name "amateur," never would have courage and patience to continue, but the camera fever when it reaches a certain stage is incurable.

It should be the exception when pictures of out-door scenes are taken by indoor light, even the light of the studio. It conveys a wrong impression to the uneducated eye, and, in the branch of photography under consideration, does more harm than good. There is no need either of all the pictures being made in the studio. But where interiors, fancy figures, or portraits are needed, the studio is the place wherein to make them. No hard or fast rule can be laid down on the mode of studying out or realising illustrations. To a great extent the artistic operator must be a law unto himself or herself, but, while working in limits, I believe in stretching them as far as possible and taking advantage of everything within them. If the model, when found, does not entirely suit the character desired, it is often well to slightly vary one's conception of it and gain thereby, it may be, a finer effect than the one intended. There should be, and I say it from experience, a magnetic relation between sitter and operator, their minds should work together, and the words to be wrought out in the picture should occupy their thoughts to the exclusion, for the time being, of all else. As the actor or opera singer best realises a character by utter forgetfulness of self, so ought the ideal sitter to think so fully of the part to be represented that the idea never occurs to him or her that it is a "portrait" which is being taken. "You are only a part of a whole," I say in such cases, "it is not you any more than the chair you sit upon that is being photographed."

It requires a certain amount of histrionic ability to sit for an ordinary portrait, but infinitely more for an ideal subject. This is not common, but where it exists the camera can be sure of extra credit which should be shared with the sitter. The various difficulties incident to taking small heads and figures greatly increase when it comes to taking large ones, and justly the camerist who takes good ones is proud of them. Do not try to get a *likeness* of your model. The point is to have the picture tell a story; make it do that at any cost, and it matters nothing at all if the face is not shown or is utterly unrecognisable. Let imagination dominate your thoughts, and your work will have originality, character, not be like that of any one else. This means, however, putting enough labour and thought on one picture to take a dozen ordinary portraits. The artistic camerist should also bear in mind by what process his work will be reproduced, and keep that thought ever before him from the instant of exposure until the negative is developed. Training in some branch of art is capital preparation for illustrating, and every picture designed is an education for the next one. The eye becomes more and more accustomed to realising in a picture certain stanzas or lines, and new ones will be constantly suggested.

There is one point more that I never have heard mentioned. In taking an interior for illustration, if done in the studio, it is possible to arrange a ceiling over the sitter so that the effect of a room can be better preserved, and the light come, as it naturally would do, from the side.

* Read before the Society of Amateur Photographers of New York.

It is a good plan, also, where an out-door scene is desired, to arrange either by means of a mirror, or water in a tank, to simulate a stream or lake, and prevent reflections from the roof by stretching painted canvas over it.

This subject of illustrating poems is destined to bring about some striking changes in the world of art, and "weary, stale, flat, and unprofitable" will gradually seem to the ambitious amateur all other branches of camera work. It is inconceivably fascinating, and one's brain becomes bewildered at what seems to be its destiny. The various new and beautiful reproducing processes constantly claiming attention seem created for this very purpose. The camera has a wonderful future before it, and you will need all the inspiration you can possibly gain in entering a field of work filled with so many opportunities, but which others claimed to have owned long before you. Remember first, last, and all the time, these words from Longfellow's "Kavanagh":—"We judge ourselves by what we feel capable of doing, while others judge us by what we have already done."

THE PHOTOGRAPHIC IMAGE.*

BY PROFESSOR RAPHAEL MELDOLA, F.R.S., M.R.I.

The history of a discovery which has been developed to such a remarkable degree of perfection as photography has naturally been a fruitful source of discussion among those who interest themselves in tracing the progress of science. It is only my presence in this lecture theatre, in which the first public discourse on photography was given by Thomas Wedgwood at the beginning of the century, that justifies my treading once again a path which has already been so thoroughly well beaten. If any further justification for trespassing upon the ground of the historian is needed, it will be found in the circumstance that in the autumn of last year there was held a celebration of what was generally regarded as the jubilee of the discovery. This celebration was considered by many to have reference to the public disclosure of the Daguerreotype process, made through the mouth of Arago to the French Academy of Sciences on August 10th, 1839. There is no doubt that the introduction of this process marked a distinct epoch in the history of the art, and gave a great impetus to its subsequent development. But, while giving full recognition to the value of the discovery of Daguerre, we must not allow the work of his predecessors and contemporaries in the same field to sink into oblivion. After the lapse of half a century we are in a better position to consider fairly the influence of the work of different investigators upon modern photographic processes.

I have not the least desire on the present occasion to raise the ghosts of dead controversies. In fact, the history of the discovery of photography is one of those subjects which can be dealt with in various ways, according to the meaning assigned to the term. There is ample scope for the display of what Mr. Herbert Spencer calls the "bias of patriotism." If the word "photography" be interpreted literally as writing or inscribing by light, without any reference to the subsequent permanence of the inscription, then the person who first intentionally caused a design to be imprinted by light upon a photosensitive compound must be regarded as the first photographer. According to Dr. Eder, of Vienna, we must place this experiment to the credit of Johann Heinrich Schulze, the son of a German tailor, who was born in the Duchy of Madgeburg, in Prussia, in 1687, and who died in 1744, after a life of extraordinary activity as a linguist, theologian, physician, and philosopher. In the year 1727, when experimenting on the subject of phosphorescence, Schulze observed that by pouring nitric acid, in which some silver had previously been dissolved, on to chalk, the undissolved earthy residue had acquired the property of darkening on exposure to light. This effect was shown to be due to light, and not to heat. By pasting words cut out in paper on the side of the bottle containing his precipitate, Schulze obtained copies of the letters on the silvered chalk. The German philosopher certainly produced what might be called a temporary photogram. Whatever value is attached to this observation in the development of modern photography, it must be conceded that a considerable advance was made by spreading the sensitive compound over a surface instead of using it in mass. It is hardly necessary to remind you here that such an advance was made by Wedgwood and Davy in 1802.* The impressions produced by these last experimenters were, unfortunately, of no more permanence than those obtained by Schulze three-quarters of a century before them.

It will, perhaps, be safer for the historian of this art to restrict the term photograph to such impressions as are possessed of permanence. I do not, of course, mean absolute permanence, but ordinary durability in the common-sense acceptation of the term. From this point of view the first real photographs, *i.e.*, permanent impressions of the camera picture, were obtained on bitumen films by Joseph Nicéphore Niepce, of Châlons-sur-Saône, who, after about twenty years' work at the subject, had perfected his discovery by 1826. Then came the days of silver salts again, when Daguerre, who commenced work in 1824, entered into a partnership with Niepce in 1829, which was brought to a termination by the death of the latter in 1833. The partnership was renewed between Daguerre and Niepce de St. Victor, nephew of the elder Niepce. The method of fixing the camera picture on a film of silver iodide on a silvered copper plate—the process justly associated with the name of Daguerre—was ripe for disclosure by 1838, and was actually made known in 1839.

The impartial historian of photography who examines critically into the evidence will find that, quite independently of the French pioneers, experiments on the use of silver salts had been going on in this country, and photographs, in the true sense, had been produced almost simultaneously with the announcement of the Daguerreotype process, by two Englishmen whose names are as household words in the ranks of science—I refer to William Henry Fox Talbot and Sir John Herschel. Fox Talbot commenced experimenting with silver salts on paper in 1834, and the following year he succeeded in imprinting the camera picture on paper coated with the chloride. In January, 1839, some of his "photogenic drawings"—the first "silver prints ever obtained—were exhibited in this Institution by Michael Faraday. In the same month he communicated his first paper on a photographic process to the Royal Society, and in the following month he read a second paper before the

* This is the full text of Professor Meldola's recent lecture at the Royal Institution, of which we gave a brief report.

* "An Account of a Method of Copying Painting upon Glass, and of making Profiles by the Agency of Light upon Nitrate of Silver. Invented by T. Wedgwood, Esq. With Observations by H. Davy." *Journ. R.I.*, 1802, p. 170.

same society, giving the method of preparing the sensitive paper and of fixing the prints. The outcome of this work was the "Calotype" or Talbotype process, which was sufficiently perfected for portraiture by 1840, and which was fully described in a paper communicated to the Royal Society in 1841. The following year Fox Talbot received the Rumford Medal for his "discoveries and improvements in photography."*

Herschel's process consisted in coating a glass plate with silver chloride by subsidence. The details of the method, from Herschel's own notes, have been published by his son, Prof. Alexander Herschel.† By this means the old 40-foot telescope at Slough was photographed in 1839. By the kindness of Prof. Herschel, and with the sanction of the Science and Art Department, Herschel's original photographs have been sent here for your inspection. The process of coating a plate by allowing a precipitate to settle on it in a uniform film is, however, impracticable, and was not further developed by its illustrious discoverer. We must credit him, however, as being the first to use glass as a substratum. Herschel further discovered the important fact that while the chloride was very insensitive alone, its sensitiveness was greatly increased by washing it with a solution of silver nitrate. It is to Herschel, also, that we are indebted for the use of sodium thiosulphate as a fixing agent, as well as for many other discoveries in connection with photography, which are common matters of history.

Admitting the impracticability of the method of subsidence for producing a sensitive film, it is interesting to trace the subsequent development of the processes inaugurated about the year 1839. The first of photographic methods—the bitumen process of Niepce—survives at the present time, and is the basis of some of the most important of modern photo-mechanical printing processes. [Specimens illustrating photo-etching from Messrs. Waterlow and Sons exhibited.] The Daguerreotype process is now obsolete. As it left the hands of its inventor it was unsuited for portraiture, on account of the long exposure required. It is evident, moreover, that a picture on an opaque metallic plate is incapable of reproduction by printing through, so that in this respect the Talbotype possessed distinct advantages. This is one of the most important points in Fox Talbot's contributions to photography. He was the first to produce a transparent paper negative from which any number of positives could be obtained by printing through. The silver print of modern times is the lineal descendant of the Talbotype print. After forty year's use of glass as a substratum, we are going back to Fox Talbot's plan, and using thin, flexible films—not exactly of paper, but of an allied substance, celluloid. [Specimens of Talbotypes, lent by Mr. Crookes, exhibited, with celluloid negatives by the Eastman Company.]

If I interpret this fragment of history correctly, the founders of modern photography are the three men whose labours have been briefly sketched. The jubilee of last autumn marked a culminating point in the work of Niepce and Daguerre, and of Fox Talbot. The names of these three pioneers must go down to posterity as co-equal in the annals of scientific discovery. [Portraits by Mr. H. M. Elder shown.] The lecture theatre of the Royal Institution offers such tempting opportunities to the chronicler of the history of this wonderful art, that I must close this treatment of the subject by reminding myself that in selecting the present topic I had in view a statement of the ease of modern photography from its scientific side only. There is hardly any invention associated with the present century which has rendered more splendid services in every department of science. The physicist and chemist, the astronomer and geographer, the physiologist, pathologist, and anthropologist will all bear witness to the value of photography. The very first scientific application of Wedgwood's process was made here by the illustrious Thomas Young, when he impressed Newton's rings on paper moistened with silver nitrate, as described in his Bakerian lecture to the Royal Society on November 24th, 1803. Prof. Dewar has just placed in my hands the identical slide, with the Newton rings still visible, which he believes Young to have used in this classic experiment.

Our modern photographic processes depend upon chemical changes wrought by light on films of certain sensitive compounds. Bitumen, under this influence, becomes insoluble in hydrocarbon oils, as in the heliographic process of the elder Niepce. Gelatine mixed with potassium dichromate becomes insoluble in water on exposure to light, a property utilised in the photo-etching process introduced in 1852 by Fox Talbot, some of whose original etchings have been placed at my disposal by Mr. Crookes. [Shown.] Chromatised gelatine now plays a most important part in the autotype and many photo-mechanical processes. The salts of iron in the ferric condition undergo reduction to the ferrous state under the influence of light in contact with oxidisable organic compounds. The use of these iron salts is another of Sir John Herschel's contributions to photography (1842), the modern "blue print" and the beautiful platinotype being dependent on the photo-reducibility of these compounds. [Cyanotype print developed with ferricyanide.]

Of all the substances known to chemistry at the present time, the salts of silver are by far the most important in photography, on account of the extraordinary degree of sensitiveness to which they can be raised. The photographic image, with which it is my privilege to deal on this occasion, is that invisible impression produced by the action of light on a film of a silver haloid. Many methods of producing such films have been in practical use since the foundation of the art in 1839. All these depend on the double decomposition between a soluble chloride, bromide, or iodide, and silver nitrate, resulting in the formation of the silver haloid in a vehicle of some kind, such as albumen (Niepce de St. Victor, 1848), or collodion on glass, as made practicable by Scott Archer in 1851. For twenty years this collodion process was in universal use; its history and details of manipulation, its development into a dry plate process by Colonel Russell in 1861, and into an emulsion process by Bolton and Sayce in 1864, are facts familiar to every one.

(To be continued.)

* For these and other details relating to Fox Talbot's work, necessarily excluded for want of time, I am indebted to his son, Mr. C. H. Talbot, of Lacock Abbey.

† *Photog. Journ. and Trans. Photog. Soc.*, June 15th, 1872.

The Photographic Club.—The subject for discussion on Wednesday, July 23rd, will be "Ceramic Photography"; July 30th, "Printing with the Salts of Chromium." Bank Holiday outing to Guildford.

Mr. R. Harris, of Sydney, writes that, wishing for a pinhole camera, he extemporised one rapidly simply by pressing a piece of black wax into the smallest stop which he was in the habit of using with his ordinary lens, and then making a small hole in the centre of the wax with a pin.

THE PHOTOGRAPHIC CONVENTION AT CHESTER.

The Report of the Photographic Club Delegates.*

The fifth annual Photographic Convention of the United Kingdom was opened at the Town Hall, Chester, on June 23rd with a conversazione given by the Mayor of Chester. Certainly the reception was a most cordial and hospitable one, and it is flattering to note that, in the opinion of a local newspaper, well capable of forming an estimate, "never before had so much artistic skill been employed in the decoration of the main corridor of the building as was brought to bear on the present occasion." After the formal reception by the Mayor of the members of the Convention, the retiring president, Mr. Andrew Pringle, in the presence of the members and guests, introduced his successor, Mr. C. H. Bothamley, who, in the course of his most eloquent presidential address, while admitting that no discoveries or inventions of far-reaching importance had startled the photographic world, pointed out what minor advances have been made. With regard to photography in natural colours, there are differences of opinion as to whether the results of Herr Verescz, of Vienna, which, it is understood, are founded on the experiments of Carey Lea, are in advance of those of previous experimenters; at any rate, so far we can only say, that the direction in which the solution of the problem is to be looked for is not yet apparent. No marked advance had been made in orthochromatic photography, and the general adoption of such methods is impeded by, among other causes, the fact that the commercial products upon which many have to depend do not at present represent the maximum possibilities of the methods. The appreciation of eikonogen and the introduction of guaiacol as developers were alluded to. The application of photography to science, the president did not hesitate to say, is the direction in which photography has won, and probably will win, its greatest triumphs, and he instanced the remarkable astronomical photographs of Mr. Ainslie Common, F.R.S., and Mr. Isaac Roberts, F.R.S. On the other hand, he deplored the fact that the number of competent investigators, apart from experimenters, was very few indeed, and strongly advocated the cultivation of scientific method, which could only be inculcated by long and careful training. Turning to the art aspect of photography, he pointed out how we have advanced in our knowledge of science and art since Mr. P. G. Hamerton's well-known criticism of the claims of photography to rank as a fine art appeared in 1873 in the *Portfolio*, and he agreed with those who would fix a limit to subjects which may be considered to come within the legitimate scope of photographic treatment. Lastly, after alluding to the efficient school of photography at Berlin under Dr. Vogel, and the splendid institute at Vienna under Dr. Eder, he advocated the development of a desire for better training, and the provision of means to satisfy the desire. Whether this could be brought about by founding a photographic institute would depend on whether it is founded on a right basis and conducted on right lines; but, after all, the future of photography would depend on the work of individuals, and every one must see to it that his own work is honest and thorough, and the best that he can do.

Our minds having been thus strengthened, the remainder of the evening was, with a clear conscience, devoted to indulgence in the Mayor's hospitality, the admiration of lantern pictures illustrating former conventions, and to general sociability. The apparatus was scanned with attention, especially the splendid photo-micrographic instrument constructed for the Royal Veterinary College by Messrs. Swift.

Tuesday—a glorious photographic day—was well spent in excursions (1) to Little Moreton Hall, unfortunately in process of necessary repair, but one of the finest examples of half-timbered, moated mansions in the country; (2) to Llangollen, and by the valley of the Dee to Berwyn and Valley Crucis Abbey. The Photographic Club was well represented at both places, and you will no doubt see them fully illustrated. The first business of the evening was the presentation of the report of the Committee on Lens Standards, which was prefaced by a lucid explanation by Mr. Haddon of the means taken to arrive at a decision. The report recommends the adoption of the Photographic Society's Standards, with some few additions in the nature of amplification and explanation. It is satisfactory to note that there was no opposition expressed to the standard diaphragms, which, since they were first recommended, have been very extensively adopted, and now seem to be well established; but with regard to the flanges, it was evident that that portion of the report did not commend itself to those opticians who have been manufacturing lenses with mounts screwed to a different gauge, and who naturally consider the matter in the interest of those who use such lenses, and of which many thousands are stated to have been issued. In view of the fact that the decision of these opticians to abide by their own gauges had not been brought before nor considered by the committee, it was proposed and carried that the report be once more referred back to the committee, in order that they may confer on this point with the opticians and with the Photographic Society of Great Britain committee. The only point now in dispute is whether the standard flanges should be 1 inch, 1·5 inch, 1·25 inch, 1·75 inch, 2 inch, 2·25 inch, &c., with 24 threads to the inch, as recommended by the committee, or whether the 1·5 inch and the 2 inch should be superseded by the 1·52 inch with 32 threads, and the 2 inch with 30 threads at present in use. But whatever the final result may be, the Convention may fairly be congratulated on having aroused the opticians to a sense of the importance of coming to some agreement on this question, which is one that more or less affects all users of lenses.

Mr. Gambier Bolton, in his paper, "Animal Photography: Its Difficulties, Uses, and Abuses," told us of the trials he encountered in securing scientific and artistic qualities in zoo-photography; how he succeeded in giving, with the expenditure of from thirty to fifty plates, the exposure of two seconds, which was necessary to show the object in all its detail, on an animal which was never still for an instant. He considered that instantaneous exposures were of little or no use, and was severe on detective camera animal photographers, though he would admit the occasional use of a hand-camera with twin lenses. The perfect animal photograph should have had sufficient exposure to bring out all possible detail in the hair or feathers, and in the shadows; should be full of life, yet unrestrained; natural in position and expression (not as a man would look who had just sat down on the business end of a tin tack); all four legs and the tail should show distinctly, and the mane, if any; nostrils, ears, eyes, and the hairs round them should be microscopically sharp. He urged on photographers, especially those who travel, the importance of securing faithful, scientific, and artistic representations of birds or animals which are either rare or fast becoming extinct, and implored them not to waste plates on such childishly easy subjects as swans, deer, cattle, and sheep. Mr. Bolton then illustrated his paper by lantern pictures, first showing the kind of representation to be avoided if results of any permanent value were aspired to, and then his own pictures showing the way to do it. These proved to the satisfaction of his audience that the immense patience and perseverance he had exercised had not been in vain, and went far to justify his own estimate of their importance and scientific value.

The next paper was an important essay by Mr. Philip H. Newman, entitled "Imagining and Imaging," which proved to be an attack by an experienced art critic from the conventional standpoint on the doctrine and dogmas of Mr. P. H. Emerson, contained in his "Naturalistic Photography." It is comforting to find at the outset the rival combatants agree in paying tribute to photography as an art, and in admitting its claims to be a legitimate means of artistic expression. The combat seems mainly to resolve itself into one of mere words. Each sees individuality in Van Eyck's "Jean and Jeanne Arnolfini," though the one calls it conventionalism, while with the other it is the absence of that quality. Perhaps Mr. Newman's strongest point is where he charges Mr. Emerson with not permitting the freedom to others he takes himself, especially when he is taken at his word and his principles judged by his own works, though it must be observed that they can shake hands when treating of the expression of detail by photography, and pre-

* Read before the members of the Photographic Club, June 9th, 1890.

sumably also on the questiou of composite photographs, nothing belng said on this latter subject. As these two last are the points which have most agitated photographers, and as the treatment of historical aud mythological subjects is by common consent determined to be beyoud the range of legitimate photography, we, as spectators, canuot but feel that Mr. Emerson's positiou is, on the whole, not materially weakened by this clever onslaught.

The annual meeting of the members was held on Wednesday morning, when it was resolved that the next Convention (1891) be held at Bath. It having been generally felt that provincial members should, in the interests of the Convention, be more largely represeuted on the council, an alteration of rules was made to the effect that the council shall consist of forty members, of whom not more than twenty shall be London members, and five members from the locality where the Convention shall be held in the following year. Power was also given to alter or amend the rules at any special general meeting called for the purpose. In spite of the rain, most of the members proceeded by steamboats up the river Dee to Eaton Hall, where they assembled on the terrace and were successfully photographed, in the face of the adverse conditions which still prevailed, by Mr. Watmough Webster. In the evening the President (Mr. Bothamley) explained that the detailed results of his receut experiments with rhodamin would be deferred until they are more complete than he has at preseut had time to make them. Mr. Paul Lange then gave an interestiug account of a recent visit to Norway, interspersing it with valuable hints to intending visitors, and illustrating it by a number of fine lantern pictures taken with a hand-camera.

On Thursday the excursious were to Couway and up the valley of the Conway River as far as Llanrwst aud Trefriw. The weather during the day was all that could be wished, and your delegates deterumined to join the Trefriw party. Each started with the impression that the other had found salvation through Mr. Gambier Bolton, F.Z.S. Imagine, therefore, their mutual surprise when, easting away their crowns, they found themselves childishly hurrying after a trivial group of cattle, which they suddenly resolved to image. This trip into North Wales involved the loss of the evening's papers, the first being the report of the Committee ou Weights and Measures drawn up by the president. The feature of the report is that it recommends, in dealing with formulæ, "a method which is independent of the system of weights and measures used, provided that the relation of the unit of weight to the uuit of measure is the same as that which exists between the gramme and the cubic centimetre, or the ounce and the fluid ounce." It is recommended that formulæ should give the number of parts of the constituents by weight or measure, to be contained in some definite number of parts by measure of the solution. The mixture can then be made up according to the unit selected, either in (1) grammes and cubic centimetres, or (2) graius and fluid grains, or (3) ounces and fluid ounces. The report, we understand, was well received, and, without dissent, adopted.

Mr. Andrew Pringle's "Record of Photo-micography" pointed out the difficulties that had been encountered in rendering baeteria ou account of their colour. This difficulty had led more than one eminent bacteriologist to abandon the use of photography for the purpose ; colour-correct photography, however, is now removing this stumbling block of the earlier workers. Reviewing the optics of the subject, he pointed out the advantages derived from the immersion system, and from the later Zeiss objectives, aud looked for the time when every candid investigator would employ photography, the ouly scientific method of delineation.

Mr. Friese Greene's paper, "Suggestions," was, at his desire, taken as read. He exhibited his magazine camera ; but, owing to some hitch in the optical arrangement, he was unable to show the results on the screen to his satisfaction.

On Friday mauy of the members might have been seen with their cameras busily securing reminiscences of Chester architecture, ancient and modern, the projected excursion to Liverpool beiug evidently considered less attractive. Later in the day Hawarden Castle was the object of attraction.

The annual dinner at the Grosvenor Hotel, at which about sixty members were present, happily completed the programme.

The Chester Conveutiou of 1890 was thus practically brought to an end, and although, perhaps, the number of members from the Chester district was uot so large as might have been desired, there was no question as to the success of the meeting. All who did attend, we cannot but feel are considerable gainers both meutally and physically. It is one thing to attend such a meeting and have the events indelibly impressed on the memory; it is quite another thiug to read or, perchance, merely skim the papers as they appear in the journals, or to listen to such an imperfect report as can be brought before you on an occasion like the present. It is good to be in a position to exercise our own iudividual judgment on the interesting matter put forward for consideration, and thus to bring our influence to bear to direct the future course of the development of what, at present, are little more than the germs of photographic knowledge. In photography less, perhaps, than in most other pursuits, can any one afford to take up an entirely independent position. Each must recognise the principle of inter-dependence, and it is for these reasons that we would urge you to support the Convention, seeing that it has no other aim or claim to encouragement than in so far as it tends to advance the interests of our chosen occupation.

WILLIAM BEDFORD }
R. P. DRAGE } *Delegates.*

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

THE hon. sec. to the Photographic Society, Captain A. M. Mantell, R.E., announces that the next Exhibition of the Society will be inaugurated by a conversazione, open to members and their friends, at 8 p.m., on Saturday evening, the 27th of September, and that the Exhibition will remain open daily (Sundays excepted) from Monday, the 29th September, until Wednesday, the 12th of November; admission (from 10 a.m. till 5 p.m.) one shilling. It will also be open every Monday, Wednesday, and Saturday evening; admission (from 7 to 10 p.m.) sixpence. Members have free admission at any time, and will be supplied with tickets to admit their friends.

Medals will be placed at the disposal of the judges for artistic, scientific, and technical excellence of photographs, and for lantern transparencies and apparatus, and the following are the judges: Capt. Abney, R.E., C.B., D.C.L., F.R.S., Valentine Blanchard, W. England, J. Gale, Henry Moore, A.R.A., H. P. Robinson.

A copy of the regulations may be obtained on application to the assistant-secretary.

Foreign exhibitors are specially invited to contribute. The Society will pay the carriage of photographs one way, and provide frames during the exhibition for photographs approved by the judges. There will be no charge for wall space. Exhibits sent in packing cases (carriage paid) must be addressed to the "Photographic Society of Great Britain," care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London. Packing-cases must arrive not later than Monday, September 15th ; they will be too late if received after that date. No packing-cases can be received at the Gallery. Exhibits (including pictures, negatives, transparencies, lantern slides, apparatus and appliances) sent by hand will be received at the Gallery, 5A, Pall Mall East, on Monday only, September 15th, until 9 p.m. Delay will prevent exhibits coming under the inspection of the judges.

Lantern transparencies sent in competition for a medal, not less than six, should be fitted (removable) in a frame

to stand upon the table, and it is desirable that duplicates be sent for exhibition in the optical lantern. They will only be eligible for award when both the negatives and slides are the work of the exhibitor. Photographic lantern slides will be shown with the Society's optical lantern during the Exhibition. The loan of slides for this purpose is invited; they must not exceed 3¼ inches in height, and, to enable the committee to select and arrange them, must be delivered at the Gallery not less than one week before the evening of their being shown in the lantern.

It is to be distinctly understood that the sending of exhibits signifies acceptance by the exhibitor of the decision of the council upon all matters connected with the Exhibition as absolute and final. The council do not hold themselves responsible for any damage that may happen to the pictures or other exhibits whilst in their custody, but they will take every precaution to insure their safety and prompt return to the owners at the close of the Exhibition. To avoid damage to frames, exhibitors are requested to have sunk backboards to their frames, with the fastening nails not projecting, and the whole covered with thick brown paper. The regulations as to the removal of exhibits can be had on application to the assistant-secretary, Mr. Edwin Cocking, 5A, Pall Mall East, London, S.W.

UNIFORMITY IN LENS MOUNTS.

Considerable interest is now being manifested in England in regard to an uniform system of mounting lenses, to be adopted by the different lens makers. For many years the microscopists have had the comfort and great advantage of the so-called society screw for their objectives. This society screw has a thread which is of such a character that an objective bought of any maker will always fit upon the tube of a microscope already fitted with objectives made with this screw. As a consequence, no extra fittings or adapters are necessary, and every microscopist can use a lens of any other maker than the one he already possesses, without having to make special changes for the purpose.

This same idea is now being discussed in regard to photographic lenses. It is argued that all photographic objectives of the same lens diameter, or even slightly smaller, could be fitted in mounts having screw-threads working into the same flanges for all makers. At the present time even lenses of the same diameter will not fit into the flange if they are made by different opticians. What a comfort and convenience it would be if all lenses, say from 6½ by 8½ down, had screws that fitted into one flange, and that every make of lens of these sizes, 6½ by 8½, 5 by 8, 5 by 7, 4¼ by 6½, and 4 by 5, could all be used with one flange. At the present time, if one wishes to use a different size of lens within the above limits, there are only two clumsy and troublesome methods available. First, to have as many separate front boards fitted to your camera as there are lenses you wish to use with it; or second, to use a series of brass adapters, one for each lens available for the camera. The first method is clumsy in the extreme, the extra front boards always being in the way when packing the lenses for transportation or storing them for safe keeping. The second method, while less objectionable than the first, is very expensive and troublesome after the adapters have been made. What is wanted is a series of screw-threads of such a standard character that every lens maker can use them, and with one screw for a series of lenses. Of course it would be out of the question to have one mount for all lenses. But two or three lenses, that differ only slightly in diameter, could be fitted with threads that all screw into the same flange. For example, lenses covering 11 by 14, 10 by 12, and 8 by 10 plates could all be made to fit into a flange that carries an 11 by 14 lens tube; and lenses that are smaller than 6½ by 8½ could all be fitted with threads to fit into a 6½ by 8½ flange. Perhaps these might be divided differently, and the 8 by 10 and lower sizes could be separated into two groups; but this is a matter of detail for the opticians. What we need is a series of screw threads and flanges so arranged that several lenses of nearly the same size will fit one flange, and every lens of the same size made by different opticians will fit the same flange.

Yet another source of annoyance, especially to the travelling photographer, is the tripod screw. Up to the present time there seems to be no easy method of securing the camera upon the tripod except the screw, and every camera manufacturer seems to take a special delight in making every new camera box with a new plate having a thread that is different from every other tripod screw ever before made, and especially different from that of any other maker. There are no other manufacturers using screws that have such an apparently unnecessary diversity of those exceedingly useful means of securing parts of apparatus together. And the time has come when those who will pay attention to these matters and the wants and needs of those that use their wares, will succeed and prosper, while those who do not will most certainly be ignored.

What we need is uniformity in the mechanical parts of photographic apparatus, uniform and simple lens mounts, uniform and correct diaphragms, and uniform tripod screws. And we are very glad to note that such men as Dallmeyer, Ross, Beck, and others are trying to come to some agreement in the matter as far as lenses are concerned. We also hope that American opticians will see that it is to their interest also to take the same action and let us have an international system.—*Anthony's Photographic Bulletin.*

Non-actinic White Light.—Dr. E. Liesegang says, in the *Photo Archiv*, as translated for *Wilson's Magazine*, "The expedient of covering a window with a fluorescent solution of quinine sulphate has not proved sufficient to keep out all actinic rays. This is better accomplished thus:—It is known that an aqueous solution of three parts green chloride of nickel, and one part red chloride of cobalt, is colourless by transmitted light, and quite clear when dilute. The two colours are complementary, and completely neutralize each other. Hence the light passing through the mixed solution has no effect on the salts of silver. Although it is quite white it is perfectly non-actinic, and does not any longer affect the sensitive film. To completely neutralize any possible rays in the ultra-violet, another glass is coated with a solution of quinine sulphate in collodion somewhat acidified with sulphuric acid. The quinine cannot be used in the same solution because it is precipitated by the cobalt salt. As the cobalt chloride, red when containing water, becomes blue when free from it, the mixture must not be allowed to dry. It may be made with gelatine and glycerine, but even a high temperature around the window may dry it. Silver paper which was left exposed for a week behind a thin layer of the cobalt-nickel solution thus prepared, did not show the slightest alteration. I have not as yet experimented with plates, but with sufficiently concentrated solution these also should not suffer change."

PHOTOGRAPHIC ESTABLISHMENTS.

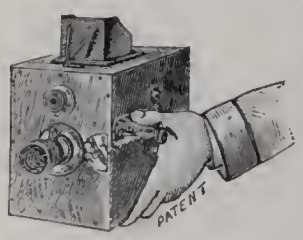
THE London Stereoscopic Co. invited newspaper repretatives and others to visit their new premises at 106, Regent Street, London, last Monday. At the top of the premises they have a special studio for those who will give any amount of time for the obtaining a likeness with the best possible resnlts. It has none of the artificial furniture sometimes used in studios, and is intended for those who will give the photographer a fair opportunity of doing the highest work, without taking turn in a hurried manner with a waiting crowd of sitters, and who will remnnerate him accordingly.

In the developing rooms they have the electric light with glow lamps, and two-way switches for obtaining light from the lanterns or for illuminating the room at will.

In one of the dark rooms is a little piece of apparatus by Mr. Fletcher, for obtaining nearly boiling water in five minutes, or less warm water in a shorter time. The chief merits of it are, that it is of small compass, and all the parts are under the observation and within the reach of the possessor, so that if any parts get out of order they are not boxed up so as not to be available for immediate repair.

With one of the cameras on the premises the operators can take portraits measuring 30 inches by 24 inches direct.

A novelty, just introdnced by the Company, is a quarter-plate "artists' camera," measuring exteriorly 6 inches by 5 inches by 4½ inches, strongly made, so that it looks as if it might stand a kick anywhere without damage. The lens works at $f/5\frac{1}{2}$; it has a large finder, and a shutter to give varions speeds at will. They have also a new camera with twin lenses for stereoscopic work, and photographs taken with it were exhibited at the Photographic Convention at Chester by Mr. Gambier Bolton.



Mr. Edgar Clifton has charge of the amatenr-teaching branch of the bnsiness, and we hope that he will write a book abont his experiences. Mr. Humphreys is in charge of the business section of the amatenr department. The Company has been awarded a certificate of merit by Ally Sloper.

Mr. Friese Greene has just opened new stndios at 162, Sloane Street, London, and a day or two ago invited the press and others to inspect them. Afternoon tea was served and carried round among the guests by two waiters dressed as English gentlemen of the Garrick period, with powdered hair and everything complete. The varions storeys of the bnilding are fitted up in artistic style, and Mr. Greene advertises that they are "open as an exhibition and a lonnge between the honrs of three and five."

He has a good artist in oils constantly engaged upon the premises—Miss Kate Pragnell, who is well known in Bath and the West of England, who recently illustrated the catalogue of paintings in the great private collection of Sir Greville Smith, of Ashton Court, Clifton. Her photographic colouring is executed in snbdned colonrs, and with artistic skill. She says that she finds that celluloid will not bear loading with oil colours, also that Mr. Greene's opal cards will bear such treatment; this resnlts in the exhibition of two classes of coloured photographs.

A SUPPLEMENT TO THE "PHOTOGRAPHIC NEWS."

ON the sixteenth of August we shall issue as a supplement a highly artistic photo-etching of the house of the late Charles Kingsley, at Eversley, photographed from a painting. As this jonrnal is usually kept by its subscribers for binding, we recommend them not to part with their copies until they are snre that they can get others.

Correspondence.

WEIGHTS, MEASURES, AND FORMULÆ.

SIR,—In your issue of the 11th inst. Mr. Warnerke inveighs against the report of the Convention committee on weights, measures, and formulæ, and since his letter is a most extraordinary, though doubtless unintentional, misrepresentation of the report, I will ask you to allow me to reply.

Mr. Warnerke says: "We learn (what was not generally known) that the apothecaries' ounce of 480 grains, after all, is not legal, and that the legal one of 437·5 grains is divided into 480 parts, which greatly increases the already inextricable chaos." Why "after all"? The avoirdupois ounce of 437·5 grains has been the only legal ounce for ordinary buying and selling in this country for many years; no special apothecaries' ounce has been included in the *British Pharmacopœia*, at any rate since 1864, and if these facts were not generally known to photographers, they were, of course, well known to everyone really acquainted with the English systems of weights and measures. How can a state of things which has existed for more than a quarter of a century fairly be said to "greatly increase" anything at this time of day, and is it not desirable that, in discussing a scientific question, we should avoid applying such extravagant terms as "inextricable chaos" to the comparatively simple problem of distinguishing between an avoirdupois ounce and a troy ounce, a gram and a minim? Mr. Warnerke obviously does not fully recognise the difference between the mode of division of the ounce and that of the fluid ounce.

We never said that the metric system was exclusively used for scientific purposes, because that would not be true. In certain branches of applied science the English units are constantly used.

We are charged with throwing a gratuitous insult at the heads of thousands by stating that photographers are not intelligent enough to understand the metric system! We never said anything of the kind. We did state that "a knowledge of decimals sufficient to enable a decimal system to be used easily and accurately is by no means so widely diffused as is desirable," but that is a very different thing from what we are asserted to have said. The statement is unfortunately quite true; we did not make it without first being sure that it was in accordance with the facts; and we did not limit it to photographers, because it applies to all sorts and conditions of men.

We are also charged with trying to impose on photographers two systems of weights and measures, "the metric, and a modified one, in which ounces and grains differ from the old ones (they are divided into decimal parts) forgetting that 'photographers do not possess the knowledge of decimals sufficient to enable a decimal system to be used easily and accurately.'" In the first place, Mr. Warnerke puts between inverted commas, and passes off as a sentence from our report, a statement which does not occur in it at all. In the second place, the ounces and grains which we speak of are not new; they are the same ounces and grains that we have been using for years and years. Neither is the use of decimal parts of grains and ounces in any way a novelty; it has been the practice in many chemical laboratories, and with some photographers for a long time. Surely Mr. Warnerke does not share the common misbelief that a decimal system is inseparable from the metric system, and that metric units are the only units which can be or are used decimally? Finally, in

this connection, we make no attempt to impose any units on anybody; we recommend no new units. We do recommend that certain sub-units in fluid measure should *not* be employed; and we endeavour to show how well established and familiar units can be used in the simplest and most intelligible manner.

Mr. Warnerke's grievance against us, obviously, is that we did not insist on the adoption of the metric system pure and simple. Several of us, like many other scientific men, whilst fully recognising the advantages of a decimal system, are by no means so enamoured of the metric units as Mr. Warnerke seems to be. The committee endeavoured to recommend a scheme which should, in the first place, be practicable, and in the second, likely to secure general adoption.

We regard our recommendations relating to formulæ as the most important part of our report. It seemed to us to be undesirable to insist upon the adoption of any particular units, and it is quite of secondary importance whether any individual chooses to use in his own practice ounces, or grains, or grammes, so long as his units satisfy the condition of relation between weight and measure which we specify, and provided always that he expresses his quantities or formulæ in "parts" when he wishes to communicate them to others. The fact that our recommendations as to formulæ are quite independent of the particular units employed seemed to us to be one of their strongest claims to general favour and acceptance.

The whole of the concluding and longest paragraph of Mr. Warnerke's letter has very little bearing on the question under discussion; it certainly has no foundation on anything contained in the report of the Convention committee.

C. H. Bothamley.

AN ELECTROSCOPIC MIRROR.

Sir,—An experimenter has seen occasion to arrive at the conclusion that, under certain attainable conditions, and by the employment of a conducting wire of a selected metal—the same to be *flattened out at each end into a highly-polished mirror-surface*—it becomes possible to transmit to a distant station the perfect image of any face, picture, or document thrown, under a proper arrangement of light, upon the transmitter. This may, possibly, be true; but it remains to be demonstrated. ———.

Clifton.

[Because of a pencil note on the original, we are not sure whether the writer intended this to be published with his name attached, so omit his name.—Ed.]

EALING PHOTOGRAPHIC SOCIETY.

Sir,—A meeting of the above Society will be held at the Victoria Hall, Ealing, on Thursday, the 24th inst., at 8 p.m., to approve the rules, enrol members, and elect officers for the year. I am instructed by the provisional committee to invite the attentance on that occasion of all those who are interested in the subject. H. W. Peal.

2, *Craven Terrace, Ealing, W., July 15th.*

German Amateurs.—A German amateur states that he has made excellent portrait photographs in his garden, even in high winds and on rainy days, by using a large white umbrella, such as is used in out-door sketching, to control the light and act as a curtain. He also uses a reflecting-screen made of light muslin, stretched upon a rigid wooden frame. One of the worst stories yet of the budding amateur is told by a German journal. The youth in question wanted some 9 by 12 cm. plates. The dealer to whom he went, having none in stock, gave him a package of the next larger size, telling him he could cut them down to suit—this, by the way, is also somewhat characteristic. The amateur forthwith went off to a neighbouring glazier's shop, unwrapped his plates, and had them cut down to the proper dimensions in the ordinary daylight of the shop. He then repacked them, took them home, and filled his plate-holders in his dark room. Strange to say, those plates turned out almost the worst cases of fog he had ever seen.—*Wilson's Photographic Magazine.*

Proceedings of Societies.

London and Provincial Photographic Association.

At the weekly meeting on the 10th inst. Mr. T. E. Freshwater occupied the chair.

Details of a lantern slide competition to be held during the lantern season were discussed. It was decided that the conditions of the competition should be similar to those of the last one held, three negatives to be selected, each competitor to have them in turn. The slides may be made by any process, one set of slides from each competitor to be an exact reproduction of the negative, without dodging, or masking, or addition of skies.

At the request of the members, Mr. A. Cowan promised to bring some quarter-plate negatives to the next meeting for selection.

A member said that after toning, fixing, and washing prints on gelatine paper, in some instances the surface of the prints became very tacky, and if touched a part of the image would adhere to the fingers. Could any member state the cause of this?

Mr. A. Cowan suggested as a remedy putting the prints in an alum bath for a short time.

Mr. H. M. Hastings showed two prints on Hardcastle's platinum paper printed out.

Replying to a query whether drying negatives with alcohol increased their density, Mr. J. J. Briginshaw said that some time ago Mr. A. L. Henderson showed some results of experiments he had made, which proved the affirmative.

Mr. W. E. Debenham said drying negatives quickly with heat would have a tendency to increase their density.

Mr. W. H. Harrison described a simple photo-mechanical process for printing coloured designs. Orthochromatic plates are used, and an exposure made to suit each colour; the remainder of the design on each plate is then blocked out and the negative printed on a collotype plate. A separate plate is used for each colour in the design.

The subject for discussion on the 24th will be "Printing through Coloured Media."

Photographers' Benevolent Association.

A committee meeting was held at 4, Great James' Street, Bedford Row, on the 11th inst., Mr. W. Bedford chairman. Messrs. R. P. Drage, G. C. Audsley, and P. J. W. Wapp were elected members. Votes of thanks were passed to the Mayor of Chester for allowing the boxes to be placed in the Town Hall, also to Mr. Briginshaw for his kind help. A vote of condolence to Mrs. T. J. Collins was passed on the death of her husband, who had always been to the fore in helping the Association, of which he was the deputy-chairman. The money collected at the convention was £2 1s. 7½d. The committee trust that employers requiring assistants will write to the hon. sec., as there are numerous persons on the books requiring situations.

Croydon Camera Club.

On Thursday, July 10th, a meeting was held at the Public Hall, Mr. G. R. White in the chair. A vote of thanks was accorded to Mr. A. H. Smee for allowing the members to have an excursion to his estate at Wallington.

The Secretary read a financial statement showing that the affairs of this young Club are in a highly satisfactory condition.

Mr. De Clercq notified the council's views and decision in reference to acquiring a permanent home for the C. C. C. From his statement it appeared that the council had in contemplation the acquisition of premises situated at 56, George Street, Croydon, as being in every way suitable for the purpose.

The Secretary proposed and Mr. Cheshire seconded a resolution approving the decision of the council. After a few remarks in favour of the scheme by Mr. Alfred Underhill, the assistant secretary, the resolution was carried unanimously, and the Secretary was authorised to call a special general meeting on July 16th to take possession of the rooms.

The premises consist of one large room which will be used

as a club room for meetings, demonstrations, and lantern exhibitions; there are two smaller rooms, one of which will be used as a store room, and the other as a dark room fitted with every convenience and appliance. The council will allow the club to be used by tourists, cyclists, and others.

The assistant secretary (Mr. A. Underhill, 23A, Clarendou Road, Croydon) will be glad to receive the names of candidates who intend joining, or to give any required information.

HACKNEY PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held on Thursday, July 10th, at Morley Hall; the chair was occupied by Mr. C. F. HODGES.

The SECRETARY reminded members that the monthly outing would be on the 19th, that a competition would be held in November, and that Messrs. H. P. Robinson and J. Traill Taylor had consented to act as judges.

Mr. CARPENTER handed round some negatives which had holes iu the films.

Mr. ACRES said that they were air-bells, arising iu development.

Mr. HODGES said he had found that with rapid exposures he was troubled with them.

Mr. ACRES said that it was through the developer being too strong.

Mr. BIRT ACRES then read a paper on "Exposure and Development." He said that he did not altogether agree with exposure tables, and explained that exposures varied, and gave as an exaunple the angle of 45°, when the exposure would be increased one half, and if at right angles it would be trebled. The lecturer advocated the backing of plates with either burnt sienna or Bates' black. He preferred dull weather when photographing on glass. Some people complained of not beiug able to develop isochromatic plates through their foggging by red light. Mr. Acres said the fogging was geuerally caused when the plate was held up to the light. He made two very interesting experiments, one of which was as follows: Taking an isochromatic plate, he made a positive by exposing the negative for thirty seconds to the ruby light of the screened candle; the result was an exposure. The other experiment was that the development was carried on by white light, the only change being that he held the developing dish above the light. There was no fogging with either of these plates.

Various questions were asked by Messrs. Hodges, Heusler, Capel, Poulson, and the Secretary, to which Mr. Acres said that soure makers would back their plates if a sufficient number were ordered, that plates ranged generally from 16 to 25 on the sensitometer, and that he preferred as large a stop as compatible with good definition.

DR. LIESEGANG, in *Photo. Archiv*, states that he has utilised the known fact that the sensitiveness of silver salts is affected by pressure in making prints. Any relief, such as a Woodbury-type on glass, is pressed upon the paper under a sheet of glass. Naturally the highest parts of the relief make the strongest impressiou, the paper under them becomes less sensitive, and on exposure to light a negative of the subject is obtained.

FLASH-POWDER.—We learn from our exchauges that a new flash-powder has been worked out by Dr. James Taylor, of the United States Department of Agriculture, which is obtained from the down of the milk weed couverted into charcoal, and which is said to be almost entirely free from ash, aud to burn with a remarkable freedom and rapidity, and it is expected that this new substauce uay largely supersede many of the daugerous flash compounds now in use.—*Anthony's Bulletin.*

RECEIVED.—The first number of "The Gentlewoman," an illustrated journal. Under the heading "Art and Artists," is chronicled what is called "another artistic advauce iu photography," and the following are the terms in which it is spoken of:—"Mr. Vanderweyde is now producing what he terms 'Diaphanous Effects' in his new daylight studio, which apartment is built on entirely new principles as an addition to his famous electric light studios in Regent Street. Mr. Vanderweyde secures, under the most novel conditious of lighting by means of patented appliances, a subtle atmospheric and truly diaphanous effect never before attained. The results are extremely beautiful and artistic, and this new invention lends tself most delightfully to portraits of ladies and childreu."

Answers to Correspondents.

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

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

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

W. D. B.—*Preparation of the Nitrate from Old Silver.* There are two methods of working: either to evaporate the mixed nitrates to dryness, and heat to incipient fusion, whereby the copper salt becomes decomposed, and converted into the insoluble black oxide; or throw down the silver as chloride, wash until free from copper, and reduce to pure metal by fusiug the dried chloride with three times its weight of dry carbonate of soda. If you intend to use the nitrate of silver only for printing, the first plan will be found to answer; but, for the better purposes, it is always safer to go the length of purifying the silver in the way mentioned, and then dissolve this again in pure nitric acid.

E. O. C. (Boston, U.S.A.).—*The Photogravure Process.* Dr. Gunther, in his letter of the 20th of Juue, was merely quoting from the two German periodicals, *Deutsche Photographen Zeitung* (Berlin), and *Photographische Correspondenz* (Vienna), the first containiug a practical article by E. Kiewning, and the latter one by Rudolf Maschek. Both of these separate numbers can be obtained by applying to their respective publishers. Mr. W. T. Wilkinson's manual is out of priut just now; enquire of Messrs. Eugland Brothers, Charles Street, Notting Hill, London, W., for a new edition is said to be in the press; but a brief report of Mr. Wilkinson's mode of working the photogravure process was published in the NEWS of March 28th last, page 237.

G. F. W. (Erith).—*Alpha Paper Developer.* Without experimental trial it is difficult to give an eikonogen equivalent for the ferrous oxalate developer you now use. You speak of the "complication" of formulæ in cubic centimetres and grammes, but nothing can be simpler, remembering that one c.c. of water weighs a gramme. Take them as *parts or units* by weight and measure, and then all will go right, whether the English or Continental system be adopted.

J. W. (Leeds).—*Seed's Developer for Dry Plates.* This was given in the NEWS of March 15th, 1889, top of page 170, as follows:—

No. 1.—Sulphite of soda	...	...	...	1 ounce
Water	...	...	...	8 ounces
No. 2.—Carbonate of soda	...	...	...	1 ounce
Water	...	...	...	8 ounces

Normal developer, No. 1, $1\frac{3}{4}$ ounce; No. 2, $\frac{1}{4}$ ounce; pyro, dry, 4 grains.

H. H. B.—(Reading).—*Toning of Aristotype Paper.* Your difficulties are increased by the unscientific practice of toning and fixing in the same bath. Why not separate these processes, using a borax or sulpho-cyanide toning bath, and fixing with hypo as usual? We have heard several complaints of late about the muddy tones given by some samples of this paper, but treated as proposed the defects may be to a cousiderable extent obviated. See Mr. H. O. Hughes's article in the YEAR-BOOK, page 111.

L. N.—*Fixing Prints with Chloride of Magnesium.* The strength of solution does not appear to be a matter of very great consequence, provided that enough is employed to dissolve out all the chloride of silver. We have searched the journals for several months without finding any specific formula for a fixing bath made with this new agent. Probably two baths in succession would be best.

M. P. S.—*Judges at the Forthcoming Exhibition.* From the list of persons nominated, we were led to infer that the Royal Academicians would be in the majority; but with Mr. Henry Moore in association with six of the most talented art-photographers of the day, we may still say that it would be impossible to empanel a better jury.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1664.—*July* 25, 1890.

CONTENTS.

PERMANENT HISTORICAL PHOTOGRAPHS.

THE production of small photographs for historical purposes in such a manner that they are likely to resist the attacks of deteriorating influences for centuries, is a problem which well deserves the attention of the photographic world. Many years ago we gave a considerable amount of attention to the problem, and came to the conclusion that one good method was to cement with heat a collodion transparency between two plates of glass, by means of a resinous substance not likely to crack or otherwise deteriorate with lapse of time. In short, the idea was to preserve the photographic film like a fly in amber, and between two sheets of glass. The insects found in amber lived ages ago, and most of them belong to now extinct species. In those early times many an unfortunate insect, while crawling upon a hot day beneath the shade of certain pine trees, particularly the *pinites succinifer*, found itself entombed for ever in a mass of resin which had fallen from above as an exudation from the tree. The essential oil in the resin slowly evaporated in course of time, the resin itself hardened correspondingly, and the body of the insect became so protected from the ravages of time as to be preserved through geological periods.

On this principle we once set to work to make a kind of artificial amber so far as properties were concerned, that is to say, a transparent, resinous cement, free from volatile oil. A sample of pure and old Canada balsam was taken, and placed for several days in an oven with the door open, to slowly drive off the essential oil without the application of much heat; it was stirred occasionally during the operation. Afterwards a few drops of castor oil were added to the melted balsam, and well stirred in; care was taken not to add too much castor oil, otherwise the mixture would not have become sufficiently hard when cold. When the proportions—which must be discovered by the system of trial and error—are nicely adjusted, the mixture when cold is somewhat tough, and not so brittle as amber. Castor oil is not a volatile oil, and may almost be classed with the drying oils, for after the lapse of great length of time a thin layer of it will dry into a film. The mixture just described is virtually a tough resin, practically free from volatile matter.

A plate of iron, with short, firm legs and some minute gas jets a little below it, was then taken, and some sheets of smooth blotting-paper laid thereon, so that the transparency should not come into direct contact with the hot iron. The heat was regulated by means of small taps governing the gas flames; too much heat discoloured the resinous mixture, and gave the transparencies a yellow tinge. The transparency was laid face upwards on the blotting-paper, and when it became sufficiently hot some of the melted prepared balsam was dropped upon it; the warmed covering glass was then laid upon the balsam, and the excess of the latter worked out at the edges of the two plates by means of thickly gloved fingers. Air bubbles were troublesome, but with patience could be worked out; this was all the more practicable because plates larger than the lantern slide size were not employed. Uneven glass was troublesome and sometimes useless for the purpose; patent plate, or other glass with a truly plane surface, should alone be used.

The hot iron arrangement was not a good one for working always at uniform temperature, or for yielding a steady heat. A better plan would be to use a brazed rectangular vessel of copper, filled with olive oil and with gas jets beneath; a thermometer with its stem projecting from the oil bath would serve as a guide to the temperature, and the manipulations should be performed on the upper copper surface of the bath.

The operations already described were performed by us about a quarter of a century ago, in the old collodion days, and the various portraits—heads and busts only—thus preserved were altogether unchanged, so far as memory could be trusted, when we saw them last, upon turning out the contents of an old box a year or two back. One of the portraits thus preserved was that of Faraday, and it is probably the most life-

like and interesting one of him at present in existence; another was a likeness—and not a flattering one—of Professor Tyndall. The two collodion transparencies were originally obtained from two professional photographers, who furnished them to us at the request of Professor Tyndall.

When Mr. York photographed the last of the quaggas, little did he think that he was earning immortality for his name, and causing it to be emblazoned for ever in the annals of zoological science, just as would have been the case with another man had that other person been the only one to photograph the last living dodo. Mr. York has five negatives of the quagga, and it is desirable that positives from them should be made as soon and as perfectly as possible by the most permanent process available, and one yielding abundance of delicate detail. On considering these points, it will be seen that much is to be said in favour of the method just described, and that it is one which deserves the attention of the historian and the antiquarian.

Some microscopic slides cemented with Canada balsam are found to lose their covering glasses by the balsam hardening and allowing the glasses to chip off. The process of cementing lenses, photographs, and so on by means of Canada balsam and castor oil is as old as the hills, and we are told that the ready-prepared transparent cement can be had in the market. For historical purposes, however, it is essential that the photographer shall conscientiously make the cement himself at the lowest suitable temperature from the best materials, and shall take care that all the volatile oil has been driven off; he must also take care that enough castor oil is employed to guard against an adverse amount of brittleness. The arborescent markings which sometimes appear between cemented lenses are due to a residuum of volatile oil in the cement used, which oil evaporates in course of time after the cementing.

The Convention at Washington.—The Photographers' Association of America will hold its annual convention at the Smithsonian Institute, Washington, August 12th to 15th inclusive. The grand prize is offered for the best print from a negative suggested by Tennyson's "Enoch Arden." During the convention week the memorial to Dagnerre will be unveiled.

Matting Lantern Slides.—A trustworthy universal form for cutting out openings of various sizes and shapes in slide mats is still a desideratum, notwithstanding the fact that there are one or two mat-trimmers in the market. Without wishing to reflect upon their usefulness, we may express the wish that some ingenious amateur would give us some better way. A fairly satisfactory method is to keep a stock of strips of thin black paper of various widths, and to gum these to the face of the slide as the subject may require, care being taken to make perfectly square corners. Another method, which does away with the square corners, objectionable to many, is to cut a piece of thin, hard card-board to the size and shape of the opening, and bend it over squarely across the middle. The mat paper is cut to size, folded across the middle, and placed between the two halves of the doubled card-board, which acts as a clamp. The opening is easily cut out with a pair of sharp scissors. Cards of various sizes and shapes are easily made, or thin sheet brass may be used.—*American Amateur Photographer.*

PHOTOGRAPHIC GRUMBLERS.

There are some men who are never content with their surroundings, and seem to have a notion that their fellow-creatures, and the universe generally, are in conspiracy against them, in order to render all their schemes abortive. It is, of course, natural that photography should have among its votaries a few men of this kind, although it is a misfortune to them that they ever undertook the business or pastime of picture-making with a camera; for this art of ours is full of pitfalls and quicksands of trouble and disappointment, and unless the worker be of easy temperament he will most surely quarrel with it, and attribute his want of success to everything but the true cause.

It so happened that a few weeks ago we had the opportunity of spending some time in the company of one of these grumblers, and we were certainly amused at the way in which he met every little trivial occurrence as if it were a foregone conclusion, and one which had been especially prepared for his discomfiture. We reminded him of the well-known lines:—

"The best laid scheme o' mice and men
Gaug aft a-gley,"

and told him that it was silly to make so much of trivial misfortunes; but he replied in a despondent tone, and although he did not actually say that

"From childhood's hour
I've seen my fondest hopes decay,"

he looked it, and evidently meant it. As there may be others among our photographic friends who occasionally allow despondent thoughts (and their livers) to get the better of them, we have thought it worth while to dot down some of the complaints of our dyspeptic friend, in order that they may see how ridiculous such complaints appear to be when "made a note of."

The weather naturally furnishes the greatest amount of matter for grumbling about, and if our friend had confined his vituperations to this terrible month of July, we could not but sympathise with him. But he has quarrelled with the weather ever since he began to photograph; indeed, some of his acquaintances go so far as to say that he took up the art in order to enlarge his opportunities for grumbling at the elements. If the sun shines brilliantly and it is seasonably hot, he will tell you that he had set apart this very day for sensitising carbon tissue, or for making gelatine emulsion, or for doing something else where coolness was required. Or he will tell you endless stories of how he went to a particular place to take a certain photograph with an ash tree or a birch tree in the foreground, and how that particular tree could only be taken in the absence of wind; how he had chosen a muggy, sultry day for his work, and how a gale sprang up directly he put up his tripod on the spot. "Just like my luck," he always says at the end of one of these painful narratives. "If I were a farmer," he told us, "and my crops needed rain, I shouldn't worry myself at all. I should arrange to print a few photographs, for I am certain that directly I got out my frames,

and prepared for a good day's work, the rain would come down in torrents; it always does whenever I want to print." He also tells a remarkable story of returning home from a morning's work in the open country, and coming upon a wonderful group of cattle standing knee deep in a river, and forming a most perfect picture. The animals were motionless, and he had everything in his favour for taking a fine picture. He had only one plate left unexposed, and that he was to use for this splendid work of art. Gold and silver medals already dangled in imagination before his eyes, and this picture he was determined should be the picture of the season. He focussed with extra care, and made his exposure, but only just in time, for the cattle presently moved out of the water. Packing up his camera, he made the disgusting discovery that he had never drawn the shutter of the dark slide. He, of course, does not attribute this accident to any fault of his own, but to some persistent flies which would swarm round his head while he was focussing the picture. He is not a very pleasant companion to go out photographing with, because if you make a remark, or sneeze, or cough, and he happens at the moment to expose a plate a second time, he blames you as much for the loss of his two pictures as if you had caused him to sacrifice as many bank notes.

But it is in the dim obscurity of his dark room that this grumbling friend of ours is seen, or rather heard, at his best. If a picture is over or under-exposed, or if no developer or combination of developers will bring out any trace of an image—and this is often the case with our friend—there is heard through the door sounds of quarrelling, which generally finish up with a smashing of crockery. It is only our friend grumbling at his results, and smashing his plates by way of emphasizing his disgust. The storm for the moment appears to have past, but presently you will see our friend emerge from his dark-room with a frowning expression of determination upon his face. He makes for the nearest table, sits down, and writes a letter to the unfortunate plate-makers of such a character that they would be fully justified in bringing an action against him for slander, if they cared to do so. On one occasion this dyspeptic individual bought, on the recommendation of a friend, a new changing-box, and on the first occasion of using it returned without it. Upon asking what had become of it, he acknowledged that one of the plates having stuck in it, he had been so exasperated that he threw the box down in the road and jumped upon it. The jumping he owned had not cured the evil—but had smashed the apparatus to splinters. Our friend's experiences of toning silver prints are too sad for description, neither will we harrow the feelings of our readers by telling them more of the many difficulties which beset him. We endeavoured lately to point out delicately to him that some at least of these evils are of his own creation, and may possibly be traced to an abnormal condition of his digestive organs. He differed with us, and we have not been on speaking terms since.

INDIAN NOTES.

BY COLONEL J. WATERHOUSE, B.S.C., ASSISTANT-SURVEYOR-GENERAL OF INDIA.

Eikonogen Developer for Bromide Prints and Enlargements.—The following developer, given in Eder's last *Jahrbuch* by Dr. Just, as Dr. Krugener's, has been found to answer well for bromide paper enlargements. In 20 ounces (or 600 c.c.) of distilled water, 320 grains (or 20 grammes) sodic sulphite, 240 grains (or 15 grammes) sodic carbonate, crystals are dissolved; and then 80 grains (or 5 grammes) of eikonogen added with potassic bromide, as required, up to 10 drops (1 : 50) per 1,000 c.c. of developer. Very short exposures are required with this developer, and if the exposure be correct, the image is well detailed, and of a good colour. It is said that old eikonogen developers work better for bromide prints than fresh ones; but with old developers there seems to be a tendency for the paper to stain round the edges, especially if it also is old, and therefore it may sometimes be better to use freshly-made developer in small quantities for each print, with a little once used added, in preference to developing a batch of prints one after the other in the same solution. It may be noted that developer that has been repeatedly used becomes strongly fluorescent or dichroic, appearing a bright dark green by reflected light, and a dark olive yellow by transmitted light, very much like petroleum oil.

Preserving Eikonogen.—Eikonogen seems to be very readily decomposed by air and moisture, more so than pyrogallol or quinol, and it would be a great thing if some means could be found for keeping the crystals free from discolouration. They seem to be quite insoluble in alcohol, and it might answer to fill up the bottles containing them with this fluid, or some not too volatile hydrocarbon from which they could easily be freed by evaporation when required. The brown colouring matter, which results from the oxidation, has a certain staining action on the gelatine film, and in preparing solutions it is well to wash the crystals once or twice with a very little water to remove the colour, and then to dissolve the clean remainder in the proper quantity of distilled water. This, however, involves a certain loss of material, which is better avoided if possible. The solution with sodic sulphite gradually darkens if exposed to air, and therefore the stock solutions should be kept in bottles well filled up and closed. In a recent number of the *Journal des Societes Photographiques* a very ingenious method of keeping a bottle filled up is reported as brought before the Versailles Photographic Society by Monsieur Fourtier. It would seem that a hydroquinone developer is sold ready prepared, accompanied by a box of glass beads, which are to be put into the bottle to replace the fluid taken from it from time to time, and thus keep it filled up. The plan will be useful for all stock developers, and if glass beads are not available, clean glass (old plates) broken into small pieces, pounded quartz, or small pebbles, would answer equally well. The dodge is by no means new, but I do not recollect seeing it used in this connection before, and it is certainly worth noting.

Eikonogen for Instantaneous Work.—Further experience with eikonogen seems to show, as already recognised in Europe and America, that it is likely to be particularly valuable for instantaneous work, and that not so much from the mere shortening of exposure, as for the power it gives of using a very much smaller stop in the

lens. Hitherto, when working with the ordinary pyro developer, I have generally found it necessary to use nearly the full aperture of a 7½-inch focus rapid symmetrical lens to cover a 5 by 4 plate fairly to margin. With this aperture, and using extra rapid plates, not drop shutter, over-exposure was rare, and the plates more inclined to be under-exposed than otherwise. With the eikonogen developer recommended by Dr. J. Nicol, in the last *Photographic Times Almanac*, and working in the same way, I found that my plates were considerably over-exposed, and further trials have shown that the working aperture may be very considerably reduced, the smallest stop being sufficient for open, bright subjects with sky and water, and the medium for close work with foliage; there is the further advantage that, if desirable, a shorter focus lens (6-inch) can be used to cover the same sized plate. It seems probable that before long all out-door work in fine weather will be done instantaneously, and this new developing agent will undoubtedly be a very great aid in this direction. There does not seem to be the same tendency to excessive density and hardness as with hydroquinone or pyro in cases of under-exposure, and there is a greater tendency to weakness and want of density by over-exposure, or by too quick development. The image should come up slowly, gathering density as it goes on, and plates may be given a prolonged development without showing the fatal mottling which is observable with hydroquinone. For studio work and interiors where it is possible to effect a substantial reduction of exposure, eikonogen will also be found useful. For vigour and delicacy of gradation it seems at present inferior to pyro, but with it, as with other developers, the result depends very much on the strength of the solutions, and the relative proportions of eikonogen and alkali, as well as on the lighting and exposure given.

Eikonogen Developer without Sulphite.—In nearly all the published formulæ the addition of sodic sulphite in varying proportions, usually from twice to four times the eikonogen, is recommended, and no doubt it is valuable for preserving the solution in good order. Unfortunately, like many sulphur compounds, sodic sulphite readily decomposes, and there can be no doubt that partially decomposed or impure sulphite in the developer is a fertile source of surface stains and discolouration, especially if the sensitive gelatine silver coating of dry plates, films, or paper has itself become decomposed by keeping, as those sent out to this country often are found to be on arrival. In Europe there need be no great difficulty about obtaining supplies of fresh sulphite as required, but in this and other distant lands dependent upon Europe or America for chemicals and other products of civilisation, there can be no certainty as to this material being fresh and pure, though its purity as regards freedom from sulphate may easily be tested with a little baric chloride or nitrate. Even if fresh and good when received, it soon spoils by keeping in the corked bottles it is usually put up in, and should be kept in well-stoppered bottles. It seems, therefore, desirable, if possible, to dispense with the sulphite, at any rate for home work, and use freshly made-up solutions of eikonogen, adding the requisite quantity of alkali, with a little restraining bromide to give density if necessary. Some experiments have been made with this object, but the weather is unfavourable at present, and I have not yet ascertained the best proportions for general use. A solution containing 1 to 1½ parts of eikonogen and 1 to 2 parts of sodic carbonate crystals to 100 parts of water, seems likely to work well, the relative proportions of eikonogen and alkali being modified to suit the exposure and type of plate used. Potassic carbonate has also given good results, but further trials are necessary. I hope to have more to say on this subject at a future time, as well as upon other preservatives than sulphite for the eikonogen solution.

Keeping of Erythrosin-Silver Plates.—Some Swan's plates which had been prepared by Mallmann and Scolik's erythrosin-silver bath process for orthochromatic work, on the 19th of October, 1888, or about twenty months ago, and had since been kept in a cardboard box in a light temporary dark-room, made of Willesden paper, out in a verandah, were lately exposed. Though they had somewhat lost sensitiveness, they developed quite clear and free from any fogging round the edges, and were only slightly marked by finger spots. This would seem to show that the erythrosin-silver compound acts beneficially in preserving orthochromatic plates in this climate. The English orthochromatic plates, though working admirably when fresh, soon deteriorate under similar circumstances. The erythrosin-silver plates referred to have been kept wrapped up in pairs, face to face, and it has been found that plates kept in grooved boxes, tin, wood, or card, very soon become decomposed round the edges. Some other plates (Wratten's and Ilford's) prepared with æsculin and ammonia, with salicin and ammonia, and with a certain resinous chlorophyll solution, upwards of a year ago, backed in the same way, and also left through the monsoon in the little paper dark-room, seem none the worse. They developed quite clearly with eikonogen, and barely show a speck of fungus.

Acid Fixing Bath.—Several Continental writers have lately recommended an acid fixing bath as being more permanent, and tending to clear plates from stains, as well as hardening the film. In Eder's *Jahrbuch* for 1890, Herr Lainer has recommended the following:—

A.—Hyposulphite of soda	...	...	160 grammes
Dissolved in water to	...	...	800 c.c.
B.—Sulphite of soda	...	...	20 grammes
Water	...	...	80 c.c.
Hydrochloric acid	...	...	10 ,,

Mix A and B; the result is a clear solution, with a very strong smell of sulphurous acid, which soon goes off. This solution has been used with the eikonogen developer for plates and celluloid films. It kept clear at first, but after a week or so a copious black precipitate was formed, and the sides of the bottle were thickly coated, just as with the ordinary fixing bath. The solution has, however, only a very slightly sulphurous smell, the smell of camphor from the films predominating, and it is quite free from colour. The hardening effect claimed for the bath has not been very noticeable. Trials have also been made with another similar bath containing chrome alum, recommended by Cramer for use with the American plates made by him. The formula, as given in *Anthony's Bulletin*, is—

Sodium sulphite crystals	...	4 ounces (120 grammes)
Water	...	1 quart (1 litre)
After being dissolved, add—		
Sulphuric acid	...	½ ounce (15 c.c.)
Chrome alum powder	...	3 ounces (90 grammes)
Dissolve, and pour into a solution of—		
Hyposulphite of soda	...	2 pounds (1 kilo)
Water	...	3 quarts (3 litres)

The bath, when first made up, was clear, but soon became

turbid, and deposited a yellowish-white precipitate. It is claimed for this, also, that it remains clear after frequent use, does not discolour the negatives, and forms no precipitate upon them. It also hardens the gelatine to such a degree that the negatives can be washed in warm water, provided they have been left in the bath a sufficient time. It is recommended that they should be allowed to remain in the bath from five to ten minutes after the bromide appears to have been dissolved, in order to secure the permanency of the negative and its freedom from stain, as well as the hardening of the film. This bath has a strong green colour, and the negatives fixed in it all show a greenish tint when laid upon paper, though it is not perceptible by transmitted light. It has also precipitated, but not so much as the other bath. It certainly does harden the gelatine film very strongly, but if the film is hopelessly soft to begin with it will not save it; the outside skin gets tanned, and is liable to separate from the lower one, or it becomes wrinkled all over. A solution weaker in chrome alum would probably be better for such films. After about ten days' moderate use it has only a very slightly sulphuretted smell, not nearly so strong as the ordinary bath would have. It has been used almost exclusively with the eikonogen developer. So far, the advantages to be gained by these acid fixing baths are not quite apparent, but further use, in comparison with the ordinary bath, may bring them out. In this country, a fixing bath which would remove stain, and effectively harden soft films without reticulating them, would be very valuable.

FLEXIBLE SUPPORTS FOR PHOTOGRAPHIC FILMS.*

BY J. S. FAIRFAX.

Heretofore it has been customary to form the sensitised gelatine film used in the production of photographic negatives, commonly known as "dry plates," upon transparent glass. The increasing use of the dry plate process for out-of-door photography has added to the demand for a light plate, which will reduce to a minimum the weight to be transported.

Paper has been used as a temporary support; the sensitised film being laid upon it in long strips, and apparatus provided by which rolls of this film can be placed in the camera, unrolled without opening the camera, and successive plates exposed. This improvement has lessened weight, but on account of the want of transparency in the paper, it has been found necessary, after exposure and development, to separate the film from the paper, and coat the film with collodion. The pyroxyline support, thus provided, requires skill to apply, and an accident may destroy the picture on the negative; while it has been found impracticable to thus secure anything but a very light and unsubstantial support.

Attempts to substitute pyroxyline for paper in the first instance have not proved successful, the strips of celluloid or plastic compounds of pyroxyline (either rolled or split thin) having insufficient flexibility for use on rolls. It has also been found impracticable to form these pyroxyline supports by means of ordinary collodion, the film which could be formed from a single application (unless the liquid when applied was too thick to flow) being too unsubstantial, while subsequent applications injuriously acted upon or dissolved the previously formed film. Moreover, the great contraction of collodion in drying was objectionable, as it caused the film to buckle.

The improved film or support may be made from a thin solution of pyroxyline flowed upon a smooth surface, called a "carrier," and the thickness regulated by the number of coats, when, by using a nearly saturated solution, I am enabled to apply successive coats of this pure pyroxyline compound, which, heretofore, has not been done. It may be made also from a very heavy solution of pyroxyline, and spread upon the carrier, the thickness being regulated by the spreader. In practice I prefer to use the heavy solution and spread it, as it is more quickly done, and cheaper than by flowing. In making these solutions, I use as a solvent any liquid or solvent which will thoroughly dissolve the pyroxyline, and will not give the film a greasy surface—to which the gelatine emulsion will not adhere—nor injuriously affect the gelatine emulsion when applied. In the heavy solution it is preferred to use gum camphor as one of the solvents, and I mix with the solution any of the miscible non-solvents, such as amyl alcohol, butyl alcohol, and petroleum naphtha, which, while having little or no solvent power in themselves, are often desirable ingredients in these solutions from their water repellant qualities and cheapness.

Having thus outlined the invention, I will proceed, more particularly by way of illustration, to describe some methods of applying it. I do not, however, wish to be understood as confining myself to the particular methods of application mentioned, as there are various other ways which involve merely such modifications of the solution as will be readily suggested to those skilled in the art.

For a thin solution to be flowed upon glass, or other polished carrier, the following is found to be a good formula:—

Methyl (or wood) alcohol	40 gallons
Amyl, propyl, or butyl acetate, or mixtures thereof	20 ,,
Amyl alcohol	40 ,,
Soluble pyroxyline	50 pounds

The solution is so nearly saturated that the second application thereof (which is frequently necessary to secure a sufficiently thick and substantial support) will not destroy nor injure the previously formed film. The solution is allowed to flow upon glass (preferably first coated with a thin solution of india-rubber in benzine, or other suitable coating, to prevent adhesion), and when dry it is stripped from the glass or other carrier and cut to desired sizes, or into long strips to be used from rolls, for which the invention is especially well adapted.

For a heavy solution, to be spread upon the carrier by a spreading knife or straight edge, the following formula is a good example:—

Methyl (or wood) alcohol	55 gallons
Amyl alcohol or fusel oil	20 ,,
Amyl acetate	25 ,,
Gum camphor	50 pounds
Soluble (photographic) pyroxyline ...	100 ,,

For amyl alcohol in the foregoing formulas, butyl alcohol or its isomer may be substituted, and for the amyl acetate, the acetate of butyl or other ethers of butyl alcohol and amyl alcohol which are known solvents of pyroxyline may be substituted. Also, the proportions in which the liquids are mixed will somewhat depend upon the amount of dampness in which they are to be worked,

* This is the substance of a patent of general interest to photographers, issued last Wednesday. The invention is that of Mr. Frederick Crane, of New Jersey.

the degree of solveney of the pyroxyline employed, the consisteney of the solution desired, and the amount of susceptibility to water required in the film.

The solution given in the last example is too heavy to flow, but it is distributed upon the glass or other polished carrier (prepared as before mentioned) by means of a knife or other equivalent device, as is well understood, and when the film has set or hardened, I strip it from the carrier and cut it into plates or long strips to be used from rolls.

After taking the pyroxyliue film from the glass or other carrier, I distribnte upon it the sensitised gelatine emulsiou from cylinders revolving in a trough contaiuing the emulsion, or in any of the well-known ways of distribnting the emulsion upon its support. Or I may distribute the sensitised gelatine emulsion by spreading it upon the pyroxyline film before its removal from the glass or other carrier. After being coated with the gelatine emulsion, the strips of coated films are placed in holders, or rolled upon rollers, aud are then ready for use in the camera.

If, for any reason, it is found desirable to use less pyroxyline, or to use stronger or more energetie solvents in any of the solutions named, the surplus or too aetive solvent power may be reduced by the substitution of miscible non-solvents in sufficient quantity to neutralize the excess of solvent, the amount of these non-solvents to be used in any case depending entirely upon the amount of unemployed solvent power which is desirable to reduce.

It is to be understood that I do not confiue myself to the particular solvents named which are enumerated as examples. For instance, in place of, or iu conjnnction with, amyl alcohol, or fusel oil, or butyl alcohol, or their isomers, I sometimes use benzoline or petroleum naphtha or benzoline.

It is necessary, however, to use about the proportions named of non-hygroscopic menstrua to prevent clouding the resultant film; but in general, any of the well-known solvents and well-known non-solvents may be employed, provided they are not of such a greasy nature as to prevent the adherence of the sensitised emulsion to the finished film; and the choice of these depends upon the time required for the film to set or dry.

This invention may also be used as a support for photographic prints, especially in the production of transparencies.

MAGNESIUM LAMP.—Mr. R. Robert is placing on the market a small apparatus which has been patented in France as "Le Tison Eclair," to be known here as "The Lightning Fusee." The advantages claimed are its portability, its safety, the brilliancy of its light (serving to illuminate objects within a radius of ten yards), and the ability to use it in the open air in any weather. The magnesium powder, of which the little apparatus carries twelve charges, is driven by pneumatic pressure through the flame of a fusee-vesta placed in a holder in front of the instrument.

A CAMERA-STAND ADJUNCT.—Messrs. Watson and Sons have just introduced a device for rendering a tripod stand more stable on slippery surfaces, such as polished wood or stone, or the deck of a ship. It consists of three little brass thumb-screws for affixing at any desired level to the three legs of the stand. From each thumb-screw proceeds a cord to a light, peculiarly-shaped piece of brass which the three cords hold in suspension horizontally beneath the centre of stand-head, and to which piece of brass the cords hold on firmly by friction. The legs are thus "tied," so to speak, at any desired angle to each other, and when accidentally kicked underneath are not likely to fall or to allow the camera to be upset.

Notices of Books.

DIE ORTHOSKIAGRAPHISCHE PHOTOGRAPHIE. Bemerkungüber Misserfolge und deren Abhilfe, und Sammlung von Receptеn. Ludwig David and Charles Scolik. *Halle: W. Knapp.*

THIS work, forming the second volume of David and Scolik's Manual of Photography with bromide of silver gelatine, is itself divided into three parts. The first part treats upon orthochromatic photography, and will be found to possess great interest to those who either propose to prepare plates giving what is known as orthochromatic effect, or to use such plates prepared commercially, with an understanding of the amount of effect that they should expect, and of the extent to which that effect may be modified and controlled by the use of coloured screens or other artifices.

On the vexed question of the ultimate reason why the addition of certain dyes to an emulsion should render it sensitive to certain rays, we do not find a great deal written. Doubtless the authors reasoned that it would be a mistake to devote much space in a work intended principally for the use of the practical photographer, to the consideration of the polemics of the question, respecting which such wide differences of opinion prevail amongst those who are entitled to be considered authorities on the subject. Concerning a practical method of ascertaining the effect of particular sensitisers, and reasoning therefrom with regard to their use with the sensitive silver salts, we find the following summarised remarks.

In order to discover a suitable dye stuff for sensitising the photographic film for rays of any particular colour, an image of the solar spectrum is projected by means of a prism, and a vessel containing a solution of the substance to be examined is placed in the path of the rays between the slit and the prism. It is then found that certain rays disappear, and their place in the spectrum is occupied by dark lines (absorption lines). It is noted what are the lines thus absorbed and extinguished. If, for instance, the interposed vessel contain aniline red or napthalin red, as those dyes absorb the yellowish-green rays, we find in the spectrum band a dark strip between the solar lines D and E. We can then form a judgment, from the influence which a dye stuff has upon the visible spectrum, of the effect which it may be expected to produce in sensitising for colour the photographic salts.

There are two coloured plates in the work, one of which shows the spectrum, both continuous and solar, accompanied by photographs of the spectrum taken, with the silver salt affected by various of the recognised colour-sensitisers. Here may be noted the effect of cyanin and of a mixture of cyanin and chinoline red in carrying the photographic action considerably beyond that effected by eosin or erythrosin, the image in the latter case stopping short at the yellow line D, whilst with cyanin the action is carried well into the yellow orange, a colour which, from its luminosity, absolutely requires to be rendered if the plate is to approximate to a real orthochromatic effect.

The other coloured plate is one which will be appreciated, especially by those practical workers who do not care to go into the question of spectrum photography, but like to see the direct effect of sensitising for such colours as they meet with in nature and on the palette of the painter. Here we find squares covered respectively with two shades of red, orange, yellow, two greens, one yellowish, and the

other inclined to blue; two blues, and purple. The colours appear to be well and fairly chosen; the blues, for instance, though different, are both bright, and do not partake of that dark, heavy character which we have sometimes seen in such examples, when the difficulty of making blue come out dark in the resulting orthochromatic photographs appears to be met half-way by special manipulation of the colour selected. On the next page are three photographs of this sheet of colours—one taken on an ordinary plate, one on a colour-sensitised plate without, and one with, the addition of a yellow screen. This set shows the advantage to be derived from each of these aids. A pair of photographs of a landscape subject, taken one under ordinary, and the other under orthochromatic conditions, strikes us as being the least satisfactory portion of the work. It is not that the difference is not manifest, for it is so in a very marked degree; but—a fault that we have before observed in similar productions—the best does not appear to have been done with the ordinary plate. Buildings and other objects in the foreground which are almost lost in general blackness might, we are convinced, have been brought out much better with a somewhat longer exposure. It is no doubt possible that in that case the distant mountains would have suffered from over-exposure, but we think it would be better to show the best that could be done on an ordinary plate with the subject as a whole, leaving the orthochromatic to beat it, perhaps, at both ends of the scale of light gradation, rather than to present for comparison a picture which strikes the observer as deficient in point of exposure.

To the illustrations and descriptions of the effect of various orthochromatising additions is added what will doubtless be the most useful and interesting part of the work to the practical photographer, formulæ and methods of using shown by experience to yield the most satisfactory results. Although few photographers now make their own emulsion and coat their own plates, there is an increasing number of those who like to orthochromatise plates themselves by the simple bath process, requiring no special installation beyond a dark cupboard, who will appreciate a work like the present, in which not only are the various methods and formulæ stated and explained, but the reason is given for the selection of one or other sensitising agent, according to the effect desired in the plate.

The second part of the work is devoted to an explanation of the various causes of failure likely to be met with in working the gelatine process. Here not only are failures described, but cuts are given illustrating most of the spots and markings to be met with in gelatine plates. A glance at these wood-cuts brings an unpleasant reminder of the failures that most have experienced in the early days of gelatine photography.

The third and concluding part of the volume contains a valuable collection of formulæ for use throughout the practise of photography with gelatino-bromide of silver. In addition to these is a short description of the effects and characteristics of most if not all of the various recipes. There is, moreover, a special chapter furnished with several illustrative wood-cuts of the various manipulations connected with printing by the enlarging lantern upon gelatino-bromide of silver paper.

New Holidays in Essex, by Percy Lindley. (*London: 125, Fleet Street*, 1890.)

This is another of the cheap little guide-books by Mr. Percy Lindley about districts connected with the Great Eastern Railway system, and is likely to be useful to photographers, so many of the short excursions of London photographic societies being to places in the Eastern counties. Essex may not be so rich in picturesque scenes as some other counties near London; nevertheless, it has its beautiful forest, and abounding objects of interest, as set forth in guide-books, and in the records of the Essex Field Club. Mr. Lindley's book is well illustrated, and will give its possessor, when he is travelling in Essex, an amount of information which will add considerably to his interest in the the places which he visits. The book contains a map of the county.

THE "CROTONWANZE" ONCE MORE.

When we sounded our note of warning in the January *Journal* respecting a fresh danger that threatened the American dry plate industry, we had but little idea that the matter would become one of international importance; therefore it is with pleasure that we inform our readers on both sides of the ocean that the incipient danger has passed, the dark clouds have been dispelled, and once more the photographic horizon is clear and bright without the least sign of fog. In reply to our query in the March *Journal*, Dr. A. Miethe, of Berlin, the well-known editor of the *Photographisches Wochenblatt*, in No. 17 of present volume, answers:—

"Our friends in America have shown much pleasure that we so well understood their Cimex joke, as set forth in our Letterbox notice—as our readers will no doubt recall the fact, that at the time we referred in our 'Repertorium' to an article from an American newspaper, in which mention was made of a mythical insect which had developed an especial appetite for the American dry plate. Under these circumstances we could not refrain from warning our readers against the use or purchase of any American dry plates, so as to prevent the introduction of this dreadful insect, which threatened to prove more destructive than the Colorado potato beetle, and, if possible, to obviate this great danger. Immediately afterwards there appeared in an American magazine* a well-meant sally against German thoroughness and credulity.

"In reply, we mentioned seriously as the occasion offered, that an organism outside of the Crotonwanze did exist—a fungus, which formed on damp gelatine dry plates, and that in the process of formation, growth, or existence, so changed or affected the photographic properties of the affected plate that, after exposure and development, such plates showed numberless transparent spots, and, consequently, were rendered useless. We suffered heavily during the past summer by the appearance of these organisms," writes Dr. Miethe, "and only overcame the difficulty by a thorough disinfection of our dark chest with carbolic acid and fumes of bi-chloride of mercury. The plates which had been thus affected, as a matter of course were lost or spoiled, and herein the friendly editor of the *American Journal of Photography* has misunderstood us (vide *American Journal of Photography*, March, 1890, p. 89).

"We hope," continues the *Wochenblatt*, "that the little bug which threatened to assume the proportions of an immense sea-serpent has been scotched or decapitated, a 'prozedur' that we are glad to have aided in accomplishing." We of the *American Journal of Photography* also

* *American Journal of Photography*, January, 1890.

claim a share of the glory in bringing about this end, and thank Dr. Miethe for his courtesy and information, and close with the good old motto, "*All's well that ends well.*"—J. F. S., in *The American Journal of Photography.*

PHOTOGRAPHY IN CRIMINAL JURISPRUDENCE.

BY JULIUS F. SACHSE.

No sooner was photography discovered than it was recognised as one of the greatest aids to the police authorities, and became a medium for the detection of criminals and evil doers, and the consequent prevention of crime. To obtain an exact likeness and the duplication of prints or pictures, which could be sent out broadcast over the country at a comparatively small cost, thus familiarising the various local police authorities with their lineaments, was a menace to the criminal classes greater than anything which had so far been discovered for their suppression.

The criminal classes were not slow to recognise this fact, and took every means to circumvent a successful portrait being taken of themselves, while the great aim of the authorities was to obtain a serviceable portrait by which the subject might be identified at sight beyond a doubt. That this proved a difficult matter will be apparent to any one who visits a "Rogue's Gallery," as the collection of criminal portraits is called in police parlance, and which may be seen in all large cities and towns. It will be seen at a glance that, as portraits, these pictures are not a success, almost all of them having been unwilling sitters who distorted their features, and, as a result, the photographs are almost valueless for the purposes for which they are intended.

With the advent of the dry plate, instantaneous, and Blitz photography of the present day a new era opened, of which the various police bureaus were not slow to avail themselves, where formerly in "wet plate days" the criminal was taken to the "skylight" of the photographer who had the contract with the department, and which was often squares away from headquarters, and the attempt at portraiture would end in failure, even after a physical struggle with his guardians.

The writer recollects one instance in which it took four stalwart officers to hold a prisoner while the "artist" got his picture. The "cabinet" not only showed the face horribly distorted, with eyes shut and tongue out, but also the hands of one officer holding his ears, the second officer holding him by the hair, while the hands of the third showed as if he was choking the prisoner. Under the new *regime* all such scenes fall away; the subject is now taken instantaneously when he least expects it, a perfect front and profile being obtained at the same instant, showing not alone the features at rest, but also the subject's natural position.

This applies especially to the capitals of Germany and France, while the old system is still more or less in vogue in this country and England. In the latter country much dissatisfaction, photographically speaking, has lately cropped out with the Scotland Yard authorities for their adherence to the old methods, and on more than one occasion the question was brought up in the House of Commons, so far, however, without bringing any response from the Home Secretary.

In France, the photographic methods, which are extraordinarily accurate, are supplemented with a series of measurements known as "Systeme Anthropométrique." The photographic department of police headquarters in Paris now consists of a series of rooms, one for making the exposure, into which opens a waiting-room, and several dark rooms. The main room is so arranged with mirrors that face and side views are taken at the same time on the same plate. In connection with this department are facilities for making silver or bromide prints and mounting; all work and detail are done within the department without any aid or knowledge of outside parties.

It is, however, in Berlin where the highest development of police photography has been reached. Formerly the work was done by the well-known firm of Zielsdorf and Adler. Now it is done by employees of the department in the new Präsidial building erected in the Alexanderplatz, where a series of rooms connected with the criminal department has been set aside for photographic purposes, and so constructed that portraits can be taken at any hour of the day or night, the illuminant being Blitz pulver, and it is done so quickly that the accused introduced into the chamber or passage-way on his way to a hearing is actually photographed before he even has a presentiment of what has taken place. This is accomplished as follows: When the subject comes to within two or two and a half metres of the concealed cameras, a gum bulb is pressed by the operator, who is also concealed. This mere pressure not only opens the shutter, but simultaneously ignites two Blitz flash lamps, which are placed at right angles in front, about six feet to the right and left of the subject. A simple pressure of the pneumatic tube, a flash, and before the subject can get over his surprise he is led out of the room, while the plate is developed and fixed in the adjacent dark room. It is said that the exposures obtained by this process have been almost always successful.—*American Journal of Photography.*

PHOTOGRAPHIC CLUB.—Subject for discussion Wednesday, July 30th, "Printing with the Salts of Chromium;" August 6th, "New Hand-Cameras." Saturday outing, July 26th, St. Albans. Train from St. Pancras, 2.37.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—The subject for consideration on Thursday, July 31st, will be "Home Portraiture;" the question to be opened by Mr. W. E. Debenham. Visitors invited.

PHOTOGRAPHY was represented in the theatre of the Liverpool Polytechnic Exhibition on Thursday last. Mr. Henry E. Burn delivered a lecture on the progress and promise of the art science, which was followed by a lantern exhibition of the work of the Walton Photographic Society, of which he is the president. Mr. W. Tyerman was the lanternist, and the chair was filled by Mr. F. Murphy, an amateur photographer.

PECULIARITIES OF EIKONOGEN.—The members of the Providence Camera Club have had a singular experience with eikonogen. Stock solutions stored in glass-stoppered bottles in the lockers of the dark room deteriorate badly within twenty-four hours, while the same solutions retain their good qualities for weeks in the private dark rooms of the members. This opens up an interesting question, and one that we would like to have satisfactorily answered. It may be that the large number of different chemicals kept in the club lockers may be responsible for the trouble, or there may be some peculiar atmospheric conditions present, or, as Mr. Davison suggests, the trouble may be caused by the fact that the dissolving key of the stereopticon is kept in the lockers. Any one who has had any experience with dissolving keys knows that there always hangs about them a strong odour of gas, the presence of which may have caused the mischief. Eikonogen has as many moods as the fair sex is credited with, only in the case of eikonogen they are not always charming.—*American Amateur Photographer.*

THE AMERICAN PHOTOGRAPHIC CONVENTION.

Before the appearance of another issue of *The Beacon* the seven thousand, more or less, photographers of this country will, like the ten virgins, be divided into the wise and the foolish; but, we very much fear, unlike their prototypes, not in anything like equal numbers. We need hardly say that the wise are those who will by that time have resolved to be present at the Washington Convention and the unveiling of the Daguerre Memorial; and the foolish those who have decided to remain at home.

We believe that on a careful consideration of the *pros* and *cons* connected with such a visit the againsts will be few and the fors many.

It is true that the affairs of the Association have not always, or even often, been conducted in such a way as to meet our approval, and that the actual, as compared with the possible, benefits have not infrequently been as Falstaff's bread to his sack; but that is more the fault of those who stayed away than of those who were present. They, or most of them, did the best they could, according to their light, and while that best was not always, according to our idea, in the right direction, we have always been willing to give them all due credit for good intentions. If but one-half of those for whom photography makes the pot boil could see attendance at the Convention to be, as it is, both a duty and a pleasure, the three thousand five hundred would be a noble gathering, and one from whose ranks enough good men and true could be found to give the Conventions a character that they have never had, and do more to raise the status of photography than any scheme hitherto devised.

We know that there are hundreds, perhaps thousands, throughout the country, especially amongst those who work almost single handed, who think they cannot leave the seat of custom, without, in some degree at least, losing their trade; but this is a sad mistake. Trade, or even the *appearance* of trade, attracts trade, and the same is true also of the professions. Ministers, doctors, and lawyers know and take advantage of this fact. The hard worked or working clergyman, who leaves his pastoral for ten days to attend the general assembly of his church in some of the larger cities, is not only not blamed, but thought more highly of, therefore, by his parishioners; the young doctor, laying the foundation of a profitable practice, knows that there is no more sure or rapid means of doing so than by seeming to have his time so fully occupied as to make it somewhat difficult to find him; and the lawyer and dentist who have been students of human nature as well as of dentistry and law, keep would-be patients and clients kicking their heels in their waiting rooms, as the surest way of conveying an idea of their importance.

The practice of photography is amenable to the same influence. The time has not yet come when the studio from which the best pictures issue is the most crowded, but rather that in which the largest quantity of work is turned out, and the dear, easily led, and often misled public are often more ready to patronise the gallery where engagements can only be made several days in advance than the one in which they can only make sure of being taken at any time. Then, as it is with the parishioners of a clergyman, so it is with the *clientèle* of a photographer. They may not yet be willing to pay for his advanced culture and artistic training, but they take a pride in, and boast of the fact that *their* photographer keeps abreast of the times, and annually goes to attend the great Convention, where he can learn how to practice all the latest improvements and newest processes. All this, and more, is true, and our hesitating readers may rest assured that even from a pecuniary point of view, attendance at the Convention pays.

But there are other and not less important points from which the question, to go, or not to go? should be looked at. "All work and no play makes Jack a dull boy," and the dullness is contagious, and influences all around him. But an objectless holiday is not the true remedy. He must have something to take his mind from the ordinary routine of every-day life, and nothing is so likely to attain the end desired than attendance at the annual Convention. "As iron sharpeneth iron, so does the countenance of a man that of his friend," and in like manner, the social intercourse with one's fellow labourers in the photographic art obtainable at such meetings, and the being brought into friendly relation with many of those whose names are as household words, cannot fail to exercise an influence for good.

Over and above all this is the actual practical benefit derived from a study of the exhibition of photographs, which ought to and generally does include the embodied ideas of the best men in the profession on both sides of the Atlantic as to what ought to be the aim and object of the photographer. That this embodiment has hitherto run too much to the technical, to the detriment of the truly artistic, is the result of accidental circumstances more than the fault of conventions as such, and as the best men gradually become, as they are becoming, more of the artist and less of the mere photographer, the educating influence of those exhibitions will acquire a higher and higher degree of value.

In conclusion, we may say that we do not think our expectation of seeing at the Convention an attendance of between three and four thousand—half the photographers of the country—at all too high. The Washington will not in all probability reach anything like that number, nor may any of those of the next few years, but we believe that photographers are gradually learning that the true way to raise their status and secure the respect they are fully entitled to, is to respect themselves, and to become worthy of respect by taking advantage of every opportunity for self-improvement, the diffusion of the *entente cordiale* between the members of the profession generally, and carefully studying the highest possibilities of the art as they are exhibited, and straining every nerve to equal, if not surpass them. These are the desiderata that conventions are intended to bring about, and the object will be attained just in proportion as the attendence at the conventions increase.—*The Beacon.*

Miss Catherine Weed Barnes, the writer of the article "Illustrating Poems by Photography," quoted in our last issue, is preparing to enter the competition for the illustration of the poem "Enoch Arden," to be exhibited at the Photographic Convention at Washington on the 12th of August.

Aluminium.—M. Minet has placed before the French Academy of Sciences a process of extraction of aluminium by the electrolysis of a fluoride of this metal in a molten state; he employs an electrolytic bath composed of chloride of sodium 60 grammes, double fluoride of aluminium and sodium 40 grammes. He gives various details of the method of procedure. He produces by this method 21·5 grammes of aluminium for an expenditure of 1-horse power per hour, and 30 grammes might be attained in actual practice.—*Invention.*

Notes.

Sometimes complaints are sent to us about photographers who detain the specimens they have demanded from assistants out of a situation, such detention being often a grievous injury to the member of the fraternity in adverse circumstances. The informants give us the names and addresses of the photographers who are alleged to have done such a shady trick, in order that we may publish the same, and thus take the moral and legal responsibility of bringing a public charge against a man's character, based on alleged facts outside our personal knowledge, unless by means of previous investigation which could rarely be given. A better remedy which has been suggested is, that the assistant should write the particulars to the superintendent of police in the town in which the photographer resides. We have another suggestion to make, and that is that the Photographers' Benevolent Association should investigate and deal with such cases. It would increase its popularity immensely, and it seems to be within its province to take action of this kind, to prevent the said assistants from being obliged later on to make a heavier and more prolonged demand upon its funds and attention.

The advice given by an American journal to a photographic amateur who asked the best method of reducing a photograph, and received for reply, "Grind it down on the step of the back door," has been partially paralleled in sober earnest in France. The last number of the *Bulletin* of the Photographic Society of the North of France sets forth how M. Poly gave a demonstration before the Society of his method of obtaining a matt surface on Obernetter paper proofs. The finished prints were rubbed with fine pumice powder, and the results, says the report of the Society, were "very artistic."

The same journal contains an interesting collotype illustration by Messrs. Berthand, Brothers, from a negative by M. J. Cornetet, representing the theatre of Augustus, at Arles; also other Roman ruins in its proximity. The action of time and weather, the depredations of man, and occasional tremblings of the earth, have done much to destroy this building since it was repaired by Constantine; the ruins are nevertheless remarkable and of great extent, and they are now carefully preserved. The women of sunny Arles, in the South of France, are said to be the most beautiful in Europe, and the Editing Committee of the North of France Society says that this reputation may be in part due to their graceful costume, which changes not with the fashions of the day, but is of high antiquity, and preserved unchanged to this day.

Now that the tourist season is approaching, it may not be inappropriate to draw attention to a difference in his favour which the landscape photographer will find when working in some parts of Switzerland and other portions of central Europe far from the Atlantic, namely, the small average amount of wind to disturb the foliage. About the Lucerne district, for instance, it is common for three or four days in succession to pass away without sufficient wind to disturb the delicate leaves of the silver birch. When a Swiss from this district first visits England, for the first week or two, until the impression wears off, he wonders what is the matter with the weather, for the wind seems to him to be eternally blowing with a persistence outside his previous experience.

Potassic chlorate has been responsible for not a few deaths from its accidental ignition or explosion. These have mostly occurred with oxygen gas making for the limelight, and, happily, the number of such accidents will be reduced to a minimum now that the ready-made gas has become such a common article of commerce. A few fearful accidents have, too, overtaken boys with chemical proclivities who, in their experimental zeal, have endeavoured to make "bangs" by the attrition or percussion of chlorate with some sulphur compound; but the most curious accident with this explosive agent which has yet been recorded took place recently at some chemical works at Flint, where a workman, striking a match upon his trousers, after the manner of workmen, found himself enveloped in fire, which burned the poor fellow so shockingly that no hopes are entertained of his recovery. It seems that his clothing had become so impregnated with the chlorate that it resembled a mass of touch-paper, only waiting for the initial spark to set it aflame. That spark the match supplied.

It is easy enough to be wise after the event, and to point out how the terrible fatality might have been obviated by taking precautions against the dust accumulating, or by preventing the use of matches in the building. But the right course to follow would be to give to every workman who has to deal with dangerous agents a knowledge of their properties and general behaviour under different conditions. Many months have not elapsed since, at a quarry, some men were killed while thawing dynamite over an open fire in a saucepan. The inquest revealed the startling fact that, although proper vessels are constructed for this work, no one in the place knew anything about them. The saucepan had always been used by the men, and familiarity had bred a contempt for danger which they dearly paid for.

The *Standard* of Monday last, referring to the identification of the body of the burglar who, a few days previously, shot himself to avoid capture, states that "It is a curious fact that the police have in their possession sheets of photographs of discharged prisoners, including one which was believed to be the deceased, described as Richard Batten, who was sentenced at the Central Criminal Court in 1877 to seven years' penal servitude." We do not quite see why this fact should have anything phenomenal about it, considering that for many years it has been the custom to

photograph all prisoners; but it is certainly curious that the police failed to identify the body by the picture which they possessed, and that it was left for his widow to do so by the clothing upon the body.

"A prominent photographer," who has been recently interviewed by a reporter of the *New York Sun*, has had a good deal to say against people who come to be photographed accompanied by interfering relatives who know—or think that they know—much more about posing and lighting than does the artist himself. He quotes one case in which a lady in bridal attire came to his studio: "She walked up to the chair, and as she turned to face me the silk train and thin veil fell in wonderful folds of graceful outline. I told her not to stir, but while I stepped back to get the effect, her friend darted out and straightened the whole thing out like a flag in a head wind." Many of our readers have good reason, we feel sure, for sympathising with this complainant. It is, however, difficult to suggest a remedy which would not be likely to cause offence. A little tact mingled with courtesy will, as a rule, be the best mixture to apply.

Pyrogallol is so little used in medicine that it has no place in the British Pharmacopœia. Its principal employment—beyond its well-known use in photography—is for hair dyeing, when it is also used in conjunction with silver nitrate. It has also been recommended as the principal constituent of a salve for certain cases of skin disease, but so far as we know has never been used in any shape or form for internal administration. It is known to be extremely poisonous, but how many grains may represent a fatal dose has not, happily, as yet been determined.

The decision given in the celebrated copyright photographic case, in which the Stereoscopic Company were the plaintiffs, received endorsement in a judgment delivered by Mr. Justice Wills the other day. It will be remembered that in the photographic case it was laid down that the operator who took the photograph, and not the proprietor of the business, was the author for purposes of registration. The case decided the other day turned upon the question of copyright in a drawing. The originator of the idea had the drawing made by an artist, and this drawing was afterwards pirated by the defendants, although the reproduction was not an exact copy. The judge held that the action for infringement of copyright could not be maintained, one of his reasons being that the plaintiff, though the originator of the idea, was not the author of the drawing. It is well that photographers should bear the law in mind, as they may lose their rights in a valuable photograph from ignorance of legal technicalities.

This decision in the case of photography involves a certain amount of absurdity, because it is clear that one man may pose the sitter, and make all the arrangements, and be responsible for the art qualities of the picture, while the other man does no more than take off the cap and develop the plate. Yet the mechanical operator is deemed the author! This is only one of the anomalies of the Copyright Act, which, according to a well-known barrister, is full of blunders. It is said that the clauses are so exclusive of this and that right, that now, unless a special agreement is drawn up and signed "before purchase," the copyright is lost to both purchaser and painter. Even if the purchaser gave the painter the copyright, after purchase "the gift fails for want of consideration," and the same if the gift is from the painter to his patron. In certain cases, the value of the copyright becomes so enormous that it would be interesting to know how the parties interpret the Act. Take Mr. W. E. Lockhart's much talked-of jubilee picture, for instance. In the first place, the painter's commission was £1,000, and when it came to the disposal of copyright, the best offer obtained was one of £200 from a leading firm of dealers for the right to reproduce the picture, and absolute control over it for one year. Mr. Lockhart thought the copyright was worth more, and he organised a syndicate to exhibit the picture, with the result that the painter received £2,000 for the copyright and use of it for exhibition during twelve months. It is said that the sale of photogravures will probably produce between two and three thousand pounds more. This transaction on the face of it appears to be a little involved, and one would like to know how the more involved conditions of the Copyright Act have been complied with.

M. Reutlinger, the well-known photographer of Paris, is the photographer *par excellence* of cats. A delightful photograph of a kitten in a large glass funnel stuck in a bottle, is reproduced in a recent issue of *La Nature*, and its charming unconsciousness and grace are commented upon in terms of well deserved praise by the editor, M. Tissandier. M. Tissandier strongly advises amateurs to practise taking the photographs of animals, and quotes approvingly M. Legouvé's witty description of the average portraits of the human being, as seen in the album, to show the superiority of animals as sitters from an artistic point of view. M. Legouvé, looking through an album one day, said: "These people are much more like their portraits than they think for, for it is not to be doubted they have worked in themselves their own likeness, and have thus been at once models and painters. More than one, I am sure, when sitting down on the photographic chair, has taken his favourite pose, and has arranged his features according to his own predilection, expressing not what he is, but what he believes himself to be. For instance, here is one who is slily smiling; evidently, he imagines himself to be witty. This, with the eyes uplifted to Heaven and his wild hair, belongs to the class of inspired poets! I should be surprised if this person, who looks you in the face with such keen eyes as though he would pierce you through and through, is not saying to himself: 'What an eagle eye I have, nothing escapes me!' "There is nothing like this in the photographs of animals," observes M. Tissandier, and everyone will agree with him.

THE GLOW OF PHOSPHORUS.*

BY PROFESSOR T. E. THORPE, F.R.S.

THE earlier volumes of the "Philosophical Transactions" contain several papers on the luminosity of phosphorus, and one by Dr. Frederick Slare is noteworthy as giving one of the earliest, if not actually the earliest, account of what is one of the most paradoxical phenomena connected with the luminosity of phosphorus, namely, its increase on rarefying the air. "It being now generally agreed that the fire and flame (of phosphorus) have their pabulum out of the air, I was willing to try this matter *in vacuo*. To effect this, I placed a considerable lump of this matter (phosphorus) under a glass, which I fixed to an engine for exhausting the air; then presently working the engine, I found it grow lighter (*i.e.*, more luminous), though a charcoal that was well kindled would be quite extinguished at the first exhaustion; and upon the third or fourth draught, which very well exhausted the glass, it much increased its light, and continued so to shine with its increased light for a long time; on re-admitting the air, it returns again to its former dulness." This observation was repeated, and its result confirmed by Hawksbee in this country, and by Homberg in France, and seems subsequently to have led Berzelius and after him Marchaud, to the conclusion thatt he luminosity of phosphorus was altogether independent of the air (*i.e.*, the oxygen), but was solely due to the volatility of the body. Many facts, however, combine to show that the air (oxygen) is necessary to the phenomenon. Lampadius found that phosphorus would not glow in the Torricellian vacuum, and Lavoisier, in 1777, showed that it would not inflame under the same conditions; and the subsequent experiments of Schrötter, Meissner, and Müller are decisive on the point that the glow is the concomitant of a chemical process dependent upon the presence of oxygen. It is, however, remarkable that phosphorus will not glow in oxygen at the ordinary atmospheric pressure and temperature, but that if the oxygen be rarefied the glow at once begins, but ceases again the moment the oxygen is compressed. Indeed, phosphorus will not glow in compressed air, and the flame of feebly-burning phosphorus may be extinguished by suddenly increasing the pressure of the gas. Phosphorus, however, can be made to glow in oxygen at the ordinary pressure, or in compressed air, if the gases are gently warmed. In the case of oxygen the glow begins at 25°, and becomes very bright at 36°. In compressed air the temperature at which the glow is initiated depends upon the tension. If the oxygen is absolutely deprived of moisture, the phosphorus refuses to glow under any conditions. This fact, strange as it may seem, is not without analogy: the presence of traces of moisture appears to be necessary for the initiation or continuance of chemical combination in a number of instances.

It was observed by Boyle that a minute quantity of the vapour of a number of essential oils extinguished the glow of phosphorus. The late Professor Graham confirmed and extended these observations; he showed that relatively small quantities of olefiant gas, and of the vapours of ether, naphtha, and oil of turpentine entirely prevented the glow, and subsequent observers have found that many essential oils, such as those of peppermint and lemon, and the vapours of camphor and asafœtida, even when present in very small quantity, stop the absorption of oxygen and the slow combustion of phosphorus in air.

* A portion of a lecture delivered at the Royal Institution.

It has been established that whenever phosphorus glows in air, or in rarefied oxygen, ozone and hydrogen peroxide are formed, but it is not definitely known whether the formation of these substances is the cause or the effect of the chemical process of which the glow is the visible sign. That there is some intimate connection between the luminosity of the phosphorus and the production of these bodies is highly probable. Schönbein, as far back as 1848, sought to demonstrate that the glow depends on the presence of ozone. It is certainly true that many of the substances—such as the essential oils—which prevent the glow of phosphorus also destroy ozone. At a low temperature phosphorus produces no ozone in contact with air, neither does it glow. It has been found, in fact, that with air ozone is produced in largest quantity at 25°, at which temperature phosphorus glows brightly. On the assumption that the oxidation of the phosphorus consists in the immediate formation of the highest oxide, the production of the ozone and the hydrogen peroxide has been represented by the following equations:—

$$P_2 + O_2 = P_2O_3 + O$$
$$O + O_2 = O_3$$
$$O + H_2O = H_2O_2.$$

Both these reactions may, of course, go on simultaneously, as ozone and hydrogen peroxide are not mutually incompatible; the synthesis of hydrogen peroxide by the direct oxidation of water seems to occur in a number of processes. But such symbolic expressions can at most be only very partial representations of what actually occurs. It is highly probable that the combination which give rise to the glow only occurs between the *vapour* of phosphorus and the oxygen. Phosphorus is sensibly volatile at ordinary temperatures, and by rarefying the atmosphere in which it is placed its volatilisation is increased, which serves to account for the increased glow when the pressure of the gas is diminished. When phosphorus is placed in an atmosphere of hydrogen, nitrogen, or carbonic acid, these gases, when brought into contact with oxygen, become luminous from the oxidation of the vapour of phosphorus diffused through them. The rapidity of volatilisation varies with the particular gas; it is greatest in the case of hydrogen, and least in that of carbonic acid. Indeed, a stream of hydrogen gas at ordinary temperatures carries away comparatively large quantities of phosphorus, which may be collected by appropriate solvents. No ozone and no glow are produced in oxygen gas at ordinary temperatures and pressures, but on warming the oxygen both the ozone and the glow are formed. On passing ozone into oxygen at temperatures at which phosphorus refuses to glow, the phosphorus at once becomes luminous, oxygen is absorbed, and the characteristic cloud of oxide is produced, and the effect continues so long as the supply of ozone is maintained. A drop of ether at once extinguishes the glow.

The ether is in all probability converted into vinyl alcohol with simultaneous formation of hydrogen peroxide by the reaction indicated by Poleck and Thümmel

$$\left.\begin{matrix} CH_3CH_2 \\ CH_3CH_2 \end{matrix}\right\rangle O + O_3 = \left.\begin{matrix} CH_2CHOH \\ CH_2CHOH \end{matrix}\right. + \left.\begin{matrix} OH \\ OH \end{matrix}\right\}$$

Formic, acetic, and oxalic acids are also formed by the action of ozonised oxygen on ether.

Phosphorus combines with oxygen in several proportions, and the study of the mode of formation and properties of these oxides is calculated to throw light upon the nature of the chemical process which attends the glow of phosphorus. Certain of these oxides have

recently been the subject of study in the chemical laboratories of the Normal School of Science. When phosphorus is slowly burned in air, there is produced a considerable quantity of a volatile substance, having a characteristic garlic-like smell which solidifies, when cooled, in beautiful arborescent masses of white crystals. It melts at about 23°, and boils at 173°. In a sealed tube kept in the dark it may be preserved unchanged, but on exposure to light, and especially to bright sunshine, it rapidly becomes deep red.* It slowly absorbs oxygen at the ordinary temperature and pressure, but from the mode in which the solid product of the reaction (P_2O_5) is deposited, it is evident that the union only takes place between the vapour of the oxide and the oxygen gas. Under diminished pressure the act of combination is attended with a glow which increases in brilliancy if ozone be present. On compressing the oxygen the glow ceases. No ozone is formed during the act of oxidation. The degree of rarefaction needed to initiate the glow depends upon the temperature of the oxide; the warmer the oxide the less is the diminution of pressure required. By gradually warming the oxide the luminosity steadily increases both in area and intensity, until at a certain temperature the mass ignites. The change from glow to actual flame is perfectly regular and gradual, and is unattended with any sudden increase in brilliancy. In this respect the process of oxidation is analogous to the slow and barely visible burning of fire-damp which is sometimes seen to occur in the Davy lamp, or to the slow combustion of ether and other vapours, which has been specially studied by Dr. Perkin. Other instances of what may be called *degraded combustion* are known to chemists. Thrown into warm oxygen the substance bursts into flame at once, and burns brilliantly; and it also takes fire in contact with chlorine. Alcohol also ignites it, and when it is warmed with water or a solution of potash it evolves spontaneously inflammable phosphoretted hydrogen. In contact with cold water it suffers only a very gradual change, and many days may elapse before even a comparatively small quantity is dissolved. This substance has long been known; it was discovered, in fact, by the French chemist, Sage, but its true nature has only now been determined: its chemical formula is found P_4O_8; hence its composition is similar to that of its chemical analogue, arsenious oxide.

The study of the properties of this remarkable substance enables us to gain a clearer insight into the nature of the chemical change attending the glow of phosphorus. When phosphorus is placed in oxygen, or in an atmosphere containing oxygen, under such conditions that it volatilises, the phosphorus oxidises, partly into phosphoric oxide, and partly into phosphorus oxide; ozone is formed, possibly in the mode already indicated, and this reacts upon the residual phosphorus vapour and the phosphorus oxide, with the production of the luminous effect to which the element owes its name. The glow itself is nothing but a slowly burning flame having an extremely low temperature, caused by the chemical union of oxygen with the vapours of phosphorus and phosphorus oxide. By suitable means this glow can be gradually augmented, until it passes by regular gradation into the active vigourous combustion which we ordinarily associate with flame. Many substances, in fact, may be used to phosphoresce in a similar way.

* This is the substance spoken of by Captain Abney in his recent lecture at the Royal Institution.—Ed.

STOPS OR DIAPHRAGMS.

BY ELLERSLIE WALLACE.

It is not quite easy to determine why the short and convenient word "stop" has been universally accepted by the photographic world as a substitute for the longer one of "diaphragm," unless we remember that photographers, as a rule, are very practical folk, and like things called by plain and short names.

It may be that the term "stop" was adopted from the fact of the light being really *stopped out* by the diaphragm; and as the Germans call it "blende," which means a blind or screen, there seems to be some probability that this is true.

Lenses sent out by manufacturers of reputation always have the stops supplied, and the position they occupy is generally fixed. This is true for such lenses as are not intended to be taken apart and their parts used alone; when this is the case the position of the stop must be changed.

Now, in spite of all this, it will be found well worth while to be familiar with a few general facts about the diaphragm or stop. First of all, we may say that stops are used to improve the defining powers of the lens, particularly on the margins and corners of the picture. This is accomplished by stopping out such rays of light as would come to a focus too near the lens, and by allowing only such oblique pencils of rays to pass as come to their focus on the plane of the ground glass. The pencils forming the more central portions of the picture pass through the opening in the stop, and come to their proper focus in very much the same manner as they would if there were no stop at all in the lens.

It is fair to say that the type or representative lens of the present day is the symmetrical doublet; or, in other words, a lens consisting of a front and a back combination which are nearly or quite twins in every respect. A more exact term in optical parlance would be to speak of the lens as what it really is, namely, a *system* of lenses.

Now, it is a matter of common observation that the position of the diaphragm or stop in these doublet lenses is always in the middle of the tube, at equal distances from the front and the back combinations. If one of the combinations be unscrewed and removed from its position, the other one can still be used for photographic exposures. The focal length of either combination, when thus used simply, is about twice that of the original lens or "system," and the field covered by the single combination will be proportionately increased in size. But if the diaphragm or stop be left in its original position, the work accomplished will not be nearly so good as it would be if the stop were moved to a new point to suit the new condition of affairs. Each of the combinations of the lens being of the meniscus form, the old rule should be here observed of turning the concave surface of the lens *toward* the subject, and of removing the stop to a distance of about one-fifth of the focal length in front of the said surface.

To take a familiar example: suppose an eleven-inch rapid rectilinear combination with the stop in the middle of the tube in the usual position, which is about an inch from either combination. Now, if it were desired to obtain the best results with either of the combinations alone, and thus to utilise the increased focal length of twenty-two inches, the proper plan would be to remove the front combination, leaving the back one *in situ*, and set the stop forward four inches from its anterior surface.

In practice this is seldom possible to do, unless a short extra tube be so adapted to the screw-thread in the front of the "system" that the desired increase of distance can be obtained. But we are sure that this hint will prove very serviceable to those who have failed in producing satisfactory results with either combinatiou of a "system."

An attempt to use the front lens of a system alone, with the stop left in its original position, thus bringing it in the rear, would be in every respect unsatisfactory.

A great deal of mechanical iugenuity has been expended upon the different forms of stops or diaphragms. The simplest and least expensive of them is the common flat, oblong piece of metal with the aperture in its centre. The sets of six of these which are usually furnished with the better classes of lenses should always have these openings quite concentric with each other. This can be verified at a glance by laying the stops together so that their sides correspond, when any want of exactitude in the openings will be seen at once.

All things considered, we should prefer this model of the stop or diaphragm to any other. The only objectiou to it is the danger of the loss of one or more of the set. In indoor work this risk will not make itself felt to the same degree as in landscape photography, where the loss of the stops would be a very serious matter indeed. A partial safeguard will be to rivet all the six together at the top, so that any one of the set may be inserted into the lens, leaving the others outside. Of course it may be objected that the loss of one will thus entail the loss of the whole; so it is, indeed, but we can safely say, after many years of work out of doors with this arrangement, that a very small amount of care will keep matters right.

The new Iris diaphragms supplied with some of the superior makes of lenses are new chiefly in the fact of an index and pointer being supplied, so that a desired size of opening can be promptly secured at will. The principle of the Iris diaphragm itself is by no means new. The fact of there being no loose pieces to get lost is the stroug recommendation of this form of stop; and when we have said this, we have pretty fairly summed up its merits. Supposing that the operator desired to make a change in the stop opening to one of another size, and that he also desired to effect the change without removing the focussing cloth from over his head and blinding his eyes with the stroug light, the ordinary central stop would be preferable to the Iris. The change from one stop to another is easily done by feeling, while with the Iris model it is necessary to see just what is being done.

The "rotating diaphragms," as they are called, are also very convenient; more so, we think, than the expensive Iris; but their use is limited to the slower working lenses, which are never used with very large or full openings.

We may here take occasion to remark that practical photographiug rarely, if ever, demands as many as six different stop-apertures. Taking landscape photography, for instauce, we may safe say that three sizes of stops would be all-sufficient. One small enough to give good definition over the entire plate, and require a rather long exposure; a large one, nearly the full opening of the lens, for instantaneous effects; and one of medium size for subjects of odd character, would be enough for practical purposes, and directly conduce to good and uniform results in timing.

Nothing has ever been gained by altering the stop opening from a circle to a square, oblong, triangular, or other form. A circular hole, neatly countersunk in the metal, so that a mere edge is presented to the rays of light as they enter, is all that is necessary. Stops standing at an angle, and "sky-scrapers," as they used to be called, have had their day, and are now forgotten.—*American Journal of Photography.*

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

New Intensifying Method—Combined Hydroquinone and Eikonogen Developer—Collodion Dry Plates of High Sensitiveness—Table of Comparative Intensities of Various Illuminants.

A New Intensifying Method.—A method of intensifyiug a weak negative by which the actual silver image is not the least altered is described by Mr. R. E. Liesegang as follows: The varnished negative is coated with collodion or varnish in which a red or green aniline colour has been dissolved. Aniline colours, as it is known, are most sensitive to the action of light. After coating, the negative is exposed for some time to sunlight so that it acts through the glass plate, and through the negative film on the colour coating. At the parts where the latter has been exposed it bleaches, while it remains unaltered at the parts which have been less or not at all exposed, rendering the dark parts of the negative denser in exact relation. As, however, aniline colours cannot afterwards be made insensitive to light, the effect will disappear after the negative has been used for some time; but it is then only necessary to repeat the process of varnishing and exposing. Certain iron salts with development, as they are used in cyanotype, may be substituted for the aniliue colours, and then the intensification will be permanent.

Combined Hydroquinone and Eikonogen Developer.—It has been found that in mixing the hydroquinone with the eikonogen developer a combination is produced which is superior to the single developers; it acts as powerfully as eikonogen without fogging the shadows, and yields the characteristic intensity of hydroquinone. I have found this experience confirmed in my own practice. The combined developer I use is the following:—

Sodium sulphite	100 grammes
Eikonogen	15 ,,
Hydroquinone	5 ,,

are dissolved hot in

Water	1000 c.c.

After cooling down,

Carbonate of potassium	50 grammes

are added to the solution. In well stoppered bottles the developer keeps well for months. It may be mentioned here that Mr. Eugen Himly has of late made experiments with glycerine added to the eikonogen developer, and that he has found confirmation of the fact which was first pointed out in this journal by Mr. F. Goldby, that the keepiug qualities of the concentrated eikonogen developer are much improved by the addition of glycerine. Capt. Himly recommends the following composition:—

Water	1000 c.c.
Glycerine	100 ,,
Potassium metabisulphite	2 grammes
Sodium bisulphite	75 ,,
Eikonogen	12 ,,
Carbonate of potassium	60 ,,

I have tried to complete this by the addition of—

Hydroquinone	4 grammes

which gives an excellent combined developer, of the keeping qualities of which I can only say that a solution prepared six weeks ago is still entirely unaltered. The addition of yellow prussiate of potash to the above concentrated developer gives good results, according to the statement of Capt. Himly. It acts not only as a preservative, but it is said to give also more contrast in the high lights, and clearer shadows, and also to prevent fog. The formula remains the same as above, with the addition of

Yellow prussiate of potash ... 40 grammes

The developing solution may be used either concentrated, or diluted with one to two of its volume of water. For travelling purposes the bulk of the stock solution may be diminished by taking the quantity of the water as given in the above formula, and doubling the quantities of all the other components. The development may be accelerated by the addition of a few drops of caustic potash or caustic soda solution (1:10). Finally, a very good developer may be given here which was recommended at the last meeting of the Photographic Society of Frankfort-on-Maine, by its chairman, Mr. T. H. Voigt:—

No. 1.—*Stock Solution.*

Water	800 c.c.
Sodium sulphite	160 grammes
Hydroquinone	20 ,,
Potassium carbonate	230 ,,

No. 2.

In a dropping tube are poured—

Alcohol	60 c.c.
Glycerine	10 ,,
Pyro (dry)	10 grammes

For use, 50 c.c. of water, 10 c.c. of solution No. 1, and 5 to 10 drops of solution No. 2 are mixed. The stock solution keeps well.

Collodion Dry Plates of High Sensitiveness.—After seven years' work and several thousands of experiments, Mr. Gaedicke has at last succeeded in preparing permanent and highly sensitive collodion dry plates, which combine with the sensitiveness and the keeping qualities of a gelatine dry plate all the well-known advantages of a wet collodion plate. Mr. J. Gaedicke is an investigator of high reputation, and we are indebted to him for many a useful improvement and invention, so that we may have full confidence in his new successful work, which he announced at the last meeting of the German Society of Amateur Photographers of Berlin. The following are some of the qualities which the inventor claims for his collodion dry plates: As to the permanence, his experience extends to six months, during which period the plates have kept unaltered, and in his opinion there is no reason to doubt a further permanency. The plates may be developed six weeks (and probably even a much longer time) after they have been exposed. The sensitiveness of these plates is that of a gelatine plate of average sensitiveness. They are prepared exclusively colour-sensitive. The film is very thin, and rich in silver, and in the dry state it is very easily injured, so that it requires careful manipulation. After fixing, however, in the wet state it is so tough that it can be safely rubbed over with the finger. The treatment of the plates is the following: After exposure, the plate is placed in a dish containing clean water, and the film is allowed to soak for a minute. Then the water is poured away and the developer poured on the plate. An old, repeatedly used hydroquinone developer, to which about one-tenth of its volume of freshly prepared hydroquinone developer has been added, serves well. The image appears within six to twenty seconds, according to the exposure, and after one to two minutes the development will be completed. The plate is now thoroughly rinsed, and placed in an ordinary hypo solution for one-half to one minute. It is then rinsed again, washed for about five minutes in several changes of water, and can then be dried and varnished. The following are the advantages which the inventor claims for his plates in comparison to gelatine plates: In consequence of the thin film the image is sharper; the deposit is of a finer grain; the time of exposure offers a greater latitude, so that it is difficult to over-expose; the processes of development, fixing, washing, and drying are much shortened; the time required for printing is only about one-half; the negatives keep better; the preparation and the development are independent of the season and of the climate, since the film is insoluble in water. Mr. Gaedicke promised to give further particulars, and he said that he would prefer to have the plates prepared abroad, since in his experience inventions of this kind are more acknowledged abroad than in Germany.

Table of Comparative Intensities of Various Illuminants.—Mr. Alexander Lainer publishes in the *Correspondenz* an interesting and important treatise on tables of comparative exposures, in which he compares the tables of artificial illuminants contained in the book, "Le Temps de Pose," by M. de la Baume Pluvinel, with that published by Prof. Eder in his Year-Book. For this purpose he converted the latter into comparative exposures, taking the sunlight with 60,000 candles as unit.

Table of Comparative Exposures of Various Illuminants.

Sunlight	1
Electrical light of a dynamo: Arc light	10—46
Electrical light of a dynamo: Ordinary arc light	150—300
Electrical light of a dynamo: Incandescent light (Edison or Swan)	3000—6000
Light of 40 Grove cells	166
,, 48 Bunsen ,, ...	158
Limelight (oxygen and house gas, ordinary pressure)	666—2608
Limelight under 3½ atmosph. pressure ...	75·1
Magnesium wire, 0·3 mm.	811
,, ,, stronger	300—600
Oil lamp	5454—6000
Gas lamp (fish-tail burner)	6000—10·000
,, (Argand burner)	3530—3750
Petroleum lamp (flat burner)	1200
,, ,, (round burner, 15 mm. diam.)	9231
,, ,, (,, ,, 25 ,, ,,)	4286
Siemens' regenerative round burner ...	600—666
Standard wax candle, or paraffin candle ...	60·000
Tallow candle...	66 666—85·714

Mr. Lainer thinks that this table agrees much more with the actual circumstances than that compiled by M. Pluvinel.

A MOVEMENT is on foot, originating at a meeting of the Meteorological Society of Berlin, to take *simultaneous* photographs of flashes of lightning from widely different points of view, during this summer, with a view to obtaining a more accurate knowledge than now exists as to the length and direction of each flash.

A NEW and rather surprising use, says *Anthony's Bulletin*, has been discovered and patented by Mr. C. H. Koyl, of Euston, Pa., for celluloid. By silvering the back of a sheet of this material, Mr. Koyl has succeeded in producing a looking-glass which is not only of excellent quality, but is much less destructible, and has also the advantage of being bent or formed into almost any shape.

THE PHOTOGRAPHIC IMAGE.*

BY PROFESSOR RAPHAEL MELDOLA, F.R.S., M.R.I.

THE photographic film of the present time is a gelatino-haloid (generally bromide) emulsion. If a solution of silver nitrate is added to a solution of potassium bromide and the mixture well shaken, the silver bromide coagulates, and rapidly subsides to the bottom of the liquid as a dense, curdy precipitate. [Shown.] If instead of water we use a viscid medium, such as gelatine solution, the bromide does not settle down, but forms an emulsion, which becomes quite homogeneous on agitation. [Shown.] This operation, omitting all details of ripening, washing, &c., as well known to practical photographers, is the basis of all the recent photographic methods of obtaining negatives in the camera. The use of this invaluable vehicle, gelatine, was practically introduced by R. L. Maddox in 1871, previous experiments in the same direction having been made by Gaudin (1853-61). Such a gelatino-bromide emulsion can be spread uniformly over any substratum—glass, paper, gelatine, or celluloid—and when dry gives a highly sensitive film.

The fundamental problem which fifty years' experience with silver haloid films has left in the hands of chemists is that of the nature of the chemical change which occurs when a ray of light falls on such a silver salt. Long before the days of photography—far back in the sixteenth century—Fabricius, the alchemist, noticed that native horn silver became coloured when brought from the mine and exposed. The fact presented itself to Robert Boyle in the seventeenth century, and to Beccarius, of Turin, in the eighteenth century. The change of colour undergone by the chloride was first shown to be associated with chemical decomposition in 1777, by Scheele, who proved that chlorine was given off when this salt darkened under water. I can show you this in a form which admits of its being seen by all. [Potassium iodide and starch paper were placed in a glass cell with silver chloride, and the arrangement exposed to the electric light till the paper had become blue.] The gas which is given off under these circumstances is either the free halogen, or an oxide or acid of the halogen, according to the quantity of moisture present and the intensity of the light. I have found that the bromide affects the iodide and starch paper in the same way, but silver iodide does not give off any gas which colours the test paper. All the silver haloids become coloured on exposure to light, the change being most marked in the chloride, less in the bromide, and least of all in the iodide. The latter must be associated with some halogen absorbent to render the change visible. [Strips of paper coated with the pure haloids, the lower halves brushed over with silver nitrate solution, were exposed.] The different degrees of colouration in the three cases must not be considered as a measure of the relative sensitiveness; it simply means that the products of photo-chemical change in the three haloids are inherently possessed of different depths of colour.

From the fact that halogen in some form is given off, it follows that we are concerned with photo-chemical decomposition, and not with a physical change only. All the evidence is in favour of this view. Halogen absorbents, such as silver nitrate on the lower halves of the papers in the last experiment, organic matter, such as the gelatine in an emulsion, and reducing agents generally, all accelerate the change of colour. Oxidising and halogenising agents, such as mercuric chloride, potassium dichromate, &c., all retard the colour change. [Silver chloride paper, painted with stripes of solutions of sodium sulphite, mercuric chloride, and potassium dichromate, was exposed.] It is impossible to account for the action of these chemical agents except on the view of chemical decomposition. The ray of light falling upon a silver haloid must be regarded as doing chemical work; the vibratory energy is partly spent in doing the work of chemical separation, and the light passes through a film of such haloid partly robbed of its power of doing similar work upon a second film. It is difficult to demonstrate this satisfactorily in the lecture-room, on account of the opacity of the silver haloids, but the work of Sir John Herschel, J. W. Draper, and others, has put it beyond doubt that there is a relationship of this kind between absorption and decomposition. It is well known, also, that the more refrangible rays are the most active in promoting the decomposition in the case of the silver haloids. This was first proved for the chloride by Scheele, and is now known to be true for the other haloids. It would be presumption on my part, in the presence of Captain Abney, to enlarge upon the effects of the different spectral colours on these haloids, as this is a subject upon which he can speak with the authority of an investigator. It only remains to add that the old idea of a special "actinic" force at the more refrangible end of the spectrum has long been abandoned. It is only because the silver haloids absorb these particular rays that the blue end of the spectrum is most active in promoting their decomposition. Many other instances of photo-chemical decomposition are known in which the less refrangible rays are the most active, and it is possible to modify the silver haloids themselves so as to make them sensitive for the red end of the spectrum.

The chemical nature of the coloured products of photo-chemical decomposition is still enshrouded in mystery. Beyond the fact that they contain less halogen than the normal salt, we are not much in advance of the knowledge bequeathed to us by Scheele in the last century. The problem has been attacked by chemists again and again, but its solution presents extraordinary difficulties. These products are never formed—even under the most favourable conditions of division, and with prolonged periods of exposure—in quantities beyond what the chemists would call "a mere trace." Their existence appears to be determined by the great excess of unaltered haloid with which they are combined. Were I to give free rein to the imagination, I might set up the hypothesis that the element silver is really a compound body invariably containing a minute percentage of some other element, which resembles the compound which we now call silver in all its chemical reactions, but alone is sensitive to light. I offer this suggestion for the consideration of the speculative chemist.* For the coloured product as a whole, *i.e.*, the product of photo-decomposition with its combined unchanged haloid, Carey Lea has proposed the convenient term "photo-salt." It will avoid circumlocution if we

* Continued from page 558.

* I have gone so far as to test this idea experimentally in a preliminary way, the result being, as might have been anticipated, negative. Silver chloride, well darkened by long exposure, was extracted with a hot saturated solution of potassium chloride, and the dissolved portion, after precipitation by water, compared with the ordinary chloride by exposure to light. Not the slightest difference was observable either in the rate of colouration or in the colours of the products. Perhaps it may be thought worth while to repeat the experiment, using a method analogous to the "method of fractionation" of Crookes.

adopt this name. The photo-salts have been thought, at various times, to contain metallic silver, allotropic silver, a sub-haloid, such as argentous chloride, &c., or an oxy-haloid. The free metal theory is disposed of by the fact that silver chloride darkens under nitric acid of sufficient strength to dissolve the metal freely. The acid certainly retards the formation of the photo-salt, but does not prevent it altogether. When once formed, the photo-chloride is but slowly attacked by boiling dilute nitric acid, and from the dry photo-salt mercury extracts no silver. The assumption of the existence of an allotropic form of silver insoluble in nitric acid cannot be seriously maintained. The sub-haloid theory of the product may be true, but it has not yet been established with that precision which the chemist has a right to demand. We must have analyses giving not only the percentage of halogen, but also the percentage of silver, in order that it may be ascertained whether the photo-salt contains anything besides metal and halogen. The same may be said of the oxyhaloid theory: it may be true, but it has not been demonstrated.

The oxyhaloid theory was first suggested by Robert Hunt* for the chloride: it was taken up by Sahler, and has recently been revived by Dr. W. R. Hodgkinson. It has been thought that this theory is disposed of by the fact that the chloride darkens under liquids, such as hydrocarbons, which are free from oxygen. I have been repeating some of these experiments with various liquids, using every possible precaution to exclude oxygen and moisture; dry silver chloride heated to incipient fusion has been sealed up in tubes in dry benzene, petroleum, and carbon tetrachloride, and exposed since March. [Tubes shown.] In all cases the chloride has darkened. The salt darkens, moreover, in a Crookesian vacuum.† By these experiments the oxychloride theory may be scotched, but it is not yet killed; the question now presents itself, whether the composition of the photo-salt may not vary according to the medium in which it is generated. Analogy sanctions the supposition that when the haloid darkens under water or other oxygen-containing liquid, or even in contact with moist or dry air, that an oxychloride may be formed, and enter into the composition of the photo-salt. The analogy is supplied by the corresponding salt of copper, viz., cuprous chloride, which darkens rapidly on exposure. [Design printed on flat cell filled with cuprous chloride by exposure to electric light.] Wöhler conjectured that the darkened product was an oxychloride, and this view receives a certain amount of indirect support from these tubes [shown], in which dry cuprous chloride has been sealed up in benzene and carbon tetrachloride since March; and although exposed in a southern window during the whole of that time, the salt is as white as when first prepared. Some cuprous chloride sealed up in water, and exposed for the same time, is now almost black. [Shown.]

When silver is precipitated by reduction in a finely divided state in the presence of the haloid, and the product treated with acids, the excess of silver is removed and coloured products are left which are somewhat analogous to the photo-salts proper. These coloured haloids are also termed by Carey Lea photo-salts, because they present many analogies with the coloured products of photo-chemical change. Whether they are identical in composition it is not yet possible to decide, as we have no complete analyses. The first observations in this direction were published more than thirty years ago in a report by a British Association Committee*, in which the red and chocolate coloured chlorides are distinctly described. Carey Lea has since contributed largely to our knowledge of these coloured haloids, and has at least made it appear highly probable that they are related to the products formed by the action of light. [Red photo-chloride and purple photo-bromide and iodide shown.]

(To be continued.)

* "Researches on Light." 2nd ed. 1854, p. 80.

† Some dry silver chloride which Mr. Crookes has been good enough to seal up for me in a high vacuum, darkens on exposure quite as rapidly as the dry salt in air. It soon regains its original colour when kept in the dark. It behaves, in fact, just as the chloride is known to behave when sealed up in chlorine, although its colour is, of course, much more intense after exposure than is the case with the chloride in chlorine. The tube in which the chloride had been sealed up in benzene, gave off a considerable quantity of hydrogen chloride on breaking the point in June.

Patent Intelligence.

Applications for Letters Patent.

10,480. J. NOCK, 15, Regent Street, Barnsley, "Optical Illusions."—July 7th.

10,506. C. J. TOZER, 54, Fleet Street, London, "Device for Displaying Photographs on Gravestones or Vaults."—July 7th.

10,545. H. P. TATTERSALL, 11, Exchange Street, Blackburn, "Self-capping Shutter."—July 8th.

10,635. J. W. SMITH, 46, Lincolns Inn Fields, London, "Photographic Shutters."—July 9th.

10,719. F. R. GIBBON, 36, Deronda Road, Herne Hill, London, "Changing Box and Slide."—July 10th.

10,835. J. P. BAYLY, 18, Fulham Place, London, (Charles Bishop, U.S.) "Displaying Stereoscopic Views."—July 12th.

10,871. A. TOUFFREVILLE, 323, High Holborn, London, "Automatic Photographic Machines."—July 12th.

10,933. D. WEBB, 70, Market Street, Manchester, "Coloured Dioptric and other Lenses."—July 14th.

10,955. W. F. KLEIN, 54, Fleet Street, London, "Lenses."—July 14th.

11,004. R. TIMPERLEY, Central Chambers, Halifax, "Automatically Exhibiting Photographs."—July 15th.

11,071. A. WATT, 89, Hartington Road, Liverpool, "Apparatus for Developing without a Dark Room."—July 16th.

11,093. H. L. SWORDER, 27, Southampton Buildings, London, "Holder to Facilitate Plate Washing."—July 16th.

11,104. E. EDWARDS, 35, Southampton Buildings, London (OSWALD MOH, Germany), "Preparing Photographic Plates of Mica."—July 16th.

11,125. G. WISHART, Bushy Hill, Cambuslang, "Folding Tripod Stands."—July 17th.

11,250. W. H. KEEP and W. MCENTEE, 20, High Holborn, London, "Removing Prepared Lithographic or Zincographic Surfaces."—July 18th.

11,287. C. JUDSON, 11, Southampton Buildings, London, "Toy for Producing Optical Effects."—July 19th.

11,293. J. E. THORNTON, 3, New Lorne Street, Manchester, "Cameras."—July 19th

* These results were arrived at in three ways. In one case hydrogen was passed through silver citrate suspended in hot water, and the product extracted with citric acid. "The result of treating the residue with chlorhydric acid, and then dissolving the silver by dilute nitric acid, was a rose-tinted chloride of silver." In another experiment the dry citrate was heated in a stream of hydrogen at 212° F., and the product, which was partly soluble in water, gave a brown residue, which furnished "a very pale red body on being transformed by chlorhydric and nitric acids." In another experiment silver arsenite was formed, this being treated with caustic soda, and the black precipitate then treated successfully with chlorhydric and nitric acids: "Silver is dissolved, and there is left a substance . . . . [of] a rich chocolate or maroon, &c." This, on analysis, was found to contain 24 per cent. of chlorine, the normal chloride requiring 24·74, and the sub-chloride 14·08 per cent. The committee which conducted these experiments consisted of Messrs. Maskelyne, Hadow, Hardwich, and Llewelyn. B.A. Rep. 1859, p. 103.

Specifications Published.

12,309. *August 2nd*, 1889.—"Treatment of Paper or other Fabrics to Render them suitable for Photographic Purposes." JAMES WILLIAMS, Willesden Paper Works, Willesden Junction, Middlesex, Chemist.

Paper is at the present time treated by dipping in an ammoniacal solution of oxide of copper (cuprammonium hydro-oxide) in the manufacture of the well-known Willesden waterproof paper. Such paper has, however, comparatively rough surfaces unless glazed with roller pressure.

Paper and textile fabrics have also been glazed by applying a coating of cellulose dissolved in cuprammonium hydro-oxide, but, owing to the manner in which this was done, the resulting surface was not suitable for photographic purposes.

I have discovered that instead of dissolving cellulose in cuprammonium, it is essential to success to first prepare a bath of strong cuprammonium hydro-oxide solution, which must be of the utmost possible purity, and I find it convenient to use from 1·5 to 2·5 per cent. by weight of metallic copper, according to the degree of brilliancy required. Upon this bath I float the surface of the paper or other fabric to be treated, taking care that only one side comes in contact with the solution, by which means I convert the surface of the paper or other fabric into a structureless film of cellulose, such film at this stage existing in combination with the oxide of copper, ammonia, and water employed. I then conduct the sheet of paper or other fabric, with as little exposure as possible to the air consistent with the setting of the film, to one or more hot rollers, taking care to lead it over the first, so that the untouched surface is in contact with it, by which means I expel the ammonia and water from the deposited film.

The material thus treated has a green tint, due to the copper hydrate contained in the deposited film. In order to remove this and render it suitable for photographic purposes, I pass it through consecutive baths of weak acid, such as sulphuric acid, which dissolves out the copper without affecting the glazed surface. I then wash and dry the paper or other fabric.

By this invention a permanent glaze, capable of withstanding the action of water, steam, weak acids, alkalies, and ordinary solvents, and with a surface closely resembling the albumenised paper used in photography, is obtained.

In place of cuprammonium hydro-oxide, other suitable solvents may be used.

What I claim is:—

1. The process of forming a practically pure, structureless film of cellulose upon the surface of paper or other fabric, by exposing it to the action of a solvent, and then removing or neutralising such solvent.

2. The process of forming a practically pure, structureless film of cellulose upon paper or other fabric, by floating the paper or other fabric upon the surface of a solvent, and then extracting or neutralising such solvent.

3. The process of forming a practically pure, structureless film of cellulose upon the surface of paper or other fabric, by exposing it to the action of cuprammonium hydro-oxide, and afterwards to acid.

4. The process of forming a practically pure, structureless film of cellulose upon the surface of paper or other fabric, by floating the paper or other fabric upon the surface of cuprammonium hydro-oxide, and afterwards exposing it to the action of acid.

5. The treatment of paper or other fabrics to render them suitable for photographic purposes.

14,508. *Sept. 14th*, 1889.—"Applying Luminous Preparation to Paper." JAMES ALBERT CAUSTON, of the firm of Sir Joseph Causton and Sons, 9, Eastcheap, London, Printer, and James Challis, of 9, Eastcheap, London, Commercial Traveller.

Our improved process consists in printing any design or pattern in an adhesive composition, such as gold size or mucilage, upon paper or other substance from type, blocks, or lithographic stones by an ordinary printing press or otherwise; and, while the design is still wet or tacky, dusting or flocking upon it a layer of the chemical compound known as luminous powder, which has the property of absorbing rays of light and afterwards emitting them in the dark; being the acting ingredient in the well-known luminous paint, and composed of sulphur and lime.

To obtain a greater body of the luminous powder, we sometimes mix a portion of it with the mucilage used in printing the design, and afterwards dust on the powder. The non-luminous portions of the design are printed in the usual manner.

We are aware that luminous designs have been produced by painting, and also by washing or coating the entire surface with luminous paint, and stopping out the required non-luminous portion by printing or otherwise. These methods, however, involve a very large consumption of the luminous compound, while the effect obtained both on the luminous and the stopped-out portions is extremely coarse; whereas, by our improved process, we can produce designs of very great delicacy and beauty with the least possible expenditure of material.

18,139. *November 13th*, 1889.—"Apparatus for Facilitating the Microscopical Examination of Photographs." HENRY DUNCAN, 16, Tokenhouse Yard, London, Stockbroker.

My invention relates to apparatus for facilitating the microscopical examination of photographic pictures, maps, and documents, and other small or microscopic objects.

My said invention is chiefly designed to afford the means whereby photographic miniatures of maps or the like, which, while occupying a comparatively small space, correspond to a very large area, can be easily examined.

My said invention is particularly serviceable to bicyclists and tourists, and for military and other purposes where ordinary maps would be objectionable by reason of their bulk, or by reason of the difficulty of using them, particularly in stormy or wet weather.

An important feature of my said invention is the provision of suitable means whereby the microscope may be readily adjusted relatively to the map or other object, so that any desired section of the said map or other object can be brought into the field of the said microscope. By this means, with a comparatively small lens, it is possible to examine objects which, as a whole, occupy an area very much larger than the field of such lens. For example, any desired part of a small scale map showing an area of, say, three or four hundred square miles may be examined by adjusting the microscope as required.

In making a portable apparatus according to my said invention, I arrange the lens or lenses in a suitable tube or holder capable of sliding in a disc or other piece fitted to rotate in or upon the frame of the map, picture, or the like; or I provide other suitable means for adjusting the lens or lenses in any direction relatively to the said map, picture, or the like for the purpose above specified.

The tube carrying the lens or lenses is sometimes arranged to slide into and out of the main portion of the apparatus.

The map or the like is preferably photographed on a greatly reduced scale on a disc of glass which will fit into a suitable case or holder provided with a removable cover, and is protected with another disc of glass secured to the first disc in any convenient manner. I sometimes so construct these discs as to prevent rotation of the same in their case or holder; for example, I form notches in them to engage with a stud or projection in the holder. I can, if desired, provide the apparatus with any desired number of interchangeable maps, pictures, or the like mounted in this manner.

A stud or projection is sometimes provided on the said frame to facilitate the use of the apparatus by indicating which is the top or north of the map. This stud or projection, moreover, engages with a notch in the cover of the holder for the map or the like, and prevents rotation of the said cover relatively to the said holder.

In some cases I make the map or other object adjustable while keeping the lens fixed, so that different parts of the said map or the like can be brought into the field of the said lens, or both the lens and the object may be made adjustable relatively to each other.

6,093. *April 22nd*, 1890.—"A Photographic Camera." John Merritt, 842, President Street, and William Edward Spencer, 293, Dekalb Avenue, Brooklyn, State of New York, Physicians.

This patent is inexplicable without the aid of mechanical drawings, and has fifteen claims.

Correspondence.

EXPOSURE AND DEVELOPMENT.

Sir,—In your report of the last meeting of the Hackney Photographic Society your printer has substituted "on glass" for "in glens;" the sentence should read "Preferred dull weather when photographing *in glens*."

As some little misunderstanding might arise about the development of an isochromatic plate by candle-light, permit me to point out that I used the developing dish designed by myself, which has a transparent ruby glass bottom, with a well at one end to hold developer when the dish is held upright. By this means it is unnecessary to remove the plate from the developing dish to examine it for density, or to pour off the developer. This prevents bubbles in the developer and staining of fingers, as it is not necessary to touch the plate at all until development is complete and the solutions washed off. The ruby glass bottom prevents the light from reaching the back of plate when examining for density, my experience proving that plates are mostly fogged in this way. As to the glass side of the film it remains sensitive, whereas the surface of film is partly protected by the developer and the reduced image.

Birt Acres.

BRIXTON AND CLAPHAM CAMERA CLUB.

Sir,—Can you spare a corner in this week's issue to announce that in future we meet at Gresham Hall, Gresham Road, Brixton, S.W., opening there on Thursday, 31st inst., and that we shall be glad to see any photographers residing in the neighbourhood on that occasion, or at any of our meetings? Thanking you in anticipation, F. W. Levett, *Hon. Sec.*

126, *Lowden Road, Herne Hill, S.E., 21st July.*

Proceedings of Societies.

Photographic Society of Great Britain.

The monthly technical meeting of this Society was held on July 22, Mr. T. Sebastian Davis in the Chair.

A set of photographs from paintings of eminent masters amongst musical composers was received from an establishment at Munich.

An illustration of photographic enterprise was narrated by Mr. L. Warnerke. A photographer in the Isle of Wight was in the habit of posting himself at a stopping place of the Ventnor coach, and photographing the vehicle and passengers at about eleven o'clock in the morning, and by five in the afternoon, on the return journey, the passengers were met with a supply of mounted prints made from the negative taken only a few hours earlier.

An enquiry being made as to the character of Watkins' exposure meter, Mr. Chapman Jones said that a description of it would be found in the *Journal of Chemical Industry*.

The Chairman asked what would be considered a fair time to expect commercial sensitised paper to keep in good condition?

Mr. W. E. Debenham said that there were two causes which operated to spoil sensitised paper. One cause was the influence of an impure atmosphere, such as that of large cities. It must not be expected that silver paper could be prepared to resist this influence. The other cause was the inherent constitution of the sensitised paper itself. It was this that the manufacturer could influence. Paper must therefore be judged by its ability to keep in good condition if well preserved from the atmosphere. There were also two kinds of deterioration, discolouration, and a change which prevented the paper from taking a rich and satisfactory tone. He had noticed that with paper kept loose this change had come on before there was any serious discolouration.

Mr. Chapman Jones had found paper keep better, as far as freedom from discolouration is concerned when loose in a box than when rolled up.

Mr. Warnerke had some sensitised paper which was more than two years old. It had been kept wrapped in tinfoil, and was as good as at first, with the exception of the outside sheet, which was spoiled.

Mr. A. Cowan had found paper keep perfectly good when placed between folds of blotting-paper that had been prepared with a solution of common washing soda and dried.

Mr. Warnerke had used in this way paper treated with potassium nitrite.

Mr. J. R. Gotz considered that the influence of impure atmosphere was very strong in spoiling sensitised paper. He had known paper to keep perfectly good for two years at a country place in Shropshire, whilst in Sheffield as many months sufficed to spoil it.

The Chairman said that it would be an advantage if albumenisers would prepare paper in other and larger sizes than the one now exclusively adopted. There would be no difficulty in getting the paper from the mills.

Mr. Gotz then exhibited McKellan's new magazine hand-camera, and showed its working, which appeared to be simple and satisfactory.

London and Provincial Photographic Association.

At the meeting on the 17th inst. Mr. F. A. Bridge occupied the chair.

Mr. S. T. Chang was elected a member.

Mr. J. R. Gotz exhibited some half-plate negatives taken on Obernetter films; the substratum of these films is hardened gelatine. Mr. Gotz said the treatment of these films was similar to others. After washing, they were transferred to a bath containing a little spirits of wine and about 7 per cent. of glycerine, in which they were allowed to remain about half an hour, and then dried between sheets of blotting-paper. He also passed round some prints on Obernetter paper with a matt surface.

Mr. A. Haddon said that at a former meeting Mr. Hastings had shown some prints on Reynolds' iridium paper. He had subjected a piece of this paper to various tests, but was unable to trace any iridium.

The report of the delegates appointed by the Association to attend the Convention at Chester was given by Mr. A. Haddon.

The subject for discussion on the 31st inst. will be "Outdoor Portraiture."

Newcastle-on-Tyne and Northern Counties Photographic Association.

July 15th.—Mr James Brown in the chair. About forty members were present.

Mr. H. M. Smith, of the Eastman Company, attended to exhibit and explain the kodak and new rollable transparent film. In introducing his subject, Mr. Smith said he would naturally be expected to refer to the attacks which had been made upon the kodak, and, in fact, he was there partly for that very purpose. He emphatically protested against anonymous and erroneous statements which had appeared in one of the photographic papers, and he especially invited the writer who signed himself "Newcastle" to come forward, if present, and argue the matter out; an invitation which, however, was not responded to. It was the intention of the Company, whenever the identity of a correspondent could be established, to go boldly to him and afford every facility for the settlement of disputed points. Had any of these anonymous gentlemen given the most cursory examination to the kodak, they would have found that the lens is not a single non-achromatic; and as to price, that was entirely a matter between buyer and seller. He wished to state, in as public a manner as possible, that in the No. 1 kodak the lens was not a single but a periscopic—a doublet lens. It was not achromatised, but was

placed so as to work at its chemical focus, and he could appeal to results to show its quality. With the sole exception of the No. 1, all the other forms of kodak sent out by his Company were fitted with rapid rectilinear lenses made by one of the principal firms of lens makers in America, and they would bear comparison with any in the market. The focus of the quarter-plate was five and a quarter inches, and the 5 × 4 six and a half inches, and all were capable of adjustment to various distances. Results of exposures taken in the kodak during the Convention were passed round, some hand exposures and others with a tripod, as well as enlargements from the same negatives. It was intended to demonstrate the development of the films, but time did not admit.

After remarks from Messrs. Dunn, Park, Pike, Hemy, the Chairman, and others, a vote of thanks was accorded to Mr. Smith for his address.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE excursion on the 18th to Tintern was attended by a few members, including Mr. E. Brightman. The weather was fine, and some good work was done.

On the Saturday following (the 21 inst.) a large number of members went for a day's photography and pleasure to Keynsham and Saltford, in response to the invitation of the president, Mr. H. A. H. Daniel. The party left the train at Keynsham, where they visited the interesting Parish Church, and were thence driven by Mr. Daniel to Keynsham Manor House, where they were hospitably regaled before proceeding farther. Return was made to Keynsham Manor in the late afternoon. Mr. Boyden took an excellent group before the party dispersed.

Raglan was settled on for the July excursion, which was arranged to take place on Saturday, the 26th, the journey being made on the previous evening.

A resolution of regret was passed by the members present at the announcement of the death, after a rather sudden illness, of Mr. E. S. Walsh, a member of the Society.

A CARBON PROCESS.—Mr. O. Volkner publishes the following dust carbon printing process, which appears to be easy to carry out, requires no reversed negatives, and yields permanent prints. We also think it can be used in making phototypic printing blocks. Make a solution of gelatine in water (1:60) and draw sheets of good strong paper through it, and hang it up to dry. Wet it again and squeeze it down on a piece of glass. Now brush over it a solution of ten parts gelatine, ten parts gum arabic, twenty parts white sugar, eighty parts distilled water. While still quite moist, put it in a dusting box (such as used for photogravure) which contains a mixture of 100 parts to white dry sugar and five parts of French lampblack. After a lapse of eight to ten minutes withdraw it, and you will find it covered with innumerable particles of dust. Paper thus prepared will keep, and has to be sensitised in a bath of fifty parts bichromate of potassium, fifty parts bichromate of ammonia, six thousand parts water and aqua ammonia, until it assumes a light yellow colour, and at last, to avoid the too quick dissolution of the gum arabic, immerse in twenty parts chromic acid in 1,500 alcohol. Print by Vogel's photometer 16° to 18°. To develop, use warm water first, and afterwards cold, leaving the print for several hours in water, to which may be added a little aqua ammonia, in case the printing was carried too far. The prints show a singular and very pleasing grain, and need no transferring.—*Dr. Eder's Jahrbuch.*

RECEIVED.—The catalogue of Mr. R. Abraham, whose business will in future be carried on under the name of Adams and Co. This catalogue begins with thirty-six pages of good literary matter on practical photographic subjects by Mr. Andrew Pringle and other good writers.——We have also received with thanks and suspended in the office, as requested, our coloured book-cover supplement, recently issued, neatly framed by Mr. W. F. Slater, of Southampton Street, Camberwell, as a specimen of his skill in the framing of photographs.

Answers to Correspondents.

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

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

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

COL. WATERHOUSE.—*Guaiacol Developer, &c.* We thank you for the letter dated 24th ult., and for the promise of further particulars, also for the memorandum sent. The change which you describe is not confined to India, but occurs in more temperate climates, and sometimes even in England.

H. S.—*Card Mounts.* Two cabinets received showing defects, the cause of which cannot be ascertained by mere inspection. We will look further into the matter and report to you later on.

FOCUS.—*Right of Reproduction.* Amongst amateurs who are friends, it is not likely that there can be any objection to the proposed course, which is intended as a personal compliment; but as a measure of courtesy you ought to apprise your absent colleague of the step you are taking, even though he, being at the antipodes, may not get to hear of it until after your copies are distributed. All depends upon the character of the individual, and the degree of intimacy subsisting between you. We have done so under similar circumstances without giving offence.

D. M.—*Eikonogen Development; German Formula.* The use of eikonogen introduces no new practice as regards the method of fixing the plates developed therewith. Bromide is supposed to have an influence by virtue of its exerting a slight solvent action upon the haloid salts of silver contained in the sensitive film; the same claim is made on behalf of the trace of hypo sometimes employed as an accelerator.

E. O. C. (Boston).—*Photo-Mechanical Processes.* In last week's NEWS you will have seen further references to Kiewning's and to Maschek's processes.

INQUIRER.—*Hygrometers.* The instrument figured and described at page 547 may not be altogether novel, but is probably much more delicate than the cat-gut hygrometer in frequent use. The wet and dry bulb thermometers may be depended upon to give correct indications; these are worked with Mr. Glaisher's tables.

L. P. (Yarmouth).—*Ferrous Oxalate.* Your letter is answered by reference to the concluding summary, which has now been published. See bottom of page 552.

TYRO.—*Brown Spots in Silver Prints.* The circular marks appear to be due to bubbles formed whilst the prints are in the fixing bath. The cure should be occasional lifting and more agitation in the hypo, with greater care in removing the excess of silver by preliminary washing.

S. D.—*Cockled Ebonite Shutter.* Try the effect of tying up the slide between two zinc plates, immerse in boiling water, and allow gradually to cool. It ought then to be permanently flattened.

J. M. S.—*Weather Forecasts.* From long observation and comparisons we should be inclined to put the "successes" rather lower than *two out of three*, and several of the later prophecies have been exceedingly unfortunate. Photographers are quite as much interested as the farmers in getting true indications, but we must wait for the progress of science, and hope for better results. America is fortunate in having a great continent and wide ocean to help their meteorological forecasts, which are nearly always right; whilst our insular position precludes the attainment of this degree of certainty, and with us, so far, they are about as often wrong as right.

W. C. N.—"*London Purple.*" We have never known Magenta residues to be called by this name, but from them may be prepared Ruby Powder, which, in some respects, answers to your description.

RECEIVED.—Photargus, B. B. and Co., and E.B.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1665.—*August* 1, 1890.

CONTENTS.

THE WEIGHTS AND MEASURES USED BY PHOTOGRAPHERS IN AMERICA.

As it seems probable that the system of weights and measures used by British photographers will soon be the same as those employed in the rest of civilised Europe, it remains to be considered whether a variation from the general uniformity will be found in the United States of America. In relation to the weights and measures of the United States, Professor T. C. Mendenhall, the superintendent of the United States Coast and Geodetic Survey, recently delivered a long address to the Pharmacopœial Convention held at Washington; that address contained a mass of useful information on the subject now under notice.

Professor Mendenhall set forth that in the United States the old English system of weights and measures, resting upon no scientific basis, is in general use, and that, whilst within the last fifty years the English had somewhat improved their ancient system, the example had not been followed in his country. He said that the United States was one of the first nations to receive copies of the metre. During the French Revolution, the Committee on Safety, of which Robespierre was chairman, transmitted to the United States a copper metre and a copper kilogramme by order of the Committee, and this metre and kilogramme were placed in the national archives. In the archives of the United States Coast Survey Office is what is known as the Committee metre—an iron bar of great historic interest, as only three or four are now in existence. This is one of the fifteen iron bars which were prepared from a study of the metre, and was obtained very long ago. Professor Mendenhall added that in 1868 a law was passed by the Congress of the United States legalising the use of the metric system in that country, and establishing certain approximate relations between the metric and the customary systems. He said that he wanted to emphasise one fact which is not generally recognised in relation to this subject, and that is, that to-day the metre and the kilogramme are the only units that have been established by Congress for the whole country.

In the course of his address, he also set forth that in 1869 the French Government invited other governments to send delegates to Paris in order to attend the International Bureau of Weights and Measures, that they might agree on the construction of a new international metre. The old metre of the archives was still preserved, but it no longer possessed the great authority it formerly had, since its form was not recognised as coming up to the modern ideas of metrology. The French Government, therefore, concluded that it was time to construct a new metre which should be first in authority the world over.

The United States sent delegates, and in 1875 the International Bureau of Weights and Measures was organised by an International Convention. It was held in France; about twenty-five nations were represented, and the result of that was the introduction of a new prototype standard. Copies of this prototype standard were subsequently distributed to all the nations of the world who had participated in the Convention, and two of these copies went to the United States, two metres and two kilogrammes. One of these metres and one of these kilogrammes were carried over from Paris by Mr. Graham, of the Geodetic Survey, and were deposited in the archives of the Bureau of Weights and Measures. They bore the seal of the United States Minister at Paris, and of Prof. Davidson and Dr. Gould. On the 2nd day of January, 1890, these standards were taken to the Executive Mansion, to the Cabinet room, and were opened. The seals were broken by the President of the United States, witnessed by the Secretary of State and the Secretary of the Treasury, also by twenty or thirty distinguished scientific men. Models were constructed of these standards, and Professor Mendenhall exhibited one of them to the Convention, made of 90 per cent. platinum and 10 per cent. iridium, coated with aluminium. It is in the form of a bar, but it has a peculiar cross section of the form of the letter H, so that any stress that the bar may receive will be compensated for; a short distance from each end are fine lines, and they represent the length of the

metre. He also exhibited a model of the standard kilogramme composed of the same platinum-iridium alloy.

From this it seems that great attention is being paid just now in the United States to the metric system, and it may be inferred that the matter is likely to be considered without delay by photographers there, who are already displaying much interest in the steps recently taken in England in relation to the standardising of the mounts of lenses.

DARK ROOM COMFORTS.

It is a common belief that any place will do for a dark room for photographic purposes, and many men are content—sometimes, unfortunately, by compulsion—to utilize a cupboard under the stairs, or some other corner of the household where, to use a common but expressive term, "there is not room to swing a cat," for the purposes of development. We never yet met with a photographer who possessed any intense desire "to swing a cat," but all of us are desirous of sufficient room in our workshops to swing our own arms without the danger of smashing bottles or dishes in the process. The "cupboard" form of dark room is bad for other reasons, the chief being the want of ventilation, so that half-an-hour's work therein causes a feeling of exhaustion which is not always traced to the real cause. One pair of lungs soon vitiates the available oxygen in a small room, and if the process is helped by a lamp, which consumes a great deal more, the place soon becomes likened to the black hole of Calcutta.

We lately saw at the house of an ardent amateur photographer a very ingenious method by which his bath-room was transformed in two minutes into an effective dark room. The idea seemed to us to be so original in conception that we made a note of the arrangements, by leave of the owner, for the benefit of others. The bath was of the usual household type, with cold water laid on by an ordinary tap, and was placed immediately under a window through which the afternoon sun poured liberally into the room. The window had a vallance above it, and curtains on either side, and without close examination did not reveal any other fittings; but this window was really far more worthy of patenting than many photographic contrivances which are daily brought under our notice.

In the first place, it was fitted with a blind made of ruby medium, which was fastened to a roller like any other window blind. When pulled down the light in the room instantly changed to crimson, but there were, of course, gaps on each side through which treacherous, undiluted daylight still streamed in sufficient quantities to affect the least sensitive of photographic compounds. No light came in from beneath the blind, for it was made of such a length that its lower edge and lath came over the window ledge, and could be fastened there by a button in the wall.

But fixed to the outer edges of the window frame on each side, and hidden until required by the curtains, were two wings of black material (silesia) each about ten inches broad. These flaps were pulled over the edges of the blind, and two or three elastic tapes fastened to the edge of one of them found resting places on corresponding buttons sewn on the edge of the other one. In this way the window was quite obscured, while plenty of red light came into the room from the broad band of ruby medium that was left exposed right down its centre. With this clever makeshift the bath-room was changed into a red room with ease, and plates could be developed in comfort upon a wooden grid that was temporarily laid across under the tap. It is true that the interior of the bath bore traces of experiments with various developers, and the paint gave evidence of chemical discolouration, but this we should not have remarked had it not been pointed out to us by the fair lady of the house.

Where a bath room can be adapted in this way one great desideratum gained is a plentiful supply of water. The importance of this is not always recognised by photographers, and thereby many a good negative has been sacrificed. A properly fitted dark room should not only have a copious supply of this "staff" of modern photography—it was not of so much consequence in the days of collodion—but it should also have a large sized sink in which plates may be left with the water running upon them after the alum bath, as a final precaution against the enemy hypo.

The right choice of a dark room lamp is another matter upon which comfort much depends. When electricity is "laid on" to our houses that difficulty will be solved, for there is nothing better than a glow-lamp in a red lantern, or—as they will doubtless be supplied for photographic uses—with ruby glass bulbs of their own. In the meantime gas is, without doubt, the best thing to use where it is available. The lantern box in which it is contained should be large, and may conveniently be fitted with panes of different material, according to the work in hand. But perhaps the chief recommendation of gas is that it can readily be turned up or down, according to the amount of light which it is deemed safe to use with different varieties of plates.

There are many other points which greatly add to dark room comfort, too many, indeed, to discuss in detail, but one or two which are commonly neglected may be mentioned. Every bottle should be legibly labelled, and in the case of compounds, such as developers, the actual formula should be written at length on the label. The ability to fill a bottle afresh, without the necessity of hunting through several Year-Books to find the original formula, is a comfort indeed. A bottle of water, acidulated with hydrochloric acid, and a sponge, should be kept close to the sink in order to wash out dishes and measures after use; and we may mention in passing that the same sponge passed over a sheet of glass, followed by a good rinse under the tap, will give a chemically clean surface more quickly, perhaps, than any other agent. These are little things, but attention to such details leads to big things.

STEELING PHOTOGRAVURE PLATES.

In an illustrated pamphlet on "Photogravure," by W. T. Wilkinson, issued this week by Iliffe and Son, will be found thirty-two pages of reading matter, giving photographers information how to etch their own photogravure plates, and to print off impressions therefrom. The artistic effects producible by photogravure are now fully recognised, and it is not impossible that this process may play an important part in the professional photography of the future.

The pamphlet is clearly written, and likely to be useful. In it Mr. Wilkinson gives the following instructions for the steeling of the etched plates when large numbers of prints are required therefrom:—

"When the plate has been proved, the next operation will be to steel-face it, for which purpose it is thoroughly cleaned with whiting moistened with turpentine and naphtha, polishing with a soft cloth; a small portion of the plate behind is scraped clean, and a piece of copper wire soldered to it. The steeling solution is placed in a wooden cell, the positive and negative poles from the battery (Leclanche) ending in copper rods the whole length of the cell. The solution is composed of—

Warm water	... 20 ounces
Ammonium chloride	... 3 ,,
Sulphate of iron and ammonia ...	... 4 ,,

When dissolved, filter, and let it stand in the cell twenty-four hours before use. When required for use, the copper-plate is hung upon the rod connecting with the negative pole of battery, the positive pole being occupied by the anode (a plate of pure steel), which must be the same size or larger than the copper-plate. The two plates being in position, the current is turned on by pushing in the rod of battery, and in from three to five minutes the operation is complete, the copper-plate being covered by a very thin film of steel. The plate, when steel-faced, is thoroughly washed and dried, and then cleaned with whiting and turps and naphtha, the copper wire behind carefully unsoldered, and the back scraped flat. If the battery is not to be used again for some time the anode should be removed and wiped dry, the cell being carefully covered up."

A SUPPLEMENT TO THE "PHOTOGRAPHIC NEWS."

We desire to remind the readers of this Journal that on Friday, August 15th, a fine photo-etching, representing the house at Eversley of the late Charles Kingsley, will be issued as a Supplement to the Photographic News.

Clearing Collodion.—Collodion, which is often slow in settling and clearing after preparation, may, according to the *Photo. Archiv*, be entirely cleared by shaking it up with clear quartz sand. This carries the flocks and impurities to the bottom with it, and leaves the liquid above entirely clear.

Toning Gelatino-Chloride Paper.—The simplest toning bath for gelatino-chloride paper we have seen is that proposed by W. K. Burton, of Tokio, Japan; it is as follows:—

Hyposulphite of soda	... 3 ounces
Distilled water	... 20 ,,
Chloride of gold	... 6 grains

with the addition of three grains of nitrate of lead to preserve the whites. The above bath tones slowly, and does not give the richness produced by the sulpho-cyanide of ammonia formula, but will recommend itself to many on account of its simplicity.—*Wilson's Photographic Magazine.*

LIMITATIONS IN THE TREATMENT OF SUBJECTS BY FOCUS.*

BY W. K. BURTON.

It must be some year or two now since I wrote to your columns, pointing out what I considered to be a fallacy in a statement made by Mr. T. R. Dallmeyer in connection with the effect of reflection from the surfaces of lenses. Mr. Dallmeyer, at that time, replied to my communication that he intended to go into the matter thoroughly by the aid of drawings, and I have been ever since eagerly looking out for any farther word from him on the subject. I see an announcement in a photographic periodical that has just reached me that he is, at last, going to take the matter up. I therefore do not enter into this question at present farther than to say that if he, Mr. Dallmeyer, has not gone into the matter before he has seen this, he may hereby know that there is at least one person anxiously waiting to hear of his results.

I now come to say a word or two in reply to some remarks made by Mr. Dallmeyer in his recent paper read before the Camera Club Conference, entitled "Limitations in the Treatment of Subjects by Focus," in which he criticises some sayings of mine.

I cannot help thinking that Mr. Dallmeyer either wilfully misrepresents me, or has not understood the paper of mine that he refers to, "On One or Two Tenets of the Naturalists," and, as I cannot believe the former, I must believe the latter assumption, and assume that my paper was not clear. I therefore make a little farther explanation.

In the paper of mine referred to I stated that I believed the common statement, that the eye defines less perfectly than a good lens, to be a mistake. I should certainly have added that this is as far as refers to axial definition only. My authority is Lord Rayleigh who, unless I remember very imperfectly, some years ago demonstrated that the normal human eye gives central definition in one plane *as good as any lens is physically capable of giving*, but I have, unfortunately, not the means by me here to quote chapter and verse.

Mr. Dallmeyer contradicts my statement, and gives Helmholz as his authority; but he persistently ignores the whole point of my argument, to wit, that granted that the eye gives ever so much worse definition than a lens, there still should be in the image given by a photographic lens, so far as any scientific reasoning goes, one plane rendered as sharp as the lens is capable of rendering it; because, whatever falling off of definition due to imperfection in the eye there may be in looking at an object, there will be exactly the same falling off in looking at an image of the object made with a lens that gives *absolute* sharpness in one plane.

But I am repeating what I have already said several times, and doubtless weary your readers. If Mr. Dallmeyer really wishes to know what my views on the subject really are—and they are very different from his representation of them at the Camera Club Conference—I refer him to page 55 of the Year-Book for 1890, as I think that I there succeeded in expressing myself more clearly than I did in the paper I wrote for the Camera Club.

I now come to what is the real reason for my writing at the present time. It is a question in relation to diffusion of focus.

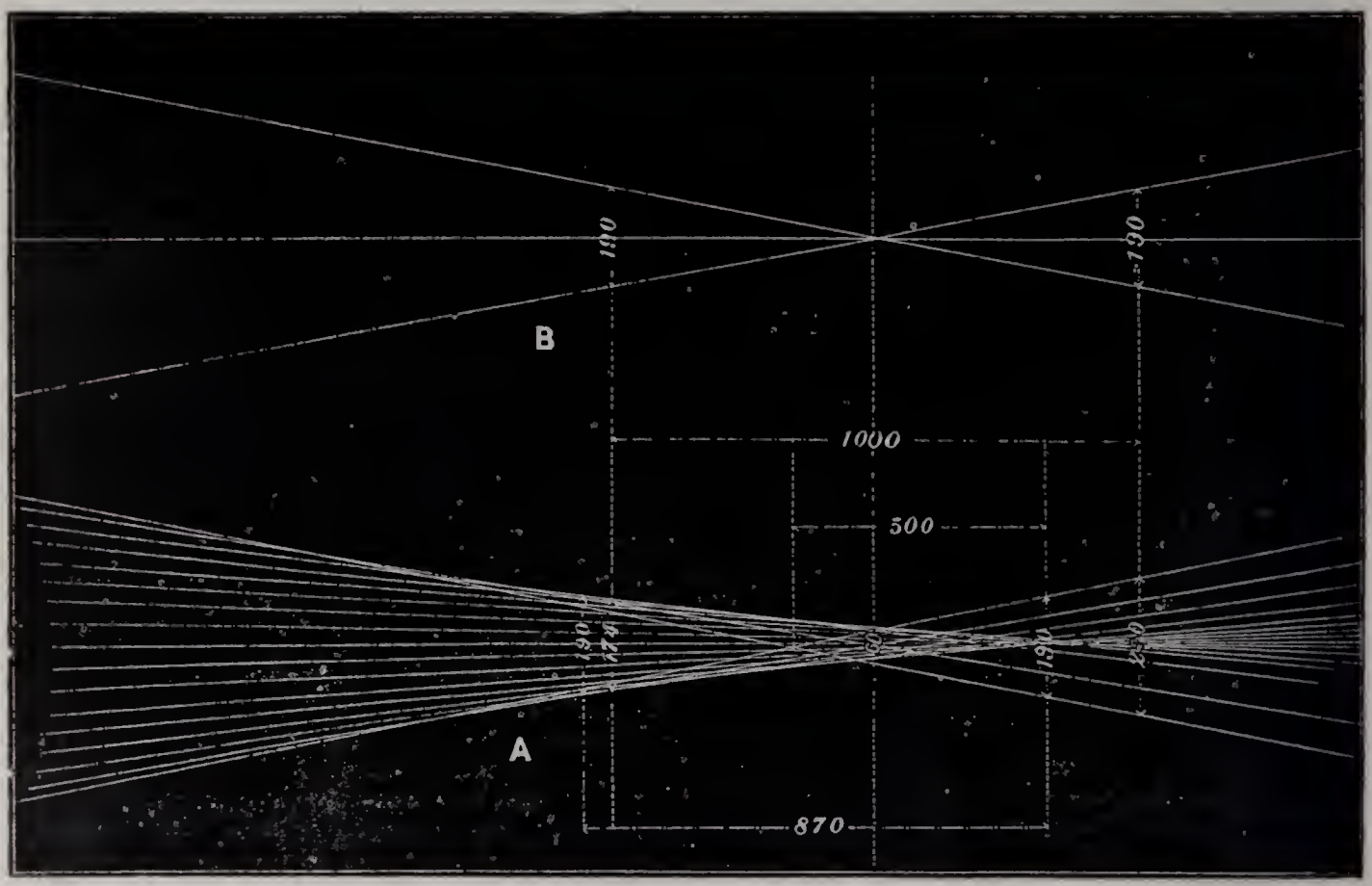
* The full title of this article, as sent to us by Mr. Burton, is "Dallmeyer on Limitations in the Treatment of Subjects by Focus, and on one or two other Subjects."—Ed.

I consider a double apology due for touching on this subject again, one to your readers for once more bringing up a matter that has, as most will, I fear, consider, been discussed *ad nauseum* already, and another to Mr. Dallmeyer for venturing to differ from so great an authority as himself on a purely optical subject. It is with the utmost diffidence that I do so because, for one thing, optics are a very slippery subject, and one is liable to stumble, even after all care; for another, I must confess that I sometimes have difficulty in quite following Mr. Dallmeyer's meaning. This I have not the smallest doubt is my own fault; but if I have misunderstood Mr. Dallmeyer in the particular point that I am now taking up, I am sure that I will be held excused, for I think there must be many others who have misunderstood him as well as me.

To come to the point, Mr. Dallmeyer has several times stated that, in the case of a lens with diffusion of focus introduced in the form of positive spherical aberration, the effect, if a middle distance object is focussed, is that the falling off of definition, although greater for a near object than in the case of a thoroughly corrected lens, is less for the distance, and that, the important object being to reduce the contrast between the definition of the object focussed for and the distance, diffusion of focus is a useful thing.

Now I state that the facts are *the direct opposite of this*. Positive spherical aberration favours the *nearer* objects at the expense of the distance. I think that I can prove this, and that, consequently, all Mr. Dallmeyer's arguments in a recent controversy with Mr. W. E. Debenham, and also those at the recent Camera Club Conference, fall to the ground.

I must ask for leave to have reproduced an illustration that has done service many times, namely, that of Mr. Thomas Grubb, used by him in combating the claims of the late Mr. Dallmeyer in the matter of diffusion of focus.



I would ask a close inspection of this cut. The upper diagram represents the condensation of the rays of light from a point after passing through a lens without spherical aberration; the lower, the condensation of similar rays after passing through a lens having diffusion in the form of positive spherical aberration.

In the former case the rays come to a focus at a point; in the latter case they do not, but come to a series of foci at different distances from the lens, forming, however, a "quasi-focus," which is generally assumed to be at that distance from the lens where the bundle of rays is of the smallest diameter.

It will be seen that, in the case of the upper diagram, the diameters of the cones of light, or "bundles of rays," are given at equal distances in front of and behind the point of focus, the diameters being equal, and, in each case, 190 units.

In the case of the other diagram, where there is diffusion represented, the diameters are again given at equal distances behind and in front of the quasi-focus, and that at that same distance as in the case of the lens without spherical aberration. In this case it will be found that the bundles of rays are *not* of equal diameter, but that, whereas that farther from the lens is represented by 280, which is much more than 190, the other is represented by 174, which is somewhat less than 190, so that in this case there is a positive gain in the size of the circle of confusion representing a point.

So far the argument is sound, but after this it seems to me that it woefully ceases to be so. Mr. Dallmeyer goes

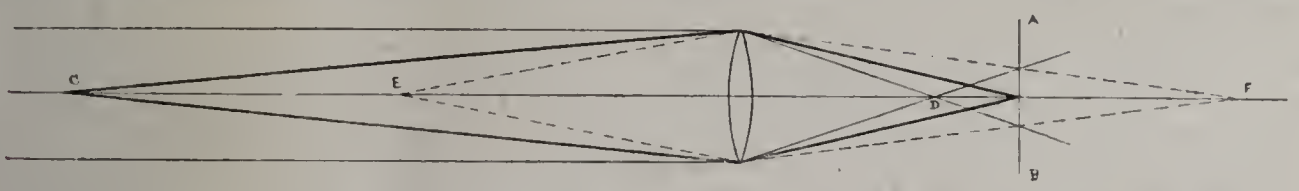
on to speak of the bundle of rays nearer the lens than the quasi-focus as representing planes "beyond the point focussed upon." He refers to this several times, about the most distinct statement appearing in a letter to the Photographic News of April 27th, 1888. I quote from the letter:—"My claims for the advantages on the side of the lens in question cannot fairly be refuted by Mr. Debenham or any other photographer; and they are founded on the ground that it is chiefly and almost entirely the better definition of planes beyond the point focussed upon that we are aiming at, neglecting as far as possible the question of foreground, where the disadvantageous conditions would appear."

Mr. Dallmeyer assumes that the bundle of rays nearer the lens than the plane of focus represents the distance, those farther from the plane of focus the foreground. Now *the exact reverse is the truth.* If a middle distance object be focussed for, the distance is represented by a part of the bundle of rays *farther* from the lens than the point or points where they crossed; an object in the foreground is represented by a portion of the bundle *nearer* than the point or points where they would cross, were they to pass through the plate or focussing glass.

It is true that, in focussing, we move the lens nearer to the ground glass for a distant than for a near object, but this has nothing to do with the position at which the bundles of rays are cut by the plane of the ground glass when this is not in a fixed position. I think this will be made clear by a diagram that I have made.

In this sketch A B is intended to represent the plane of the focussing glass. C is supposed to be the point focussed for, and the light, represented by two thick lines, is shown as meeting at a point in the plane of the ground glass.

The thin, full lines (parallel till they reach the lens) are supposed to represent light from a distant object. It will be seen that the light rays cross *nearer* the lens than the plane of the ground glass, namely, at D. The dotted lines are supposed to represent light from a foreground



object at E. It will be seen that they cross *farther* from the lens than the ground glass, namely, at F. I have not attempted to show actual spherical aberration in this illustration, as the result would be too confusing, but a moment's reference to the diagram of Grubb given above along with my own will show that *were* there spherical aberration, the distant point would be represented by a much larger disc of confusion than the foreground point.

I think it will be conceded that the whole of the recent ingenious demonstration given by Mr. Dallmeyer at the Camera Club goes to show that the result of introducing diffusion in the form of positive spherical aberration is to improve the definition of the foreground a very little at the cost of the distance, which is thereby thrown into much worse definition than with a completely corrected lens. This may be partly compensated for in practice by the fact that we do not focus when there is positive spherical aberration for that part of the bundle of rays that is of least diameter, but for a plane somewhat nearer the lens than this, as I have already described in the Photographic News.

After all this, I do not by any means wish to argue that diffusion of focus is of no use. I have, on the contrary, always held that it is of great practical use, but only in reducing the *contrast* of definition. If Mr. Dallmeyer had confined himself to claiming this he would have been on safe ground, but he has tried to prove too much. Another thing in this. Although the effect of positive spherical aberration certainly is to improve the definition of the foreground at the cost of the distance, I notice, in examining the illustration that accompanies Mr. Dallmeyer's paper read before the Camera Club, that there is no appreciable difference between the two until much more spherical aberration is introduced than would be tolerated in practice.

Farther than this, I do not at all know that I agree with the dictum of Mr. Dallmeyer in which he lays it down that it is always most desirable to reduce the amount of lack of definition of the *distance* without reference to the foreground. I think there are many cases in which the exact reverse is the case.

A Curious Legal Case.—The Supreme Court at St. Paul, Minnesota, handed down a decision on July 1st., in the case of Ida Moore, of Minneapolis, against Photographer Rugg. Rugg sold a copy of Mrs. Moore's picture, which was put on exhibition in improper places, much to the discredit of the lady, and she brought suit for damages. The Supreme Court holds that it is a case in which there is ground for the recovery of damages; that the photographer has no right to dispose of pictures which are the sole property of the sitter. The decision is an important one. Similar cases have arisen once or twice previously in other parts of the country.—*American Journal of Photography.*

Toning Bath for Gelatino-Chloride Paper.—Herr Steiglitz recommends the following toning bath for this paper:—

Chloride of gold	0·25 gramme
Nitrate of uranium	0·25 ,,
Bicarbonate of soda	5· grammes
Distilled water	300 c.c.

This bath should be used immediately, as it does not keep. The prints should be printed deeply, and washed at least in six changes of water before printing. Fix with:—

Hyposulphite of soda	1 part
Water	5 parts
Ammonia	a few drops

The prints are toned in a few minutes.

To obtain a reversed negative, Mr. Kronenberg makes use of the Eastman negative transfer paper. He places in the frame a perfectly clean plate, having the thickness of one millimetre; he applies the negative paper, then a second plate, so as to obtain perfect planitude. After exposure and development, the paper is placed for two minutes in a bath of 500 cubic centimetres of distilled water and one cubic centimetre of acetic acid, then in the hyposulphite; wash for ten minutes, then transfer the print to a glass plate coated with gum-arabic dissolved in benzine. To obtain adherence use the squeegee, then place the whole in tepid water, and at the end of three minutes remove the paper. If necessary strengthen in the ordinary manner.—*Deutsche Photographen Zeitung.*

THE RECENT CITY PHOTOGRAPHIC EXHIBITION.

THE following is the report of the Executive Committee of the Photographic Section of the London Chamber of Commerce in relation to the recent Photographic Exhibition at the Drapers' Hall, London.

The executive committee appointed by the Section to organise the Exhibition promptly commenced its duties by issuing a circular to the trade, and, efficiently assisted by the secretary of the Chamber, carried it through with a fair measure of success in the manner you have witnessed.

There were seventy exhibitors, eleven hailing from the provinces, and fifty-nine representing the metropolis. A large and interesting display of apparatus was made, and a representative collection of photographs and processes of printing gathered together at Drapers' Hall, every available foot of space in the noble suite of rooms lent to us being occupied. The soirée was numerously and influentially attended, and in its arrangements a success. The visitors to the Exhibition were mostly city men and their friends, the numbers averaging about 1,200 a day for the ten days it was open. Many of the visitors took quite a practical interest in the apparatus, and showed a lively appreciation of the photographs displayed. Some amount of business issued directly from the Exhibition your committee knows, and, considered commercially, one may safely say that the trades represented enjoyed a peculiarly efficacious advertisement at a moderate cost.

The statement of receipts and expenditure now submitted bears witness to a small balance in hand. The treasurer of your committee availed himself of the convenience of passing receipts and expenses direct through the Chamber, which received £340 6s. 6d., and paid away £332 18s. 7d., handing to him a balance of £7 7s. 11d. This balance became increased to £8 8s. 5d., from which £5 16s. 0d. was refunded to exhibitors who had paid for more space than the committee were able to allot, leaving a nett surplus of £2 12s. 5d., the disposal of which you will determine. Of the total receipts, the sum of £18 17s. 6d. was contributed by the Chamber, which levied a small tax on its members outside the Photographic Section in the shape of a charge on tickets for the soirée. On the whole conduct of the Exhibition your committee has had the benefit of the knowledge, experience, and influence of the Chamber.

(Signed) W. S. BIRD, *Chairman Executive Com.*
THOS. P. WATSON,
FRANK BISHOP.

YELLOW STAINS.—Every photographer is, no doubt, to his own sorrow, familiar with a yellow stain in the negative, caused by taking the plate from the fixing bath before it is thoroughly fixed. Mr. Belitski, the well-known photo-chemist, made some experiments recently to remove this stain, and succeeded very well. A slight stain can often be removed by placing the negative in the following solution: 50 parts alum, 1,000 parts water, 10 parts bichromate of potassium, 20 parts muriatic acid. After several minutes the negative turns yellow all through. It is washed now very thoroughly, exposed to sunlight for several minutes, and developed or blackened with the ordinary iron developer. When the stain is very intense this remedy will not prove to be of any avail, and only by leaving it for twenty-four hours in the Lainer acid fixing bath (so often described in all journals recently) he succeeded in removing the stain, and saving valuable negatives.—*Deutsche Photographen Zeitung.*

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

PHOTOGRAPHIC NOMENCLATURE—NEGLECT OF THE TOMB AND WORK OF DAGUERRE AT CORMEIL-EN-PARISIS—NEW PROPERTY OF GELATINE—ACETATE OF AMYL LAMP—SENSITO-COLORIMETRY FOR ORTHOCHROMATIC PHOTOGRAPHY—LANTERN SLIDES PROJECTED IN STEREOSCOPIC RELIEF—LANTERN CARRIER BY M. DONNADIEU—FREEDOM OF PHOTOGRAPHY IN THE STREETS OF PARIS—LITERATURE.

Photographic Nomenclature.—In connection with the presentation of the latest work of the French Photographic Society, regrets have been expressed that the terms adopted by the International Congress of 1889 have not been employed. We look upon these regrets as premature. The work of the Paris Congress is destined to be revised by another Congress, which will take place probably in Brussels in 1891. It is very probable that many of the decisions of the preparatory Congress of Paris will be reversed, and it is desirable to await a fuller authorisation before hastening to adopt expressions on which a better understanding may be arrived at. For our own part, we opposed in the Congress the use of the expression *phototype* as the designation of the photographic negative, and we hope that the necessity for the employment of another word will be recognised, since the word *phototypie* has to serve as designating the application of photography to typography. The Congress of Paris, although held during the Universal Exhibition, did not include such a number of adherents that its work can be considered as definitive; therefore why should it be desired at once to impose the putting in practice of solutions essentially provisional?

Neglect of the Tomb and Work of Daguerre.—In spite of the glory which is attached to the name of Daguerre, his tomb at Cormeil-en-Parisis appears to be absolutely neglected. The curé of this commune has informed the Photographic Society of the fact. He adds that the painting executed by Daguerre in the choir of the church requires considerable restoration. The cost of both reparations would amount to between three thousand and four thousand francs. It would seem not to require a great effort for the Society and other photographic groups to cause these restorations to be promptly undertaken. It is a duty that should be attended to at once, and we hope that the curé of Cormeil will not in vain have addressed himself to our photographic association, which is rich, and equal of itself to the accomplishment of this task.

New Property of Gelatine.—Messrs. Louis and Auguste Lumière, of Lyons, announce the property of chloride of barium of dissolving gelatine. Mr. Bardy says in this connection that chlorides of magnesium and of zinc possess the same property.

Acetate of Amyl Lamp.—General Sebért has presented an acetate of amyl lamp made according to the specifications laid down by the Congress. A screen carrier has been added in such manner as to cut the flame at the desired height. The model is very well made, but the price would be too high for it to come into practical use. Instruments of this character cannot be in the hands of every one, unless the cost is such as to render them accessible to all. Until that time a simple candle has much greater chance of being generally adopted than lamps, however perfect, the cost of which is from fifty to sixty

frames. Apparatus of other kinds, still based upon the decisions of the Congress, are in course of construction. We see no objection to this. It will permit that they may be put to the test of trial before the meeting of the new Congress, in which there may be questions of introducing improvements if certain defects are recognised. Only it is well to look upon all this for the present as provisional, since it may be reversed at the Brussels Congress.

Sensito-Colorimetry for Orthochromatic Photography.—Mr. Stebbing desired us to confide to him the execution of the sensito-colorimeter which we presented at a preceding meeting of the Society. He has copied the model and presented several examples of it. It consists, as is known, of a polychromatic screen bearing the principal colours of the spectrum. These colours are deep and light blue, deep and light green, deep and light yellow, and finally, deep and light red. Behind the transverse bands formed by the colours, there are four bands cutting across them formed of yellow screens of different depths suitable for orthochromatic photography. The instrument permits us to ascertain the behaviour of orthochromatic plates to rays of various colours, with the aid of yellow screens of various degrees of intensity, as well as without the addition of such screens. The accompanying diagram will explain the arrangement better than any description. The indications B_1 b_1 signify deep blue with the yellow screen No. 1, and light blue with the same screen. In the same way, R_3 and r_3 signify deep red with screen No. 3, and light red also with the No. 3 screen. The letters *B*, *V*, &c., without numbers represent deep blue, deep green, &c., without a yellow screen, and so on. We believe that this method of uniform control will allow comparable observations on orthochromatic sensitiveness to be made by all.

SENSITOCOLORIMÈTRE
· LÉON VIDAL ·

COULEURS	ÉCRANS N° 4	N° 3	N° 2	N° 1	SANS ÉCRAN
Bleu foncé	B_4	B_3	B_2	B_1	B
Bleu clair	b_4	b_3	b_2	b_1	b
Vert foncé	V_4	V_3	V_2	V_1	V
Vert clair	V_4	V_3	V_2	V_1	V
Jaune foncé	J_4	J_3	J_2	J_1	J
Jaune clair	j_4	j_3	j_2	j_1	j
Rouge foncé	R_4	R_3	R_2	R_1	R
Rouge clair	r_4	r_3	r_2	r_1	r

Lantern Slides Projected with Stereoscopic Relief.—M. Molteni held a meeting showing the application of a method of obtaining stereoscopic relief in pictures projected by the lantern. Two lanterns are placed side by side, furnished the one with a red and the other with a green glass (complementary colours). On the screen there are thus found two images, one red and one green, and they are superposed as exactly as possible. The spectators are also supplied with eye-glasses, the glass for one eye being red, and for the other green. The image seen on the screen is monochromatised, and the relief is very apparent if the superposition is exact. The experiment was truly of great interest.

Lantern Carrier.—M. Donnadieu, Professor of the Faculty of Science at Lyons, has designed a new lantern carrier, of which the following is a description, for the purpose of overcoming the difficulties that occur in centreing and properly placing an image on the screen when one has to work in a dim light.

The front portion of the plate carrier is made of a piece of wood with an aperture of eight centimetres square, bordered by a double rebate, the inner one chamfered, so as not to throw any shade upon the opening itself. It is closed by a shutter turning on pivots or hinges worked at will by a button. Behind the wood which forms the bottom of the carrier is placed a strong glass. The frame is pierced on each of its four sides by a slit, in which is a sliding piece in the form of a T. A pinching-screw placed above each slide fixes it in any required position, and the slide, being narrower than the slit, may be placed obliquely, and, being scarcely a millimetre thick, does not project beyond the thickness of any plate that may be used. In the frame is fitted a movable guide, which is cut out in the centre to receive the plate. This opening must, therefore, be of the size of the plate, or may take carriers themselves fitting the plate. A spring pressure board with opening, covered on the side next the negative with cloth, serves to keep the plate flat against the stout glass of the carrier. A ground glass, marked with perpendicular and diagonal lines, is placed in one of the rebates. The negative is then adjusted in a full light to the desired position against the lines, and the ground glass being removed, the carrier may be taken into the dark room and placed in the lantern by feeling only.

Photography in the Streets of Paris.—We are now at liberty to photograph in the streets of Paris without any preliminary authorisation from the Prefecture of Police. At the present time photography expands more and more every day. The measure which has just been taken was an inevitable one, and it is well that the Prefecture has at last yielded to the many representations that have been addressed to it on this subject by the general syndicate of photography.

Photographic Literature.—M. Mathet, chemist, has just published a work on photographic chemistry, which is at the same time a sort of general treatise on photography. The new work by Col. Waterhouse, on the photographic reproduction of designs, entitled "Practical Notes on the Preparation of Drawings for Photographic Reproduction," is of very important character. It is a classic for schools of design and photography. We cannot too highly recommend it to the reader.

Coating Celluloid Films.—A point of interest to users of celluloid films is brought to light in one of our exchanges, to the effect that the various makers of these films coat the celluloid on different sides, some makers preferring the matt surface as a support for the sensitive emulsion, and others coating on the polished side. Of course it behoves the user to familiarise himself with the method followed in the films he uses, as otherwise it will be an easy matter to place it in the holder "wrong side out," which would be most unfortunate, though from just such a blunder as this our exchange procured some negatives through the films which had the quality of being unusually free from halation.—*Anthony's Bulletin.*

PHOTOGRAPHY IN COPENHAGEN.

Two numbers have reached us, by the courtesy of the editor, of the *Beretninger fra Dansk Fotografisk Forening*, or news from the Danish Photographic Association, a journal which is published by the Association, and is now in its twelfth year of existence.

The number for April contains among its leading articles a notice of the transactions of the Association at a meeting held on the 31st March, contributed by the able editor, J. Petersen; also an article by Immanuel Mohr on albumen paper and its sensitising, and an article on a festival held on the 10th and 11th of April by the Association in aid of its photographic work.

The number for May contains a notice of a meeting on the 28th April, at which the President gave as the subject for discussion "What is the reason some pictures become yellow with age, and others do not?" The speaker advised the members to collect old pictures which might bear upon the subject of the question. It would, he said, be interesting to form a small exhibition of such pictures on albumen paper, salted paper, and so forth.

The Vice-President gave it as his opinion that the cause of this yellowing lay chiefly in the paper employed; the older papers were better, he opined, than those at present used.

Hr. Hartmann, in some observations about the darkening of white colours used in retouching, said that it was advisable to be careful to use good opaque colours, which were not liable to change. Hr. Cand. Pharm. Schleisner thereupon said that a good test for the stability of the white colour was to pour upon it a few drops of sulphide of ammonium; if the colour under this experiment did not change to black, it would well resist the influence of the atmosphere. "Permanent" white was permanent, but not so good for covering. Lead colours were good for covering, but not permanent.

The President then proposed a summer meeting, and Hr. P. Fristup, speaking for himself and Hr. Schon, said they would be glad to do all that lay in their power, but advised a preliminary meeting at the earliest opportunity in some spot where there was a garden in which one might promenade, and also a bowling green, with other forms of amusement. The larger summer meeting might, he thought, be best arranged in such a minor assembly. The Vice-President promised that the proposition should be laid before the general committee.

The next article in the May number by L. Belitski is concerned with an exact comparison of different photographic objectives. Immanuel Mohr continues his article on albumen paper and its sensitising. An interesting treatise on carbon printing is contributed by O. Volkmer, vice-director of the royal press.

Under the head of literature is announced the appearance of a hand-book of photography, with numerous illustrations, edited by Albin Roosval. This work was commenced by the late lamented Swede, Adolf Dahlström, and is continued by the editor of the *Swedish Photographic Journal*. One great feature in this work is that only so much of the technique of the photographic art is communicated as is necessary for the practical artist, and it avoids long, scientific explanations. The book might, in the opinion of the *Beretninger*, take a leading place among its congeners in Scandinavia. Though written in Swedish, no Norseman or Dane would experience much difficulty in its perusal. What little difficulty there may be could be easily helped by the addition at the end of a small Swedish, Danish, and Norwegian glossary, including such Swedish words as might seem stumbling-blocks to readers from Norway or Denmark. The cost of such an addition would be trifling, and the value of the work thereby greatly increased.

The number concludes with a notice of the death of Hr. E. Rye, who died on the 15th April, in his seventieth year. He was one of the veterans of the photographic profession. Like many others of the pioneers of the photographic art in Denmark, Hr. Rye lived a very busy life. When quite a boy he began his career as assistant to an apothecary, but very soon left that occupation, which suited him not a jot. After being a tutor for a few years he took to the wine business, and later on bought a hotel in Grenaa; but the business of playing the host at Grenaa was not of the kind to satisfy this energetic young man.

At that time photography was a newly-discovered art in Denmark. Rye saw, with the eye of the prophet, the great future in store for it, and, thinking that his pharmaceutical experience and knowledge might serve him in good stead, sold his hotel, and devoted himself to photography. His prentice hand was tried in Aachen, in the establishment of the well-known Wothly. Upon his return home, he busied himself for a whole winter with photographing the most noteworthy objects in Thorvaldsen's Museum, and gave instruction at odd intervals in the art of photographing on glass. Then he thought of building himself a studio, but met with obstacles set in his way by the fire brigade, and, since he feared there were then already too many photographers in Copenhagen, he gave up his idea, and travelled to Finland. After a year's furlough, he returned home and set up a studio in Vegle, and then another in Aarhus, and lastly, took Petersen's studio in Odense. Together with Schröder he practised phototypy. An attempt to make this new invention a success in America met with very poor encouragement.

After other devices equally vain to make his fortune in the far west, Rye at last determined, in 1872, to settle in Copenhagen. And now, indeed, it seemed as if fortune was disposed to favour him. His studio in Ostergade became very soon a celebrated resort, and for some years everything went very well. Then, in the height of his prosperity, came sickness, at first like a little cloud no bigger than a man's hand, but afterwards by degrees extending over him more and more, till at last he fell into the state of a confirmed invalid, and his business into consequent decay. Broken in body and in heart, he left his studio, left his photographic labours, left, finally, his life. His earnings, for some reason or other, were not sufficient to ensure him comfort in his old age.

He was a member of the Danish Photographic Association, and for several years one of the most assiduous and constant attendants at its meetings. "It was only when sickness marked him for her own," says the *Beretninger*, "that we missed him from our midst." The Association sent a wreath to be laid upon his coffin, and many members mourning followed him to his grave.

THE NEWCASTLE-ON-TYNE PHOTOGRAPHIC ASSOCIATION.—Mr. E. G. Lee, honorary secretary to this Association, writes that it has arranged the following outdoor meetings:—Thursday, 14th August, "Gilsland and Naworth." Leader—M. Auty, Front Street, Tynemouth. Thursday, 18th September, (district not yet fixed). Leader—J. P. Gibson, Fore Street, Hexham.

PRINTING OPERATIONS.

BY ELLERSLIE WALLACE.

The drying of a photographic print after the final washings have been completed is a simple enough matter, yet it is possible for the most exasperating failures to occur at this stage of the process; the disappointment experienced being all the more keen because the work is, in a certain sense, finished.

Those unacquainted with photographic neatness might easily imagine that all that was necessary was to take the print out of the water, and lay it aside in any convenient place to dry. They would soon find out, however, that if the substance with which the wet print came into contact were capable of communicating any impurity, the print would be sure to show it in the form of stains. For instance, suppose that the prints were hung over wooden poles, or laid on wooden shelves, while still wet, there would hardly be a possibility of escape from stains. This would be true in the case either of silver prints of any kind, bromides, or blue prints.

Silver prints on plain paper and blue prints are more manageable in drying than the other forms, which are made on papers prepared with a contractile substance like gelatine or albumen. Supposing that the wooden poles or shelves before spoken of were covered with clean white linen or blotting paper, all those forms of prints having a plain surface might safely be dried there, but an albumen paper print would not do so well. If laid out flat on the shelf it would contract unequally, and be so crinkled and shrunken that there would be serious difficulty in trimming. Drying over the pole would be preferable, but the albumenised surface would be put on the stretch unequally, so that in the case of a highly glazed surface there would be fissures and cracks very detrimental to the finished result.

The best method of drying prints of all descriptions, and a very convenient and inexpensive one also, is the following: Provide a number of spring clothes-pins, a few yards of ordinary brass wire, and a couple of good-sized screw-eyes. Having selected a suitable place in the work-room where the prints will not be disturbed, screw in one of the screw-eyes to the wood of the window or door jamb at the height of the shoulder; pass one end of the brass wire into the eye and secure it, then string the clothes-pins on to the wire, and secure its other end by means of the other screw-eye at a convenient point across the room. Having brought the prints from the washing tank in an ordinary deep pan, select those of similar sizes, bring them together neatly, back to back, while in the water, then take them out and suspend the pair from one or more of the clothes-pins, according to the size of the prints. If they are very large, it may require three of the clothes-pins to fully support them, and avoid risk of the wet mass tearing by its own weight: while on the other hand, small sizes, such as 5 by 4 inches, may be held by a single pin. When the paper is very glossy, and the weather dry, the larger sizes may require to be pinched together at the bottom corners by an additional couple of clothes-pins, which will prevent the prints from separating until thoroughly dry.

Prints dried in the manner described will be quite flat, and free from stains of any kind. We need hardly add that the clothes-pins should be new and clean, and kept for this purpose only. If the prints are hung up to dry in the evening, they will be ready for trimming in the morning, when the end of the wire may be released, and the whole turned aside out of the way until the next occasion for use. If the wash-water is muddy, as is often the case, the deep pan in which the prints are transferred to the drying room may be filled with clean filtered water, so that the collected mud in the paper may be soaked out before drying.

The warm weather we are now passing through reminds us of a few matters which have greatly eased our own labours in the printing room, and, simple as they are, we will mention them.

It sometimes happens that there is trouble in securing pure whites in prints on albumen paper, an universal yellow stain covering everything. The best remedy for this is the use of alum in the printing bath, as originally suggested by the late Mr. Anthony, of New York. Care also must be taken that the paper is quite dry before being fumed. Operators are too apt to forget that, as the thermometer rises, so does the amount of watery vapour in the air increase, and that sheets of paper will often dry more quickly on a bright day in winter than on many hot days in summer. The way the paper feels to the hand is the best guide, and some little attention is required to be able to tell accurately.

The question whether the strength of the silver bath should be reduced or not during warm weather is open to some discussion. If the paper be of first-class quality, and the bath contain alum, as before alluded to, it would be possible to continue making good prints having pure whites with the bath at full strength, by which we mean fifty to seventy grains to the ounce. There is no question of the fact that the sensitiveness of the prepared paper increases when floated on a strong bath, and that the compound which is then formed between the albumen and the silver is more prone to decomposition. It will occasionally happen, if the prints come out yellow, metallic-looking, and covered with minute black specks, that weakening the silver bath down to the strength of forty-five or even forty grains will cure the trouble. A strength of forty grains, however, we should consider a low one, and only to be resorted to for unusually hot weather or for particular kinds of paper, such as very thin and delicate Rives.

The paper should not be left in the fuming-box for too long a time in hot weather. If things are properly arranged for the purpose, ten to twelve minutes ought to suffice for thorough fuming. It is important, of course, that good strong ammonia be employed, and care should be taken that the glass stopper be well secured in the bottle. In a hot printing room the stoppers of ammonia bottles are frequently blown out by the vapour and fall on the floor, leaving the contents of the bottle to lose strength rapidly.—*American Journal of Photography.*

It is hardly to be wondered at that Japan seems destined to take such a prominent place in photography, when we think that she has always worshipped the Sun-Goddess, and that its representative, the burnished mirror of bronze, is still such an important household article, and plays such a prominent part as it does in the social economy of the country.

The Late Paris Exhibition.—The New York *Lithographic Art Journal* says that the engraving of the diploma for those who were awarded prizes at the last year's Paris Exhibition is now finished, and has by this time gone to press. Before the diploma will be issued at least four months more will have elapsed, and whoever gets it then may obtain the silver or gold medal awarded him—by ordering somebody to make it for him.

Notes.

Mr. Adams has exhibited to us his "Ideal" detective camera, which has exteriorly no projecting parts, and measures $8\frac{5}{8} \times 4\frac{3}{4} \times 8$ inches. It is fitted with a Newman's shutter of modified form, and Newman's pneumatic shutter has, by the test of general experience, proved to be a good one for the regulation of the duration of short exposures amounting to but small fractions of a second. The shutter works in the diaphragm slot, and requires no setting; there is also an arrangement for what are called "time" exposures. The plates are packed in sheaths, and each plate, after exposure, is drawn downwards by means of a clutch governed by a rod which is handled from outside the box; springs then push the next plate in the batch into position for exposure, and so on in succession.

Last week we drew attention to the advantage to the tourist photographer of the relatively small amount of wind in some parts of Switzerland, but now wish to speak of various meteorological phenomena which do not promote photographic work. Among the Swiss mountains there are such things as wind avalanches; in a mild form they amount but to strong gusts, which come upon the wayfarer at unexpected moments, when at a little distance all is calm. These sudden "windfalls" are frequent and dangerous enough to have stopped the use of small sailing boats on some of the Swiss lakes; in the past such boats have sometimes been upset by the unexpected squalls, and lives have been lost. On rare occasions wind avalanches have been directly dangerous to pedestrians. In the *Alpine Journal* of June, 1864, is a paper by Mr. Gosset, describing a fatal accident on the Haut-de-Cry in February of that year, to which paper Mr. F. M. Millard, of Maidstone, draws attention in last week's *Nature*. A body of air rendered colder and heavier than the surrounding air by the snow and ice, suddenly descended upon a mountaineering party of six, with disastrous results. Mr. Gosset says:—

"Bennen advanced; he had made but a few steps when we heard a deep, cutting sound. The snow-field split in two about fourteen or fifteen feet above us. The cleft was at first quite narrow—not more than an inch broad. An awful silence ensued . . . . broken by Bennen's voice: 'Wir sind alle verloren.' . . . They were his last words. I drove my alpenstock into the snow, and brought the weight of my body to bear on it. . . . I turned my head to see whether Bennen had done the same thing. To my astonishment, I saw him turn round, face the valley, and stretch out both arms. The ground on which we stood began to move slowly, and I felt the utter uselessness of any alpenstock. I soon sank up to my shoulders, and began descending backwards. . . . . The speed of the avalanche increased rapidly, and before long I was covered up with snow. I was suffocating when I suddenly came to the surface again. I was on a wave of the avalanche, and saw it before me as I was carried down. . . . The head alone was preceded by a thick cloud of snow-dust; the rest of the avalanche was clear. Around me I heard the horrid hissing of the snow, and far before me the thundering of the foremost part of the avalanche. . . . . At last I noticed that I was moving slower; then I saw the pieces of snow in front of me stop at some yards' distance; then the snow straight before me stopped. . . . . I felt that I also had stopped, ... but the snow behind me was still in motion; its pressure on my body was so strong that I thought I should be crushed to death. . . . . The avalanche may have taken a minute to descend; I can give no correct estimation on this point."

On one occasion, from the side of a valley we were photographing the distant range of the St. Gothard and intervening scenery, upon a hot, sunshiny day when there was no trace of wind except upon the hill-side a few hundred yards in advance of the camera; a narrow band of wind was there pouring down, keeping the trees in its path in incessant motion, while all elsewhere was still. Upon walking up to the spot to discover the cause of the commotion, a small ravine in the side of the main valley was found, down which air was pouring which had been cooled and rendered heavier than the surrounding air in the shade of great pine forests which crowned the heights; the cooled air was being drained off by a natural channel.

Photographic meteorological records, on the same system as at Kew, are made at Hong Kong in the Observatory there belonging to the British Government. The instruments at Hong Kong—properly called "Heung Keung"—to which meteorological recording apparatus is attached are the barograph and thermograph; there is no magnetograph on the premises. Bromide paper is used, as at home, but there is more difficulty in keeping it in the hot climate; some samples after a time get spotty. The Observatory was opened for work January 1st, 1884, at which time the waxed paper process was used, and this was superseded by bromide paper four or five years ago. The difficulties in working the old waxed paper process at Hong Kong were much greater than in working it at Kew; some kind of chemical change seemed to take place while the paper was on the cylinder, owing, probably, to the great heat. It developed irregularly, and seemed to lose sensitiveness in a manner it would not have done in colder regions. In Hong Kong there are about twenty photographers, and nearly all of them are Chinese. The chief professional photographer in Hong Kong, or the one who is generally recognised as such by the public, is A Fong. The great bulk of the population of China objects to photographic portraiture; an average Chinaman thinks that a photograph "takes away a portion of the soul of the sitter." In and about the treaty ports open to western barbarians, however, this superstition of the native population is breaking down.

We have lately received a letter from a photographic friend at Durban, Natal, who went out there about twelve months ago to try his fortune. He is just about to commence a photographic tour up country, and he says that "although the scenery is beautiful, there are few bits that make good pictures." This is possibly because of its vastness, and represents a source of disappointment to many a tourist who has taken a camera to other lands—to Norway, for instance. He further tells us that the country is in "an awfully depressed state, so if you know of anyone coming here, tell him

not to do so." We print this warning, as it represents a little piece of disinterested advice which may prove useful.

When Solomon wrote that "there is nothing new under the sun," he, of course, had no thought of photographic apparatus in his mind, because, as the old song has it, "it was not then invented;" but for all that the oft-quoted line is peculiarly applicable to so-called photographic novelties. The latest detective camera, for instance, takes the form of an opera glass, and the idea has been patented. But such a camera was constructed and shown to us ten years ago, and we have in our possession several photographs taken with it. We have often wondered why the notion was not revived, for it is certainly a good one.

We all know that, as a general rule, the simplest method of achieving a certain result is the best. One of the American humorists puts the matter in a quaint way by describing a prisoner confined in a dungeon who in vain tries to break the bars of his window, and to remove the stones from the walls, until a happy thought struck him; "he opened the door and walked out." Some such simplification has become desirable in chemical nomenclature, and the man who will suggest a way of "opening the door" to such a consummation will deserve the thanks of his fellows—and, we may say, especially fellows of the Chemical Society. Turning over the pages of the last "proceedings" of that highly useful body of workers, we come upon several terms which may be highly descriptive, but are certainly jaw-breaking. We will only quote one, and here it is: oximidolactone of xylylphenylacetoximeorthocarboxylic acid. We hasten to offer a prize to the first among our readers who will go to the nearest chemist's and ask for a pennor'th of it.

But seriously, cannot something be done in the direction indicated? Chemistry has always prided itself on the fact that its symbols convey in a simple manner a definite meaning, and not only give the composition of a substance, but the proportions in which its constituents are present. In this way it is far ahead of its sister science, botany, where the names of Smith, Brown, & Co.—that well-known quartette—are dragged in with other common surnames and turned into ridiculous Latin. The problem is a hard one, but it ought to be more easy of solution than some of the nuts chemists have had to crack.

Why does not the Government have the Hessian fly—when it is caught—photographed? A Government paper has been issued, in which illustrations of the usual character are given; but we are afraid that, to the average bucolic mind, these illustrations will not convey a vivid idea of the pest. A photograph slightly enlarged, on the other hand, would not only picture the insect in a recognisable form, but would bring home the truth, that there is such a thing as the Hessian fly; because, if it did not exist, how could it be photographed?

The late Sir Richard Wallace has to be included amongst those strong-minded, not to say eccentric, persons who object to sitting for their photographs, and it is said that it is doubtful if a photograph of this well-known patron of art is in existence. We are afraid that the old days of photography have much to answer for. The length of the sittings frightened a great number of people, and led to the stereotyped remark, "I always come out badly in a photograph." This kind of thing has, of course, long passed away, but the dislike, or prejudice, or whatever the feeling may be called, still remains among sitters who were photographed thirty years or so ago.

We do not know whether it is a practice of photographers who are fortunate enough to number among their *clientèle* a goodly proportion of celebrities, to keep an album in which their sitters can record their sentiments, but it would not be a bad idea. We believe that during Emerson's last visit to England he sat to Elliott and Fry, and wrote this in their album:—

"The man who has a thousand friends
Has not a friend to spare,
But he who has one enemy
Will meet him everywhere."

A photographic outfit is an indispensable adjunct to the "caravan" method of taking a holiday. One of these holiday homes upon wheels has lately been described by a society journal. Among other information, we are told of a photographic apparatus and a small photographic dark room. What we want to know now to make the picture complete is a little history of caravan photographic experience. To the ordinary villager a caravan is a caravan, and the difference between the peripatetic "likeness taker" and the aristocratic amateur photographer is not apparent. Hence very odd episodes must inevitably happen, and anyone who goes in for photography on wheels should have some curious stories to tell. We are inclined to exclaim with Sir Toby Belch, "Why are these things hid?"

It is rather rash to depend upon what is called a *post mortem* photograph as evidence of identity. A curious incident has just been reported. Some six months ago a man was found dead in bed in a common lodging house in Southwark. The body was photographed by the police, and buried as unidentified. About a month ago, a woman whose husband had been missing for twelve months was shown the photograph at Scotland Yard, and at once identified it as being the portrait of her husband, who was insured for £17. She forthwith made an affidavit, obtained the money, put on widow's weeds, and mourned her husband as dead. About a fortnight since she was startled by her husband—who had been to America—reappearing, and it is only fair to the widow to say that she at once recognised him, and received him in the most affectionate manner. The most disagreeable part of the business will probably be the returning of the £17.

THE STUDIO IN SUMMER-TIME.

BY JOHN A. TENNANT.

Now that the summer days are fairly upon us, a few remarks upon the studio in summer-time may not be out of place.

It is a great mistake to think, as many country photographers do, that the best way of obviating the difficulties supposed to be connected with studio work in summer, is to flee the glass-house and erect a temporary canvas arrangement in which to do what operating is required during the hot season.

The photographer should realize that in his skylight, and in his experience of the facilities of lighting which it offers, lies his chief strength as a picture maker. Furthermore, his past experience will show him that portraits taken in the open seldom or never equal those manipulated under the skylight.

Nor is there any real need to desert the carefully planned studio, for there are many simple contrivances by which it may be kept cool and attractive for summer patrons. The plan recently suggested in this magazine, of arranging a supply of water along the ridge of the glass roof by means of a perforated pipe through which the water could flow in a thin stream over the whole surface of the roof, is admirable, and will commend itself wherever practicable. Another plan is to erect a perpendicular screen above the roof so as to shield the glass area from the direct rays of the sun, by which coolness may be secured in some measure. A simple arrangement of hinged ventilating traps along the top of the walls, so placed as to secure a current of cold air along under the roof, would also be of great service; besides which the side-lights should be fitted in grooves, and be made to slide back, and so throw the whole side of the studio open if required. Much, too, depends upon the interior furnishing of a studio as to whether it appear hot or cool. In the first place, all heavy curtains, mats or rugs, surplus backgrounds, heavily upholstered furniture, dirty screens, and accumulations of apparatus should be cleared out, and clean, light-coloured curtains and screens, rush or rattan chairs, with straw matting, take their place. As little apparatus as possible should be allowed to stand about in the studio during summer. The bellows of the camera should also be dusted and oiled—somehow this item never seems to have any attention; in all the studios I have known the camera bellows was a perfect dust trap, save on new instruments. Then there should be plenty of big-leaved plants, such as ferns and palms, and these should have plenty of water and attention. Well looked after, a nice collection of such plants always makes a studio cool and inviting. The change of furnishing, if carried out as suggested, will give a new character to your photography, and make your specimen cases perfectly irresistible to would-be patrons, and is sure to bring more business.

Just as the studio requires different treatment at the varying seasons, so also with the other rooms. The reception room, with the aid of a few new pictures, and a light tapestry rug, with tasteful draperies (all of which may be obtained at a trifling cost) at the windows, may be made quite a pretty apartment. A point that should not be neglected is the providing of good, fresh literature for the amusement and recreation of your clients whilst waiting or resting.

The dark room also calls for special attention at this time of the year. Care should first of all be taken to test the non-actinic medium used to guard the room from white light. Often this medium becomes so much bleached as to be unsafe for the purpose for which it is intended. The shelves should be cleared of all unused bottles, empty plate boxes, paper wrappings, remains of winter experiments, and relics of dearly bought but worthless processes, old baths, and all other unnecessary rubbish or dust accumulators. The floor and shelves should never be dusted with a brush or dry cloth, but a damp cloth should be used to prevent any dust arising to work mischief in future hours.

The water-sink—generally a most convenient receptacle for spoilt plates and wrapping-paper—should now be frequently cleansed to avoid bad smells, and all the unmentionable rubbish *under* the sink should be cleaned right out. A continuous supply of water running over the sink, although forbidden by waterworks companies, is a certain cure for evil-doers, and has a wonderful cooling influence during spells of hot weather. The hypo fixing bath smells stale sooner now than in winter, and needs frequent renewal. It is a good rule in summer to mix only sufficient developer to last one day, and to keep it, when mixed, bottled and immersed in tins of water changed often. Another point is that the developer may be considerably weaker in summer than in winter with advantage. By using slower plates, and developing with weaker solutions than ordinarily used, softer and more detailed negatives of light-coloured stuffs may be obtained than otherwise. This point will be sufficient to help many to attain greater success in photographing ladies or children clad in light-coloured or white dresses.

The work-rooms and printing-room should be carefully overhauled before the hot, dusty days come. Such rooms, and the printing-room in particular, require a thorough cleansing to keep them sweet and in good condition. The suggestions here given, with others, which different circumstances will make evident to the thinking photographer, will go a long way to make the gallery in summer-time far from the stuffy, uncomfortable hole it generally is in small country towns.—*Wilson's Photographic Magazine.*

A Remedy for Green Fog.—Soak in a solution of bichromate of potash, and afterwards wash thoroughly in water.—*Wilson's Photographic Magazine.*

The peculiar branch of photography which consists of taking a series of instantaneous photographs of objects in motion, as developed by Anschütz, Muybridge, and others, and described in this magazine at various times, has received from the French the name of chrono-photography.—*Wilson's Photographic Magazine.*

Lantern Slides.—M. Lirondelle, of the Photographic Society of the North of France, gives the following process for making on gelatino-bromide plates positives for the lantern: A contact exposure is made; the light used is from a piece of ribbon of magnesium 3 centimetres in length by 2 millimetres in width ($1\frac{1}{4}$ inch by $\frac{1}{12}$ of an inch), and the pressure-frame is placed 40 centimetres (16 inches) from the luminous focus. To develop, plunge in a bath formed of two-thirds of neutral oxalate of potash at 30 per cent., and one-third of bromide of potassium at 12 per cent. At the end of a few moments pour, drop by drop, whilst agitating the bath, a very small quantity of a solution of proto-sulphate of iron, and wait a few minutes for the coming of the image. Use no more of this last solution unless the image is too slow in making its appearance, and allow the development to go on. If the image is too weak, increase the quantity of iron, but only at the end, and when it is found to be indispensable in obtaining the desired intensity. Fix, and afterwards wash. By this process the positives are clear and remarkably brilliant.—*L'Amateur Photographe.*

TREATING FLEXIBLE PLATES.

BY M. BALAGNY.

We have ascertained that the use of alum after development produced on flexible plates an effect that rendered manipulation difficult. It was necessary to first learn if it was the support or the gelatine film that caused cockling. For this purpose we made several negatives, and we detached the gelatine film from its support. The support remained absolutely flat, consequently it was the gelatine that caused the cockling. But we also discovered that this effect is produced more strongly when the gelatine film has been alumed before or after fixing. We have, therefore, done away with the use of alum. We have also done away with alcohol in the glycerine bath, which produces the same effect as alum, and which may sometimes, also, shorten the length of our negative. We want our flexible plate to be able, more than any other preparation, to give scientific results. For this it is necessary that the gelatine film should be rendered absolutely inextendible in the fullest acceptation of the word. To do this we have entirely modified the mode of drying. This is our present mode of operating: The negative, after developing, is washed and fixed. If we have reason to fear the yellow colouration, pass in citric acid at two per cent. before fixing, which is done in a solution of hyposulphite of twenty per cent. After fixing, wash well the flexible plates, and plunge them in a bath composed of:—

Water	1 litre
Glycerine	30 to 40 c.c.

Leave the plates in this bath two hours, or all night if not hurried in the printing. It is absolutely necessary that each negative should absorb a small quantity of glycerine, an operation that has for its object to give it more flexibility. It is well to change the place of the negatives in the dish of glycerinated water, especially if many had been placed together in this dish. This being done, varnish—a very easy operation—with lac varnish and water. This varnish, called hydrophite, is now found almost everywhere. It is poured over the flexible plates whilst they are still wet. The plate is taken from the glycerinated water and placed on a glass plate rather larger, so that the lower right-hand corner of the flexible plate exactly coincides with the lower right-hand corner of the other plate; the gelatine film should be on top, of course. Make the same disposition of a second, then of a third negative, and allow them to drain for about five minutes against the wall. Afterwards take the first and float on the surface a coat of varnish. With a badger blender, or with the finger, direct the liquid so that it covers the whole of the negative, and pour off the excess of varnish into a glass. Give at once a second coating of varnish, which has been placed ready for use on another glass, and pour off the excess into the first glass in order to prevent air-bubbles. Now drain. Each negative should be varnished in this manner. After a drainage of five minutes, raise each plate from the glass on which it is found, place it flat with the film on top on a sheet of bibulous paper. All the negatives are thus placed side by side, and allowed to dry on a table. Once dry, the negatives are absolutely plane, and show no tendency to cockle. Moreover, they have undergone neither extension nor shrinking; their dimensions are exactly similar to that of the flexible plates before being placed in the frame. It is possible to do away with varnishing, but we recommend it very strongly. In this case it is well to sponge the coating on coming from the bath, so that no trace of glycerine remains on the surface of the negative, as the glycerine might, later, at the time of printing on albumenised paper, give rise to spots. But in sponging with a fine sponge steeped in pure water, and then pressed between the fingers to free it from all excess of water, spotting is no longer to be feared.—*Moniteur.*

Literary Notice.

Leçons Elementaires de Chimie Photographique, by L. Mathet. (*Société Générale d'Editions, Paris*, 1890.)

This is a new dictionary of photographic chemistry, a volume of 726 pages, containing information on the subject down to the latest date. Its author, M. Mathet, is a *chemiste pharmacien de premiere classe*. In dealing in the book with chemical substances, he states what qualities they possess likely to be of use in photography, and the theoretical reasons why they should be so employed. He also tells how to manufacture the said substances when the method of manufacture is of a simple nature, likely to be within the means and grasp of the photographer. He also tells how to detect impurities in purchased photographic chemicals.

In the course of an article on toning with the salts of platinum, he says that the chloroplatinite of platinum may be purchased ready-made, or the common tetrachloride of platinum of commerce may be approximately reduced, and used for the same purpose, by boiling it with a weak solution of tartrate of soda, containing one gramme of the latter salt to every four grammes of tetrachloride of platinum. The weak solution has to be boiled until its yellow colour changes to dull grey; its volume is then made up to one litre with distilled water, and is acidified by means of five grammes—which seems a great deal—of pure sulphuric acid. Vegetable acids will not preserve the toning bath long, especially when it is exposed to light.

The experience of M. Mathet with eikonogen is:—

1. The time of development is notably shortened—we presume in comparison with that of ferrous-oxalate, the favourite developer on the Continent. Even when the exposure has been very short the image comes out well.

2. The bath does not, relatively speaking, discolour much by exposure to the air, and there is no fear of its staining the gelatine; the image keeps clear and without fog; the developer does not stain the fingers of the operator.

3. The colour of the reduced silver, not being modified by accidental staining of the gelatine, such as that given by pyrogallol, has a blackish blue tone which favours rapidity in printing; the colour of the image approaches that given by ferrous-oxalate.

4. Several plates can be developed successively in the same bath without any appreciable difference in appearance.

The author then devotes a few pages to the subject of getting density with eikonogen.

Altogether, the work is a useful book of reference for the photographer.

The London and Provincial Photographic Association.—The subject for August 7th will be "Home Portraiture;" the discussion thereupon will be opened by Mr. W. E. Debenham. Bank Holiday outing, St. Albans; train 10.24 a.m. from Moorgate Street. Visitors invited.

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

I.—WHAT IS A PERFECT NEGATIVE?—DENSITY, OPACITY, TRANSPARENCY.

THE production of a perfect picture by means of photography is an art; the production of a technically perfect negative is a science.

A perfect negative demands, in the first place, a perfect plate, and as the manufacture of dry sensitive plates is a large and rapidly growing chemical industry, we need offer no apology for bringing this subject before this Society.

Our researches, which have covered a period of over ten years, were made with a view to rendering the production of perfect negatives as far as possible a matter of certainty.

What is a perfect negative? A negative is theoretically perfect when the amount of light transmitted through its various gradations is in inverse ratio to that which the corresponding parts of the original subject sent out.

The negative is mathematically the true inverse of the original when the opacities of its graduations are proportional to the light reflected by those parts of the original which they represent.

Before we can clearly understand this definition, it will be necessary to state shortly the laws of absorption of light by opaque black substances, and to define clearly the meaning we attach to the terms opacity, transparency, and density of a negative. It is the more necessary to do this, as the whole of our investigations depend upon these laws.

For substances which do not reflect much light, such as black opaque bodies, or transparent coloured bodies, the relation between the light absorbed and the quantity of the substance present is very simple. If between the eye and a source of light we place a thin layer of dilute Indian ink, that layer absorbs light, and thereby reduces the intensity of the light transmitted. Assume that such a layer absorbs one-half of the light, then one-half of the light will be transmitted. Whatever may be the intensity of the original light, the intensity after passing this layer of ink will be one-half of what it was. The interposition of two such layers will reduce the light to one-fourth the original intensity; three such layers will reduce it to one-eighth, and so on, each layer reducing the intensity to one-half of what it receives.

Had the first layer allowed one-third of the light to pass through, then two such layers would reduce the intensity to one-ninth, three layers to one-twentyseventh, &c. In general, any number of layers would reduce the intensity of the light to a fraction which is equal to the fraction the first layer allows to pass, but raised to a power the index of which is the number of layers employed. If n equal layers were employed, and the first one reduced the intensity of the light to a fraction $\frac{1}{m}$, the n layers would reduce it to $\left(\frac{1}{m}\right)^n$.

If, instead of using so many successive layers, the first layer were made to contain as much Indian ink as the n successive layers contain altogether, we should find that the one layer now reduces the intensity of light by exactly the same amount as the n layers did. The reduction of the intensity is, of course, due to the black particles, and depends simply upon the number of them which are interposed per unit of area. We can thus replace the number of layers by the number of particles, and the law takes this form: The intensity T_x of light, after passing A molecules of a substance, is a fraction of the original intensity T, such that—

$$\frac{Tx}{T} = \left(\frac{1}{C}\right)^A.$$

For purely mathemathical reasons the fraction $\frac{1}{C}$ is usually expressed as a negative power of the base of the hyperbolic logarithms E, say $\frac{1}{C} = E^{-k}$, and we can write—

$$\frac{T_x}{T} = E^{-kA}$$

where k is called the coefficient of absorption. This form of the law we shall frequently use again. The fraction $\frac{T_x}{T}$ represents and measures the *transparency* of the substance. The inverse of that fraction, or $\frac{T}{T_x} = E^{kA}$, measures the *opacity* of the substance. It indicates what intensity of light must fall on one side of the substance in order that unit intensity may be transmitted.

In our investigations we use the letter T to denote transparency, and O to denote opacity, and the two symbols are related thus:—$O \times T = 1$.

We must further define what we mean by density as distinct from opacity. By density we mean the number of particles of a substance spread over unit area, multiplied by the coefficient of absorption; kA is what we term density, and mark by the letter D.

For our purposes, *i.e.*, in its application to negatives, the density is directly proportional to the amount of silver deposited per unit area, and may be used as a measure of that amount.

The relations between the three terms, transparency, opacity, and density, are the following:—

$$T = E^{-D}$$
$$O = E^{D}$$
$$D = \log_E O = -\log_E T.$$

The density is the logarithm of the opacity, or the negative logarithm of the transparency.

These relations hold good for some substances with regard to ordinary white light, for others only with regard to monochromatic light, and for others they do not hold good at all. We have satisfied ourselves that they do hold good for the silver deposited as a black substance in negatives as long as the silver does not assume a metallic lustre, and reflects but a very small amount of light.

By means of these definitions we are now in a position to trace the connection between the densities of a theoretically perfect negative and the light intensities which produced them.

Since the density is the logarithm of the opacity, and since, in a theoretically perfect negative, the opacities are directly proportional to the intensities of the light which produced them, it follows that each density must be proportional to the logarithm of the light intensity which produced it. (More correctly, the density is a linear function of the logarithm of the intensity of light and time of exposure.)

The result is this: In a theoretically perfect negative, the amounts of silver deposited in the various parts are proportional to the logarithms of the intensities of light proceeding from the corresponding parts of the object.

* This paper is quoted by permission from the *Journal of the Society of Chemical Industry*. The full title of it, as given by the authors, is "Photo-Chemical Investigations, and a New Method of Determination of the Sensitiveness of Photographic Plates."—ED.

The question arises, can such a negative be produced in practice?

In order to answer this question, we had first to find a simple method of measuring the density of the silver deposited in negatives. We have then to study the influence of the developers upon the density of the deposits, and we were then in a position to investigate the action of the light itself.

(To be continued.)

THE PHOTOGRAPHIC IMAGE.*

BY PROFESSOR RAPHAEL MELDOLA, F.R.S., M.R.I.

The photographic image is impressed on a modern film in an inappreciable fraction of a second, whereas the photo-salt requires an appreciable time for its production. The image is invisible simply because of the extremely minute quantity of haloid decomposed. In the present state of knowledge it cannot be asserted that the material composing this image is identical in composition with the photo-salt, for we know the composition of neither the one nor the other. But they are analogous in so far as they are both the result of photo-chemical decomposition, and there is great probability that they are closely related, if not identical, chemically. It may turn out that there are various kinds of invisible images, according to the vehicle or halogen absorbent—in other words, according to the sensitiser with which the silver haloid is associated. The invisible image is revealed by the action of the developer, into the function of which I do not propose to enter. It will suffice to say that the final result of the developing solution is to magnify the deposit of photo-salt by accumulating metallic silver thereon by accretion or reduction. Owing to the circumstance that the image is impressed with such remarkable rapidity, and that it is invisible when formed, it has been maintained, and is still held by many, that the first action of light on the film is molecular or physical, and not chemical. The arguments in favour of the chemical theory appear to me to be tolerably conclusive, and I will venture to submit a few of them.

The action of reagents upon the photographic film is quite similar to the action of the same reagents upon the silver haloids when exposed to the point of visible colouration. Reducing agents and halogen absorbents increase the sensitiveness of the film; oxidising and halogenising agents destroy its sensitiveness. It is difficult to see, on the physical theory, why it should not be possible to impress an image on a film, say, of pure silver bromide, as readily as on a film of the same haloid embedded in gelatine. Everyone knows that this cannot be done. I have myself been surprised at the extreme insensitiveness of films of pure bromide prepared by exposing films of silver deposited on glass to the action of bromine vapour. On the chemical theory we know that gelatine is a splendid sensitiser—*i.e.*, bromine absorbent. There is another proof which has been in our hands for nearly thirty years, but I do not think it has been viewed in this light before. It has been shown by Carey Lea, Eder, and especially by Abney—who has investigated the matter most thoroughly—that a shearing stress applied mechanically to a sensitive film leaves an impression which can be developed in just the same way as though it had been produced by the action of light. [Pressure marks on Eastman bromide paper developed by ferrous-oxalate.] Now that result cannot be produced on a surface of the pure haloid; some halogen absorbent, such as gelatine, must be associated with the haloid. We are concerned here with a chemical change of that class so ably investigated by Professor Spring, of Liege, who has shown that by mere mechanical pressure it is possible to bring about chemical reaction between mixtures of finely divided solids.* Then, again, mild reducing agents, too feeble to reduce the silver haloids directly to the metallic state, such as alkaline hypophosphites, glucose or lactose, and alkali, &c., form invisible images which can be developed in precisely the same way as the photographic image. All this looks like chemical change, and not physical modification pure and simple.

I have in this discourse stoically resisted the tempting opportunities for pictorial display which the subject affords. My aim has been to summarise the position in which we find ourselves with respect to the invisible image after fifty years' practice of the art. This image is, I venture to think, the property of the chemist, and by him must the scientific foundation of photography be laid. We may not be able to give the formula of the photo-salt, but if the solution of the problem has hitherto eluded our grasp it is because of the intrinsic difficulties of the investigation. The photographic image brings us face to face, not with an ordinary, but with an extraordinary class of chemical changes due entirely to the peculiar character of the silver salts. The material composing the image is not of that definite nature with which modern chemical methods are in the habit of dealing. The stability of the photo-salt is determined by some kind of combination between the subhaloid or oxyhaloid, or whatever it may be, and the excess of unaltered haloid which enters into its composition. The formation of the coloured product presents certain analogies with the formation of a saturated solution; the product of photo-chemical decomposition is formed under the influence of light up to a certain percentage of the whole photo-salt, beyond which it cannot be increased—in other words, the silver haloid is saturated by a very minute percentage of its own product of photo-decomposition. The photo-salt belongs to a domain of chemistry—a no-man's land—peopled by so-called "molecular compounds," into which the pure chemist ventures but timidly. But these compounds are more and more urging their claims for consideration, and sooner or later they will have to be reckoned with, even if they lack that definiteness which the modern chemist regards as the essential criterion of chemical individuality. The investigation may lead to the recognition of a new order of chemical attraction, or of the old chemical attraction in a different degree. The chemist who discourses here upon this subject at the end of the half-century of photography into which we have now entered, will no doubt know more about this aspect of chemical affinity; and if I may invoke the spirit of propheey in concluding, I should say that a study of the photographic film with its invisible image will have contributed materially to its advancement.

* Concluded from page 581.

* The connection between the two phenomena was suggested during a course of lectures delivered by me two years ago ("Chemistry of Photography," p. 191). I have since learnt that the same conclusion had been arrived at independently by Mr. C. H. Bothamley, of the Yorkshire College, Leeds.

PHOTO-ENGRAVING AS A BUSINESS.

During the past two or three years we have repeatedly drawn the attention of progressive photographers to the lucrative openings constantly recurring in the evolution of photo-engraving as an illustrative art. The ever-increasing demand for men skilled in this and photo-mechanical processes, together with the engaging prospects this youngest of professions holds out as inducements to its followers, have led us to embody here a few ideas which may help some who are looking for a better condition of things than photography in the studio affords.

Photo-engraving is a process by means of which a drawing in line or half-tone, a photograph, a water-colour or oil painting, or anything depicted by lines, colours, or tones, may be reproduced upon a zinc, copper, or steel base, and printed from the printer's press together with descriptive matter. The same end has, for many years, been accomplished, in some slight measure, by wood-blocks, upon which the design to be printed was cut by hand. This latter proceeding, however, had numerous disadvantages, amongst which we might mention that the success of the resulting picture depended wholly upon the fidelity of the work of the wood-cutter; also that the process was tedious and slow, requiring considerable skill on the part of the workman; consequently, the work was costly; and, beyond all this, there remained the fact that to obtain true likenesses of people, places, or things was generally impossible, because of the facilities offered in the wood-block to produce idealised representations of the objects depicted. Photo-engraving obviates all these difficulties, reproducing, as it does, with the actual fidelity of a photograph every detail of light and shade pictured in the original; and doing this, furthermore, within an incredibly short time.

Small wonder, then, can we express when we hear that this latest phase of reproductive art is driving all before it. We do not, however, believe that the spread of photo-engraving will result in the extinction of the branches of wood-cutting, steel-engraving, and the like. No! These have their own place, and will hold it, but without doubt photo-engraving is *the reproductive art of the future*, and, on that score, demands the earnest attention of all interested in photography, which is the fruitful source of this and all similar processes by which half-tone reproductions are obtained.

Now to the point. There are many photographers throughout our country who learnt the art in "wet-plate days," and who have never succeeded in the methods of dry-plate photography now in vogue. To such as these —and they are many—photo-engraving offers even greater inducements than to the modern dry-plate worker. Without a practical knowledge of the collodion process it is useless to try to accomplish anything in photo-engraving, but with this knowledge the workman is already half-way to the goal.

Some little time ago we called attention to an advertisement in a contemporary offering $50 per week to a skilled photo-engraver, and, so far as we know, that offer still holds good.

Anyway, it is absolutely certain that a man "worth his salt" in photo-engraving can obtain a salary all the way from $25 to $50 per week, whilst girls are employed in the lighter departments of the work at salaries ranging from $9 to $20 per week. What we particularly desire our interested readers to note is that, whilst photo-engraving as a comparatively new line of business is open to "live" workers from all allied trades, it is peculiarly open to photographers acquainted with the collodion processes of wet-plate days. The work is lighter and pleasanter than the general run of gallery work; the demand for good workmen is, and for some years will be, a steadily increasing one; the remuneration is greater than photography can offer under similar conditions to similar workmen, and the prospects of advancement are much more promising. In a conversation with Mr. M. Wolfe, of Dayton, Ohio, who produces the most perfect screen plates for photo-engraving purposes we have yet seen, he told us that if he had twelve competent men skilled in this class of work he could put them into good positions right away.—*Wilson's Photographic Magazine.*

MILITARY PHOTOGRAPHY.

Captain Curties, of the Royal Engineers, has written a series of articles on the above subject, which were published in the *Broad Arrow*. In the last of the series he gives a description of his photographic outfit. He says:—

"The one object I have kept in view all through has been to simplify the art as much as possible, and to make each photographic section complete in itself, and able to take, develop, and print a picture without any outside help, in the shortest time possible. Having this end in view, my equipment supplies, in the first place, two light knapsacks, to be carried in a reconnaissance by two mounted officers or men. One contains a very light fold-up camera, capable of taking pictures 10 in. by 12 in., round which is wrapped the focussing cloth. It has not appeared to me desirable to place before a general a view of a country smaller than this. The extra weight would be more than compensated by the comprehensive picture obtained; moreover, in a small plate, I take it, distance would not be fairly and distinctly portrayed. The other knapsack carries three dark slides, very light but strong, each containing two plates. This knapsack also contains the lens, instantaneous shutter, &c. Both knapsacks are made to fit close to the back, and, in addition to the straps passing over the shoulders, are secured to the sword-belt, thus preventing any injurious motion when riding. By the simple act of unbuckling one strap, each can be at once unslung ready to be unpacked. The tripod, which is made as light as can be consistently with strength and stability, is carried folded up in a packet attached to the saddle, and fixes immediately on to the camera. We next proceed to the all-important subject of "developing" in the field. For this purpose I use a tent composed of a large, folding, umbrella-shaped top, made of a material which admits a deep ruby light. When this is opened and fixed in the ground it stands just clear of a tall man's head. Over it is dropped a sort of sack, open at bottom ends, the top end being much smaller than the bottom end, and capable of being drawn together by means of two cords. This sack is lightproof and waterproof. The lower end is held down by means of a light iron hoop or ring, which also folds up to facilitate packing. The hoop is attached to the bottom of the sack in such a way that a border of the material extends beyond it, and rests upon the ground. This, in the ordinary way, is sufficient to keep out light, but should any find its way in, a few handfuls of earth or stones heaped up round the border will effectually keep it out. The stick of the umbrella is a hollow bamboo, open at the top. It is pierced with

holes to about half its length; this ventilates the tent. A cap placed over the top of the stick excludes light, but not air. We now have a complete tent in which a man can move about freely, and use his hands without constraint, and, above all, he is not half stifled, as one generally is in the usual run of developing tents. It can be taken down at a moment's notice, and packed in a very small compass, the whole being exceedingly light and compact. A few stays may be necessary in windy weather to keep it steady. The person about to develop a plate slings over his shoulders, knapsack fashion, a small metal tank, containing sufficient water to wash several plates; attached to it is a gutta-percha tube and tap. Round the waist is buckled a broad leather belt, in which are fixed bottles containing the developing solutions, &c. A light, fold-up trough, with a gutta-percha drain-pipe, carried outside the tent, and two light shelves, hook on to the stick of the umbrella. All that now has to be done is to lift up the walls of the tent, step inside, and develop and print the picture, which, by using bromide paper (undoubtedly *the* process for military use), would take something like a quarter of an hour; the printing, of course, to be done from the wet plate. I may mention that I use scarcely any glass beyond the plates (which I believe in); those articles which are made of glass are protected to prevent breakage. I believe myself that the whole of the articles now made of glass can be manufactured from a preparation of celluloid, which is strong, light, and durable. I hope shortly to have a complete set of bottles and measures made of celluloid."

On Saturday last Mr. Charles Knight, photographer, of Newport, Isle of Wight, had the honour, he says, of photographing H.R.H. the Duke of Connaught in Rifle Brigade uniform. The Prince is honorary colonel of the battallion.

The Fulgur Universal Lamp.—The Fulgur lamp consists essentially of a coal oil lamp whose reservoir contains a porous substance absorbing about two hundred centimetres of petroleum; it is furnished with a chimney of white glass, serving for ordinary lighting, enlargements, and magnesium flash-light, and with a chimney of red glass for lighting the dark room. The petroleum reservoir has over it a smaller reservoir containing magnesium in powder. By means of a faucet a small quantity of the powder is made to fall in a tube entering the flame, through which it is projected by means of a rubber bulb; the small quantity of magnesium smoke is entirely condensed on the chimney. The price of the lamp is 20 marks.—*Deutsche Photographen Zeitung.*

Phosphorescence Produced by Ozone.—Herr Ernst Fahrig says in *The Chemical News*:—"I was in a dark room, and having in my hand a sealed bottle about three-quarters full of a preparation of ozone (in this instance a solution of ozone in water containiug a small percentage of other substances, which I have found in the course of my experience are necessary to retain the ozone in solution), I, with no particular purpose in view, gave the bottle a vigorous shaking up; instantly I saw a soft, phosphorescent glow of light floating above the surface of the liquid and permeating the space in the upper part of the bottle. Its appearance was only momentary; but on shaking the liquid up again immediately afterwards it was observed again, but in much diminished intensity. Further repetition failed to produce any results, but after an interval of ten days the liquid had apparently regenerated its power, and the same effects could be observed, though weaker. I observed the phenomenon in another way, and obtained some especially remarkable results, by pouring a small quantity of an ozone solution into a glass beaker containing ordinary water. At first the cone-like projection of the solution where it falls into the water becomes luminous, and then the light suffuses the whole mass as the liquids become thoroughly mingled, and finally disappears."

PHOTOGRAPHING UPON WOOD.

The Magazinist, *The Century*, *Harper's*, and other popular monthlies use "process" engravings more and more. Photography on wood is their mainstay, and has almost superseded the draughtsman on wood. A sketch, say, a dozen times as large as the proposed engraving is made, reduced by photography, and then put upon the wood.

Photographing on wood by the wet-plate process is done thus: A slight modification of the collodion transfer will no doubt meet all requirements. First make a reversed collodion transparency in the camera from the negative. A tough and horny collodion should be used. Develop with—

Pyrogallic acid	100 grains
Citric acid	60 ,,
Acetic acid	2 ounces
Water	20 ,,

and fix in hyposulphite of soda. Coat the wood with the following hot solution of gelatine:—

Gelatine	4 ounces
Water	1 pint

Dissolve the gelatine by placing in a vessel of warm water, and then add 4 grains of chrome alum and mix thoroughly. The wood, having been coated, is allowed to dry. The gelatine surface is then moistened with water for ten or fifteen minutes, and the transparency, still wet from the washing water, is laid down upon it and pressed lightly in contact, and allowed to dry under slight pressure. When dry, the collodion readily leaves the glass, and remains in contact with the block.

Here are some further points: The plate is cleaned as usual, and dusted with powdered talc and polished off; it is then coated with positive collodion, sensitised and exposed as usual, fixed with cyanide of potassium, and placed in a dish of warm water. In the meantime, have your block blackened by rubbing drop black on it, or ordinary blacking, and coat and drain well with a solution of the commonest glue you can get, 1 ounce to 12 ounces of hot water; the common glues are the best, for they take a much longer time to set than better ones, and so you can get a much thinner coat with draining. Place your block in a vessel of water, having it immersed about three inches, then bring your photo from the dish, place it over the block and under the water. You will find by touching the edges of the film it will readily leave the glass; you can then turn it about any way under the water, and when in position raise your block gently out of the water, bringing the film with it; if it is puckered at all, it is owing to raising too roughly, and must be placed in the water again. If satisfactory, place at an angle to drain, and dry in warm, airy place. The whole operation, from focussing to getting the block ready for drying, will not take a practised hand more than twenty minutes. The common glue will not block the tool at all if you drain the block well, and when cut all can be removed immediately with a sponge and warm water. I may add that a very good way to black the block is to hold it over a petroleum lamp with its chimney removed. The glue-water will not come off it if applied in the same manner as applying varnish to a negative, and under no circumstances be induced to use a black varnish, for it is next to impossible to do a good job, for the graver slips as if it were cutting on glass.—*Wilson's Photographic Magazine.*

At the Photographic Club the following subjects will be considered:—Wednesday, August 6th, "New Hand-Cameras"; August 13th, "On Extemporising Apparatus."

Patent Intelligence.

Applications for Letters Patent.

11,420. JOHN LEWIS, 99, Gladstone Road, Birmingham, "Improvements in Photographic Printing Paper."—July 22nd.

11,431. H. SIMPSON, 26, Castle Street, Liverpool, "Photographic Apparatus."—July 22nd.

11,476. G. MATTIOLI, 45, Southampton Buildings, London, "Photographic Apparatus."—July 22nd.

11,478. J. R. GOTZ, 433, Strand, London, "Photographic Film Holders."—July 22ud.

Specifications Published.

14,220. *September 9th*, 1889. — "Photographic Focussing Magnifiers." FRANK BISHOP, of the firm of Marion and Co., 22 and 23, Soho Square, London, W., Dealers in Photographic Materials.

This invention, which has already been described in these pages, has for its object to provide a means whereby a focussing magnifier, sometimes used in focussing a picture in the photographic camera, may be temporarily fixed against the focussing screen in position for viewing the image, so that the hand of the operator, instead of being occupied in holding the magnifier, is at liberty to make the necessary adjustments of the camera.

The inveution consists in the combination with the focussing magnifier of a suction device in the form of an india-rubber cupped disc which, when pressed flat agaiust the focussing screen, remains adherent thereto by atmospheric pressure, in the manner of a sucker, with sufficient tenacity to support the focussing glass in position against the screen, and permit of its being shifted about thereon.

14,270. *September 10th*, 1889.—"Photographic Shutter." HENRI TRUNBERRY, Manufacturer of Photographic Shutters, 22, Rue de Bretagne, Paris.

This invention has for its object to provide a new form of shutter for photographic cameras.

This shutter may be employed at will for effecting instantaueous exposure, or exposures of which the duration may be regulated as desired. It is actuated by a compressed air piston, through an india-rubber tube terminating in a pear or ball as usual.

The piston alternately moves two slides, which constitute the shutter apparatus properly so called, from top to bottom, and which, in sliding vertically one in front of the other, alternately open and close the objective opening of the apparatus. The two slides are respectively actuated one by the other, each of them being provided on its side with a rack, the teeth of each of which engage at the same time with a pinion common to both, and which turns freely on its axis under the impulse given by either one of the said slides when itself actuated by the piston.

It will be understood that no matter which of the said slides is caused to move upwards by the piston, its movement in that direction, at the same time, through the action of the common pinion, imparts the opposite movement—that is to say, the downward movement—to the other slide. They therefore slide one over the other, and thus in succession produce the opening and closing of the objective opening. The alternate action of the piston upon the two slides is regulated by two springs in the form of elongated arcs, which alternately force the said piston under each of the slides. These two slides, in descending aud rising, themselves counteract the said spriugs, and render them free in succession.

. The above description applies to what is called instantaneous exposure.

For exposures of varying duration the travel of the slides is controlled to a given extent. Such limitation is effected by means of a bolt which arrests the upward movement of one of them, and through it the downward movement of the other slide, the action of the one being governed by the other, as above described. This bolt is actuated in a horizontal direction by a pin cut off slantingly, and which enters vertically a transverse slot formed in the said bolt, and which is also made slanting. An opposing spring placed in the bottom of the socket or box in which the bolt is confined pushes it automatically each time the pin in rising renders it free. This pin, and the slot which it enters in the bolt, are correspondiugly inclined, as above stated, and slide one over the other with a gentle friction. It will be understood by this that, when the finger of the operator presses on the said pin, the latter pushes the bolt which limits the travel of the two slides to the bottom of its socket, and at same time coupressess the opposing spring. When, on the contrary, the finger is withdrawn, the opposing spring, by expanding, then forces the bolt in the direction of the slides, and causes the pin to itself rise to its position of rest. In the latter position the shutter is adapted for what is known as varying exposure, the duration being, as it is easy to understand, regulated by the operator by means of the pin already described.

Besides what has been above described, a special arrangement enables the diameter of the objective opening to be reduced, with the object of enabling the shutter to be readily adapted to different sized apparatus.

This arrangement consists of a ring which is not entirely closed, and which forms the orifice itself, or the inner edge of the opening in the shutter, and which may be diminished or increased alternately under the pressure of two cylinders, screwed one over the other, and between which it is imprisoned. To produce the effect indicated, the said ring is broken at a point in its circuit, and its extremities are made so that when being decreased they slide one into the other. Further, the body of the said ring is triangular in cross section, the apex thereof being the external edge, while the base is, on the contrary, the internal edge of such ring. It will, therefore, be seen that the two cylinders, by screwing one on to the other, lessen the space left between them, and within which the ring for regulating the opening is enclosed, and consequently progressively press the said ring, and drive it towards its centre, thus producing its coutraction and diminution.

The reverse effect will, on the contrary, be produced by unscrewiug the two cylinders.

WE have reason to believe that one of the aluminium alloys will come largely into use in the photographic apparatus of the future.

A CELLULOID VARNISH.—It is not generally known that the best varnish for celluloid films of all kinds is a plain, spirituous celluloid solution. This is made of old celluloid film negatives from which the gelatine coating has been removed. The celluloid is cut into small trimmings and dissolved in common alcohol. This varnish is applied to the film in a cold state, and dried slowly without the application of heat. It flows smoothly and sets evenly, if made of the proper consistence. It has a greater degree of toughness than any resinous varnish, and has the additioual advantage of being entirely devoid of "tackiuess."—*Wilson's Photographic Magazine.*

LETTERING PRINTS.—M. Stravos Zellis, of Alexandria, recommends the following process for marking or lettering on the sensitised paper such uames as we wish to give the prints. He takes a piece of thin white paper, and traces upon it the words which he wishes to have at the bottom of his negative, and oils it on both sides. Having removed the excess of oil by rubbing it between two sheets of bibulous paper, he coats it with varnish on both sides, and allows it to dry. On the other hand, he removes from the bottoun of the negative a portion of the gelatine equal to the size of the paper, and substitutes for it the paper, which he sticks by means of a solution of gum arabic and water. He removes then the air-bubbles, which would prevent complete adherence, aud, this being done, waits for his work to dry. If, when printing on the sensitised paper, it is found that the letters do not show very white, the defective portions should be retouched on the back of the oiled paper. To write his name, M. Zellis makes use of a mixture of gum arabic, lampblack, and water. This process is simple, cheap, and gives excellent results.—*Annals Photographique.*

Correspondence.

COPYRIGHT LAW.

Sir,—In your "Notes" of last week, on page 575, you say: "This decision in the case of photography involves a certain amount of absurdity, because it is clear that one man may pose the sitter, and make all the arrangements, and be responsible for the art qualities of the picture; while the other man does no more than take off the cap and develop the plate. Yet the mechanical operator is deemed the author!" The decision you refer to is, I understand, that of Mr. Justice Wills in Kenrick *v.* Lawrence. If that is so, it seems to me that your note is somewhat misleading, as this case only decides that where one person directs another to make a drawing of a given subject, it is not the person by whose direction the drawing is made who is the author within the meaning of the Copyright Act. The judge did not decide who was the author, as it was unnecessary for him to do so, but at the end of his judgment he suggests that possibly they may both be joint authors.

The decision in this case is substantially the same as that in the other one to which you refer, namely, Nottage *v.* Jackson. It will be remembered that in that case the plaintiffs directed one of their assistants to go to the Oval and photograph the Australian cricketers in a group, and it was decided that the plaintiffs were not the authors of the photograph.

Who is the author of a photograph is a question of considerable difficulty, unless the whole of the work has been done by one person; but the Master of the Rolls, in giving judgment in the latter case, said, "The nearest I can come to is that it is the person who effectively is, as near as he can be, the cause of the picture which is produced, that is, the person who has superintended the arrangement, who has actually formed the picture by putting the people into position, and arranging the place in which the people are to be—the man who is the effective cause of that. Although he may only have done it by standing in the room and giving orders about it, still it is his mind and art, as far as anybody's mind and art are concerned, which is the effective cause of the picture, such as it is, when it is produced."

Hence, it seems that if one person poses and arranges the sitter, and another merely takes off the cap and develops the plate, then it is the former, and not the mechanical operator, who is the author of the photograph. In many cases, however, in which more than one person has been engaged in the taking of a photograph, it would probably be better to register them all as joint authors. C. Fleetwood Pritchard.

3, *Paper Buildings, Temple, E.C., July 29th*, 1890.

AMATEUR PHOTOGRAPHERS IN BOURNEMOUTH.

Sir,—At this time of the year you have, doubtless, many inquiries from amateur photographers as to facilities in this town for changing and developing plates, &c. I shall be glad if you will kindly refer such correspondents to me.

Stewart Hardwick.

21, *Commercial Road, Bournemouth, July 24th*, 1890.

Grey Bromide Prints.—To give a grey tone to prints on bromide paper, the *Photo. Mittheilungen* quotes M. Senier as recommending the alteration of the bromide to chloride by the use of a solution of chlorine (chlorine water), followed by redevelopment with oxalate or pyro, with the addition of considerable bromide. A red tone will be given by the addition of 4 parts of potassium bromide to 100 parts of the developer.

Photographic Periodicals.—The leaves of Vallombrosa and the multitudinous waves of the sea are simply not in it for numerousness with the new photographic periodicals which are sprouting hopeless around us. The latest edition—up to date of writing—which we have to welcome to the galaxy is the *Photographischen Neuheiten*, which appeared about the 1st of February in Berlin. It is under the protection of the house of Romain Talbot, and the editorship of Mr. Robert Talbot. It will appear monthly in French, English, and German editions.—*Wilson's Photographic Magazine.*

Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting on the 24th inst. Mr. H. M. Smith occupied the chair. The subject for the evening's discussion was "Printing through Coloured Media."

The Hon. Secretary exhibited two slips of silver albumenised paper that had been sent to him by Mr. Otto Schölzig, showing the comparative actinic values of different coloured glasses. Different sections of the strips of paper had been exposed for a given time under dark yellow, ruby, blue, dark green, single green, and orange coloured pieces of glass. One strip of paper was left untoned for comparison of the colour of the deposits.

Mr F. A. Bridge read an extract from an article he had written in the Photographic News Year-Book of 1873, advocating the use of a thin sheet of green or pale red gelatine in printing from a thin negative, thereby getting a better result.

Mr. W. E. Debenham said that it had been asserted that with a certain class of negative a better and brighter effect was obtained by slow printing on a weak light than by exposure to a strong light; this he denied. He showed four prints on as many sections of a sheet of silver albumenised paper, all made from the same negative, using different coloured pieces of glass, and exposing from ten minutes to twenty hours in a weak light. No difference was noticeable in either of the prints except the exposure made under a piece of brownish orange glass. This Mr. Debenham accounted for by stating that the difference probably arose from the organic compound of silver being insensitive to orange light.

Mr. T. E. Freshwater showed some bromide prints developed with eikonogen of the last outing of the members at Wanstead Park.

Mr. F. A. Bridge showed an enlargement from a quarter-plate negative taken at Chester of some interesting carvings on one of the old houses.

The Chairman, as one of the delegates appointed to represent the Association at the Chester Convention, gave his report about the same.

The Bank Holiday outing on Monday next was arranged to take place at St. Albans.

Birmingham Photographic Society.

At the ordinary meeting of the above Society on July 24th, held at St. Edmund's College, Mr. W. Griffiths gave a very interesting paper on "Stereoscopic Photography." The lecturer described the different apparatus required and mode of working, and illustrated his remarks with a number of beautiful stereoscopic slides on paper and glass.

Mr. W. J. Harrison, F.G.S., who was in the chair, complimented Mr. Griffiths on his instructive paper, and said he was sorry a larger number of members had not availed themselves of the pleasure of hearing the paper.

Messrs. Karleese, Middleton, Taylor, and others took part in the discussion which followed.

The result of the first photographic competition towards the Warwickshire Photographic Survey was announced. A gold medal was offered by Mr. S. G. Mason, a silver medal by the Society, and a bronze medal by Mr. A. Constantine for six photographs taken in Warwickshire at places accessible to the general public; to be taken between March 1st and June 30th. Three to be open landscapes, part of each to be a river or stream, and three to be of a rustic cottage or cottages; the six prints to be exhibited on one mount. The awards were offered for excellence of the group of photographs, artistically and technically; the negatives of the prize photographs to be placed at the disposal of the Photographic Survey of Warwickshire Committee. The photographs were sent to Mr. George Bankart, President of the Leicester Society, to judge, who awarded the prizes as follows:—Gold medal—Benjamin Karleese, "Light and Truth;" Silver medal—Arthur J. Leeson, "Cannon;" Bronze medal—W. Jerome Harrison, "Avon."

On Saturday last a good number of members and friends took part in the monthly half-day excursion, Warwick being the *rendezvous* for the afternoon. A pleasant afternoon was spent under the leadership of Mr. George A. Thomason, when over 100 plates were exposed.

THE BATH PHOTOGRAPHIC SOCIETY.

ON Saturday, the 26th inst., the Society met at Prior Park, by invitation of the Rev. Canon Williams, the principal of the College. The grounds are some 200 acres in extent, and present many picturesque subjects for the camera. Prominent amoug them stand three handsome piles of buildings, with the mansion in central position, 150 feet wide, with a Corinthian portico of six columns, and the two wings used as colleges, and dedicated respectively to St. Peter and St. Paul. A church has also recently been added for the convenience of worshippers in the district. The interior is richly ornamented with carving in alabaster imported from Rome. It is lofty and well lit, a large and valuable Vandyke of Jesus being easily photographed along with the interior; when quite finished the floor will be of white marble throughout. There is also a private chapel, or chapel royal, in the mansion, said to have been intended for the use of George III; it is unique. These buildings take the form of a crescent, are situated ou a slope 400 feet above the Avon, and are generally considered to command a landscape full of Italian beauty. Far away down the slope so richly friuged with woods, and spanning the expansive fishponds, stands the Palladium Bridge, well known to visitors.

At five p.m. the party assembled under the portico of the mansion, where the Canon welcomed his fellow members to tea; Mr. and Mrs. Austin J. King and Miss King assisted in dispensing hospitality to the guests. After tea more photographs were taken, and the swimming bath, priory, and other points of interest visited. The sky being cloudy, with occasional showers, the light was too weak for many subjects, but some good and picturesque photographs were nevertheless obtained.

THE DAGUERRE MEMORIAL.

THE committees which have been appointed by the Photographic Association of America, with and by Chairman McMichael, of the general committee, are as follows:—

The General Committee.—H. McMichael, G. M. Carlisle, O. P. Scott, J. M. Appleton, G. H. Hastings.

The Washington Committee.—E. J. Pullman, Thomas W. Smillie, Hon. A. A. Adee, A. Dickinson Jewett, Dr. Griffiths, U.S.N.

The Chicago Committee.—Gayton A. Douglass, Richard Sweet, Thomas Pattison, O. P. Scott, Dr. John Nicol.

The St. Louis Committee.—G. Cramer, M. A. Seed, J. C. Somerville, H. A. Hyatt, F. W. Guerin, W. H. H. Clark.

The Philadelphia Committee.—W. J. Entrekin, W. P. Buchanan, John G. Hood, Edmund Stirling, J. Carbutt, J. Bartlett.

The Boston Committee.—George H. Hastings, W. H. Roby, T. H. Blair, Wilfred A. French, C. A. Chandler.

The New York Committee.—J. Wells Champney, H. Littlejohn, Edward L. Wilson, Ph.D., Dr. Arthur H. Elliot, W. 1. Lincoln Adams.

Each of these committees holds a book of certificates for subscribers to the fund, and is authorized to give receipts.

BICHROMATE OF SODA IN PHOTOGRAPHY.—J. Husnik recommends the employment of the bichromate of soda in place of the bichromate of potash in all the processes where a salt of chromium is used, such as zincography and photo-lithography. Not only, he says, does the soda salt contain more chromium in a given weight, and is more than a third cheaper; but it also has the advantage of being far more soluble in water than the other, thus has not its tendency to crystallize out when dextrine or gelatine is added to the solution. He states that he has used it with entire success in all his processes for some time past.

Answers to Correspondents.

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

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

H. S.—*Cabinet Vignettes Showing Brush Marks.* Since communicating with you last week we have taken occasion to test the cards upon which the photographs are mounted. We can find nothing in them to account for such defects, for the boards are absolutely free from bleaching chlorides, sulphites or hyposulphites, and the edges are finished with pure gold. It would seem, therefore, that the mountant was at fault.

PHOTARGUS.—*Lead Pipes for Rain Water Supply.* Although it may happen that rain water acts slightly upou pure lead, the quantity of metal dissolved is so excessively minute that it is impossible to believe that such traces could exert any appreciable effect in photographic operations. Tin piping is absolutely safe, or even the alloy of lead and tin known as "composition pipe," but you must attach them to a slate cistern or water butt, for if put in contact with a lead-lined reservoir there is always increased danger of metallic corrosion, as the consequence of galvanic action being set up between dissimilar metals.

E. O. C. (Boston Photogravure Company, Mass.)—In a letter dated July 15th, our correspondent makes an excellent suggestion for overcoming irregularities in the development of celluloid films, by cementing them down with Canada balsam upon a plate of glass before proceeding to apply the chemicals. He thinks this idea may be worthy the attention of Colonel Waterhouse, who found difficulties in making enlargements from celluloid films in consequence of the varying thickness and opacity of the material he employed. The further details promised by our correspondent will be very acceptable; meanwhile we thank him for this letter already to hand.

J. M. B.—*Spots of Reversed Action.* Your communication is extremely interesting and important; we have never seen the effect produced in this way before, although the end windows of churches and other interiors very frequently show halation and reversal.

PERISHED.—*Red Rubber Bulbs and Tubing.* The pneumatic apparatus attached to instantaneous shutters very often gets rigid and rotten, and has to be replaced. A short immersion in warm water helps to make it serviceable for a time, but the change is due to oxidation of the caoutchoue, and is inevitable.

L. T.—*Liesegang's Fixing Bath.* The precipitate which you noticed may have resulted from the action of the alkali in the gold toning bath upon the magnesium salt, in throwing down the carbonate or hydrate of magnesia. Be careful to wash the toned prints well before immersion in the fixing liquor.

M. E.—*Pyro and Ammonia Developer.* This is very apt to stain the film wheuever the development is prolonged; try the substitution of carbonate of soda for the ammonia in the proportion of about one to five of soda.

R. S. (Ipswich).—*Measure Pipettes.* Provide a series of 1, 2, 5, and 10 c.c. pipettes; above this measure the graduated cylinders are better, say 50, 100, and 500 c.c. These, with a set of gramme weights, should meet all your requirements, or you might add to them a litre flask.

J. P.—*Storage of Rain Water.* There is nothing better than a well-cleaused petroleum cask or ruu puncheon; and if you can, by being always on the spot, allow the first washings from the roof to run to waste, and then collect only the pure rain water, you will be spared much trouble in filtering; but smuts so readily accumulate in towns that it will nearly always be necessary to filter the rain water before use.

W. T.—*Reducing Silver-Chloride.* Put in a few slips of zinc, and allow to remain for some days; then withdraw the excess of zinc, wash well by decantation, and lastly on a filter. Finally, melt the reduced silver in a Cornish crucible with a little dry carbonate of soda and borax as flux.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1666.—*August* 8, 1890.

CONTENTS.

TOURIST PHOTOGRAPHERS AND THE CHANNEL PASSAGES.

PHOTOGRAPHIC periodical literature on both sides of the Atlantic teems with items showing that the hot weather and the "dead" season are now upon us, and that those camera bearers who can do so are fleeing to the seaside or to the mountains. Within the last four or five years, as proved by the official returns, the passenger traffic between England and the Continent has been increasing by leaps and bounds, so altogether this seems an opportune moment to deal with the subject of the more frequented Channel passages, their boats, harbours, and subjects worth photographing from the deck of the ship.

The first question which troubles the tourist more than he cares to own, is whether he will suffer the horrors of sea-sickness on his coming journey. Some misconception is prevalent about liability to sea-sickness; most persons think that they will suffer less from it by taking the short passage between Dover and Calais, or Folkestone and Boulogne, instead of a longer route. The short passages have shallow harbours, especially on the French side, hence their passenger boats are all small, and draw little water, so that in the short "chopping" seas which are common enough in the narrowest part of the Channel, passengers are sometimes well tossed about, and made seasick upon breezy sunshiny days, when the same journey would have been altogether pleasant had they been upon a deep-sea boat. In a short passage of about seventy minutes the trouble is soon over, but passengers often have to leave the ship when they can scarcely walk, and if they say that they will remain on board for a short time, may be told that they cannot, as the boat will soon move away from the quay. A method of cheating the sea of its prey, sometimes adopted by those who have plenty of leisure, especially ladies, is to stay a day or two, if necessary, at the port of embarkation until the sea is smooth, and then slip across.

Beginning with the Dover-Ostend route, the boats are rather small, for the reason already stated, and the actual passage occupies in fine weather a little over three hours. The boats carry the mails, and are the property of the Belgian Government; they were built in Belgium, and engined by the Cockerill Co.; the engines are of first class workmanship, and of great power as compared with the size of the boat, consequently the speed of the latter is high. John Cockerill, an Englishman, founded the great Belgian iron works in the past generation at Seraing, near Liege, but for a long time past they have been the property of a Belgian Company. On those days when the sea is smooth, the restaurant department of the Ostend boat is much patronised; cooking goes on on board, and the charges fixed by the Belgian authorities and displayed for the benefit of the passengers are particularly moderate. The stewards are all in the employment of an hotel keeper at Ostend, who contracts for the vending of refreshments on the boats; hence it is no use consulting these officials in the expectation of getting disinterested information about Ostend hotels. At the present time Ostend is full of Germans, and all the hotels are, practically speaking, full. This is due partly to the circumstance of the German Emperor having visited the town a few days ago, and partly to the fact that there is an excellent railway service between Ostend and Cologne, which draws off from the Rhine districts and places eastwards thereof, those who seek rest and relaxation at the sea side. At Ostend there is little worth photographing from the deck of the boat; tall and roomy houses, with a sandy beach in front, represent Ostend as seen from the sea; the country around is absolutely flat. On the Dover side, the return boat approaches the Admiralty Pier in such a direction that admirable views can be taken in suitable weather of Dover Castle and the cliffs whereon it stands, with sea and boats in the foreground. A lens of moderately long focus is necessary. The Ostend boat reduces its speed when so close to its destination, and this is in favour of the photographer, who, at the same time, sees Dover Castle before him from perhaps the most picturesque point of

view. In fine weather this route across the Channel is exceedingly pleasant; in bad weather it is doubtless the reverse, what with the three hours' passage and the size of the boats.

Turn we now to the Harwich-Antwerp line to the Continent, which has the advantage of deep water harbours on both sides of the Channel; consequently deep sea boats are put on the service. Sleeping bunks and cabins are provided for the passengers; the cabins are illuminated by the electric light, and have "goose-neck" ventilators to keep the air pure. In times past this route was not spoken of in London with over-much respect; but of late years much money and care have been expended to make the service one of the best, and it is drawing a large share of the Channel passage traffic. The boats leave Parkeston Quay a little before ten o'clock at night, and reach Antwerp between eight and ten next morning; the direction of the tide in the Scheldt influences the time of arrival. Passengers liable to sea-sickness have (1) the advantage of being on board a large sea-going ship, which does not toss about like a walnut shell; (2) the advantage of not being exposed to the full force of the Atlantic in bad weather, being sheltered therefrom by the mainland of England; (3) the advantage, if sick at all, of being in a comfortable bed; (4) the advantage of ending the voyage with several hours' smooth steaming up the River Scheldt, giving abundance of time for recovery from sea-sickness before landing.

The steamers on this route are all twin-screw boats, and the largest of them is the *Colchester*. Twin-screw boats will rotate upon their vertical axis when the screws are moved in opposite directions, so the ship can turn in small space in a river. The breaking of the screw shaft is one of the most serious accidents which can befall a steamer at sea; but, with a twin-screw ship, if one shaft be broken, the boat can go ahead by means of the other shaft and the other screw.

Great speed is obtainable with twin-screw ships; indeed, our first experience with one was at the trial trip, off the measured mile, of a twin-screw vessel built to carry four guns, and scandalously rumoured to have been constructed to run the American blockade. She was, however, never used for that purpose, but was bought by the Brazilian Government to chase river pirates, because of her speed and power of turning in narrow places. The small Margate passenger steamers go at a good speed, yet the twin-screw boat rapidly caught and passed them, to the astonishment of the Margate passengers, who crowded to the sides of their boats to watch the strange vessel steaming with such rapidity down the Thames.

The Harwich boats have a smoking cabin on deck, and this locality is always the most sociable one on board ship. The Ostend boats are not so provided, but inferior cigars can be obtained on board the latter at high prices.

At Harwich is nothing worth photographing from the deck of the ship, unless the shipping in the harbour should chance to present favourable opportunities. The ship enters the Scheldt near Flushing, but that town is too far off to be made a prominent object in a picture. The river then for miles winds through Holland; flat country and occasional windmills present themselves on each side, and photographs worth taking are not obtainable except upon a day when fine cloud scenery forms the chief feature of the outlook. Sometimes the vessels passed on the river might be curious enough in their build or appearance to be worth photographing. Antwerp itself, however, offers food for the camera; the boat passes at such a distance as to be suitable for taking the lace-like spire of the cathedral and the intervening houses, and the Harwich boat passes along the whole of this side of Antwerp before it comes to the landing quay for its passengers. Abundant work for the camera, as many London photographers know, can be found in Antwerp, the great city which Napoleon I. had the idea of making a rival port to London.

(To be continued.)

Literary Notices.

The Stereoscopic Annual, by W. L. Chadwick. *(John Heywood, London,* 1890.)

This is a little book of 45 pages, by Mr. Chadwick, who is well known for the practical attention he has given to stereoscopic photography. Modern dry-plate workers are not so well acquainted with this subject as their elder brethren; to the latter the book contains little that is new. It contains full instructions about taking the negatives, and the more difficult work of cutting and mounting the prints, and of making from the negatives transparencies upon glass.

The Photographic Instructor, edited by W. J. Lincoln Adams. *The Scovill Manufacturing Company, New York,* 1890.

This book of 215 pages is written chiefly for beginners in photography, but is a useful book of reference for others. It deals with every branch almost of in-door and out-door photography, and while some of the chapters are full of necessary details, others are rather too meagre. For instance, few negatives exist which cannot be made to yield better than ordinary results in the printing, by the employment of various devices, and the four or five pages devoted to the branches of the important subject of "artistic printing" might have been exceeded with advantage. The book has an appendix by Dr. Ehrmann, on the nature and use of the various chemicals employed in photography, and some of the chapters are written by men of good standing in American photographic circles. Those who have thus assisted the editor are Mr. Charles Wager Hull; Prof. Randall Spaulding, of the Montclair High School; Prof. Karl Klanser, of Farmington; Mr. John Carbutt, of Philadelphia; Mr. O. G. Mason, of Bellevue Hospital, New York; and Mr. Maurice N. Miller, of the University of the City of New York.

Mr. R. Robert sends a sample bottle of what he names "The New Lavender Developer." Its action is rapid and energetic, and the photographer is warned not to be startled if the image appears immediately, inasmuch as there is no danger of fog, even with the most sensitive plate. The development, indeed, must only be stopped when the image begins to appear at the back of the plate. The action of the developer, which is made up in concentrated solution, may be controlled simply by the addition of more or less water. Other advantages are that it keeps well, and does not stain the fingers.

THE PHOTOGRAPHIC ANNUALS.

If any enthusiast of our art should require to possess a complete library of photography, he will want a very large book-case in which to keep the various books devoted to the one subject, and perhaps it is not too much to prophesy that at the end of a few years more the case must be expanded into a room; for books on every detail of the art, from stereoscopes to flash-lights, are constantly being produced—we do not say written, for in truth many of these works are sad examples of book-*making* as opposed to book-*writing*, which is, indeed, a very different thing.

Forming a principal feature in a collection such as that adverted to, would be those annuals which, at the end of every year, are produced with such regularity both in this country and by our cousins across the water. For these annuals represent the Encyclopædia of Photography, so full are they with information upon every detail connected with it. They also furnish the most ready means by which anyone may follow the modern history of sun painting, for not only does each volume contain a summary of the year's doings, but every advance is dealt with in sufficient detail by different writers to give it its proper value.

Photographers are most generous, and will, as a rule, tell all about their modes of procedure to any one who will lend them a willing and sympathetic ear. They have no trade secrets. Turning over a few of the pages of some of these back volumes, we can readily find out how such and such a well-known worker develops his plates; how an equally well-known hand spots, mounts, or retouches; and how somebody else says about something which he has invented, "This is a little device of my own which has long since paid its expenses;" and so on *ad infinitum*. How refreshing is this candour when compared with the difficulties one often meets with in getting at the correct way of doing things which prevails in other fields of labour.

The photographic annual professes to be a general summary of what has been going on in photographic circles during the year in which it appears, and although a great deal of its subject matter has been already, in the nature of things, threshed out in the press, it appears therein in more permanent form. A few decades back, when periodical literature was kept within smaller limits than it is now, the man who took in a weekly paper used, at the end of the year, to bind it. But things are different now, and the greater proportion of such literature eventually finds its way to the butcher's or the butter shop. The world has grown too busy to treat ephemeral things in any but an ephemeral spirit, and when the paper is read, away it goes to the waste-paper basket. But with the annuals it is different. The volume is worth keeping, if only for the sake of the advertisement columns, which, indeed, form a valuable photographic directory to all traders connected with the art.

But apart from this purely business view of the matter, we find in the annuals many things which are not to be found anywhere else, for there are a number of good workers who contribute their annual mite to this publication as their sole literary effort. In doing this, they unburden themselves of something good, for it is sure to be the outcome of practical experience, and is therefore valuable.

The annual is perhaps seen at its best when some epoch-making advance is nearly ready for general acceptance, and when men are hesitating whether to take up the new thing, or to leave it alone. Take, for instance, that period—now about fifteen years back—when the gelatine process was being experimented with and being improved gradually by many amateur workers. Let the professionals remember these pioneers when they feel angered against the ubiquitous amateur. But the amateur of that day was very different to his modern successor. He had to depend upon his own handiwork for nearly everything he required, and, besides making his own dry plates, made his silver nitrate as a preliminary and necessary operation. In those days the annuals were replete with all kinds of little details having reference to the making of emulsion and the coating of plates. Failures were common enough, a great many being due to the ignorance which prevailed as to the extreme sensitiveness of silver bromide under its new treatment. So much was this the case, that it was recommended by the pioneer dealer in dry plates that each plate should be washed in a preliminary bath of soluble bromide before development. It seems a laughable proceeding that the sensitiveness of a film should be purposely checked in this manner, but so it was in the early days of gelatine. In the meantime, professional photographers stuck religiously to collodion, and shook their heads incredulously when they were told of the merits of gelatine. They regarded it as a plaything only fit for amateurs, and not intended for serious work. And, in one sense, they were right, for a method must be out of its experimental swaddling clothes before it is of any use for really practical work. It is both amusing and instructive—to use the showman's formula—to look back through these annual volumes, and to see how these things have happened. We find in them the record of many an innovation which has soared upward rocket-fashion, and has come down speedily like the stick of the same noisy firework. We also find notice of the birth of improvements which have been announced in quieter fashion, but which are alive to-day. The photographic annuals are, in a word, necessary to the complete education of a modern photographer.

A "PHOTOGRAPHIC NEWS" SUPPLEMENT.

Next week we shall publish a pictorial supplement, representing the house at Eversley of the late Charles Kingsley, and executed by the photogravure process.

Ruby Light.—Ruby light, in spite of all that has been said in favour of the orange-green, continues to hold its own in the dark-room, and many who employ it continue to complain of its effect on their eyes. The remedy, says the *Beacon*, is the introduction of a pane of ground glass between the eyes and the ruby—*i.e.*, on the outside of the lantern.

THE PROGRESS OF THE PHOTO-MECHANICAL PRINTING PROCESSES.

BY HERMANN E. GUNTHER.

No. IV.

Collotype.—In consequence of the high perfection to which the photogravure process has attained of late, collotype seems to have been limited to a certain degree as regards book illustration. In this country (Germany) at least, photogravure is at present almost exclusively employed by the eminent publishers for the illustration of their splendid works, after "collotype, zincography and carbon printing have survived themselves," as one of them has quite recently declared; notwithstanding, our collotype establishments are fully engaged, there being so many other purposes—artistic and industrial—for which collotype is indispensable.

Great care has been devoted by the manufacturers to the perfection of the required machinery. The collotype steam presses are generally manufactured in three to four sizes, they being so constructed that the printing plate may be inked once, twice, or three times, each inking giving more vigour, though a corresponding decrease in the number of prints yielded.

The preparation of the plate for the steam press is generally identical with its preparation for the hand-press, but it will perhaps be of interest to note a formula for the preparation of the plates being adopted by a renowned collotype establishment, in which steam presses solely are in use. The substratum with which the plates are coated previous to the prepartion consists of 7 parts of stale beer, and 1 part of silicate of potash. The solution is filtered, and the plates are coated with it. After drying, they are placed for about half-an-hour in a warm, drying oven, when they are allowed to cool, and washed. The sensitizing solution is prepared of 25 parts of collotype gelatine, 300 parts of water, 7 parts of bichromate of potash, and chrome alum as required (4 to 20 drops of a saturated solution). The etching solution is the following:—50 parts of thick gelatine, 70 parts of water, 30 parts of ammonia (without the addition of hygroscopical salts). In order to keep the edges clean, to 50 c.c. of this etching solution a few small pieces of caustic potash are added, which solution is transferred to the edges of the printing plate.

With respect to the same subject, Mr. August Albert gives the following information. After the plate has been exposed in the printing-frame as much as required, it is fixed to the bed of the machine, but it is damped only as long as it is absolutely necessary with regard to the picture. Owing to the somewhat short damping process, a light tone will make its appearance in the "fond" of the picture; this may be afterwards removed in the following way:—Of a saturated solution of caustic soda 5 to 10 drops are, by means of a dropping-tube, added to 100 c.c. of the damping fluid in use; mix well, and cover with it, by means of a stout brush, and exactly following the outlines of the picture, the whole ground; allow to stand for a few minutes, and then take off the etching fluid carefully by means of a piece of blotting-paper. Care should, however, be taken that the fluid does not come in contact with the image itself, which in printing would at once become perceptible by lighter portions. The treatment of the printing plate with this strong etching fluid depends much on the kind of gelatine used, hard samples being much more resistant than soft ones, and it is therefore necessary to work very carefully, until the proportion of the addition of the caustic soda—the most favourable to the gelatine in use—and also the duration of the action of the etching fluid, have been exactly ascertained; otherwise the gelatine will be destroyed.

The preliminary coating process of the plate, though it seems to be very simple, is, notwithstanding, one of the more difficult processes in collotype. The old method with albumen and bichromate, though it is undoubtedly the most reliable one, is at present but sparingly used by German practitioners, on account of its inconvenience. The other method, with silicate of soda and albumen, is almost universally adopted; it is more easy than the former one, though in the case of limited experience it fails sometimes. After some experience it is not very difficult to see during coating the glass with the substratum if the preliminary coating is good or not. After it has dried up, there should be hardly anything noticeable in the glass, and after warming in the drying-box up to a temperature of 104° to 122° F., it should look quite even, like a very transparent opal glass, without being denser on one side; and after rinsing the plate in water and drying again, it should show the colours of the rainbow.

In one of our most eminent collotype establishments, an original and very efficient method of re-exposing the negative film is in practical use. Collodion plates are employed in this establishment for reproduction purposes, and in cases where a drawing or any other original in half-tones is to be reproduced for collotype, the collodion negative, after developing and well washing, is dried spontaneously. After drying, the negative is placed, film side down, on a piece of black velvet, and for about half an hour exposed to the action of strong but diffused light; only then is the negative fixed. This re-exposure is of importance, inasmuch as more softness and harmony in the tones are obtained by it. It would be interesting to try whether this method is also applicable in the case of gelatine plates; since, however, the gelatine film washes out with more difficulty than the collodion film, it would be well in this case to wash the gelatine negative for a comparatively long time after development, to remove every trace of the developing solution.

Hyposulphite of Soda, as a good febrifuge, has been mentioned; its antiseptic powers are not, however, very great. Cultures of chicken cholera do not lose their pathogenic properties by being kept for forty-eight hours in a 2½ to 5 per cent. solution of this salt, according to M. Perroncito.—*The Monthly Magazine.*

A Photographic "Every-Day Book."—*Scraps* says: "In no occupation, perhaps, does the Every-Day Book prove more serviceable than in photography. There is such a wealth of journalistic literature on the subject, that the average reader is apt to rise from his weekly study of it somewhat dazed with the quantity of matter, and consequently he is little able to carry away with him any of the details for future use. He has a vague idea that such and such a method is useful for such a purpose; but as nicety of working is necessary in our art, this imperfect recollection is useless. Let him then have always at hand his note-book to paste cuttings, or to copy into all such items as he cannot obtain cuttings of. Let him have an index carefully filled up from day to day, and if he can, let each extract be marked, "tried and found good—or bad," as the case may be. Such a book, looked over at leisure, will prove a source of infinite delight, and often recall some forgotten hint, and above all, will be a means of ready reference for some bit of information the details of which have slipped the memory." This advice of *Scraps* may be all very well in some cases, but scarcely applies to this journal, which is not usually cut up by its readers, but kept for binding.

PHOTOGRAPHY IN FLORENCE.

The *Bulletin* of the Italian Photographic Society for June has for its frontispiece an interesting phototype by the brothers Alinari from a negative by D. G. Roster of an enlargement of a diatom, Coseinodiscus oculus Iridis, &c., with a representative fraction of $\frac{1}{3000}$ diameter. The negative was obtained by Zeiss' photomierographic apparatus.

The letterpress opens with an account of the inauguration of the Society's place of residence on the 15th of June, on which occasion the president of the Society congratulated his fellow-workers on the great progress lately made in photographic knowledge, in art, science, and industry. Signor Cataldi then spoke on the process of photo-zincography, of which he gave a detailed and clear explanation; and Signor Golfarelli on the strict relation between the intensity of light, the aperture of the diaphragms, and the duration of the luminous action.

A new Italian photographic periodical is announced in the *Bulletin*. It is to have a "special physiognomy, and to respond harmonically to the tendencies of a distinct class," says the *Bulletin*, which adds, that as every day photography is making proselytes, and that there is a penury of Italian journals upon this subject, the foundation of a new periodical at a low price, which may circulate largely among professionals and amateurs, is a thing much to be desired. Signor Gioppi, the well-known photographic artist, will edit this new journal, which he has modestly named *The Photographic Dilettante*.

His Excellency Signor C. de Bildt, the Minister Plenipotentiary of Sweden and Norway at the Italian Court, a distinguished amateur photographer, and famous for his anxiety to obtain the latest news and discoveries in this branch of science, visited last month the President and Vice-President of the Italian Photographic Society, and had a long interview with them. He was much interested with the beautiful effects obtained by the stereoscopic apparatus of Professor Roster, and ordered one to be made for himself, proposing to employ it largely in his own country.

As a remedy against halation, or "aureole" as the Italians call this defect in negatives, the *Bulletin* proposes (1) the rubbing of the solarized portion with a tuft of wadding soaked in alcohol; (2) the covering the reverse of the plate with a solution of dextrine incorporated with black smoke and applied with a brush—this coating must be removed with great care before developing the negative; (3) the covering the back of the plate with a mixture of black smoke and cloves or cinnamon, taking care to clean the plate before development; (4) the gluing of a piece of dark flannel on the back of the plate, and detaching it before development; (5) the laying on of a light coat of burnt sienna or umber formed into a paste with gum. Other modes suggested are a sulphate of quinine in collodion, and the best results are promised from an application of collodion containing aurantia or chrisoidine. The backs of the plates may also be lightly coated with emery powder.

To prevent the separation of the gelatine from the glass plates in the hot weather of the present time, a simple recipe is given by Signor Vogel, consisting in immersing for a short time (say a couple of minutes) the plates, directly after development, in a solution of:—

Water...	500 grammes
Sulphite of soda	10 ,,
Tannin	1 gramme
Chlorhydric acid	5 grammes

This washing of the negative after development is only effectual when the tendency to separation is but slight. It can be also applied to the aristotype paper, but in this case it must be applied after the fixing of the image. The solution may be kept a long while without deterioration, and requires no special care, as, says Signor Golfarelli, "I myself am able to bear witness."

THE RECENT CITY PHOTOGRAPHIC EXHIBITION.

Last Monday we received a letter which had previously gone astray for some days through misdirection, from a correspondent, who gives the following particulars about the late Photographic Exhibition at the Drapers' Hall, London:—

The balance of £2 12s. 5d. was unanimously voted to the Photographers' Benevolent Association, it being a sum too small to be divided among the exhibitors who had paid for space; such a division would not have amounte d to more than twopence in the pound.

Having the magnificent rooms of the Drapers' Hall t the service of the Section, it was necessary to put the Exhibition handsomely before the public for the credit of the Section, and to do justice to the Drapers' Company. The preliminary expenses—printing, stationery, postage, and the services of an Assistant-Secretary—came to about £88. For the *soirée* the cloisters, which surround the inner square, had to be curtained in and ornamented; a cloak room, to accommodate 1,000 coats and hats had to be provided; also some first-class music and refreshments in corresponding style. The total expenses under this head amounted to £104. To provide handsome screens for mounting the pictures, a representative to superintend and direct the hanging, with advertisements in daily papers, &c., totalled to a little over £140.

The Photographic Section unanimously adopted the report and passed the accounts. A vote of thanks was passed to the Drapers' Company, to their Beadle, and to other servants for the great courtesy with which they received the Section and assisted in promoting the success of the Exhibition.

One Man Exhibition.—The exhibition of photographs by Colonel R. W. Stewart, which was promised, is now on at the Club. It is not only a "one-man" show, but also a "one-theme," the whole of the series, about sixty, being devoted to Westminster Abbey, almost entirely interiors. The prints are on matt-surface silver paper, and are of great interest, forming a very complete set, which all given to interior work will examine with much pleasure.—*Camera Club Journal.*

Artistic Photography.—Photography is, we think, now freely admitted to have much claim to the title of an art, and one special phase in studio work with the camera, where art comes into play, is in draping. The late Mr. Baden Pritchard has well pointed out that photography is more comparable with sculpture than with painting. Sculpture and our art are alike in absence of colour, and therefore light and shade and draping are the points which users of chisel and lens both have to study. Draperies not too light, not too dark, and not too stiff. Too soft and clinging they can scarcely be. Too old they cannot be. Soft greys, creams, and light browns for colours; and cashmeres, fine woollens, and soft muslins for materials. Taboo starch and glaze if you would hope for soft artistic pictures. Of course these are only aids to our artistic work; without them we can do nothing, with them we can do nothing unless we have eyes to appreciate and devise graceful poses and harmonious lighting.—*Scraps.*

GROUP DRAWBACKS.

BY MOSES BACK.

Burnet, in his *Essays*, often uses the term "group" in a technical sense, making it refer not only to groupings of persons, but to landscapes and even single portraits; thus conveying the idea that a picture is only a harmonious grouping of lights and shadows of various values.

In this sense a grouping of persons is no different from any other picture, and this is a point commonly overlooked by photographers; for while the good photographer will pose and light a single figure so as to give breadth and repose, few of the groupings so far exhibited have been anything more than meaningless conglomerations of spots, making the action uninteresting, because the means (light and shade) of expressing it was inharmonious; the group must be treated as a unit, and the light and shade grouped accordingly.

At this point, I think, is where photography meets its greatest obstacle. The artist cannot always get the individuals in his group to dress harmoniously; and even if that obstacle is overcome, a suitable background is not always available. Most of the backgrounds offered for sale are utterly unsuitable for anything. Not to mention windows on the shadow side of the group, and general daubiness of effect, most of them are arranged so as to bring the light side of the group against a dark ground, and *vice versa*, which is highly conducive of that spotty effect so justly denounced by Mr. Wilson. Therefore a carefully selected background is one of the first essentials in getting up a group. The difficulty of harmonising backgrounds and figures is appalling; but, as genius is only the ability to take infinite pains, I look for vast improvements in the facilities in this direction. Perhaps some one will invent a system of painting backgrounds whereby the operator can, with a brush and ready-prepared paint, modify the ground in its broad tints so as to suit the material in hand, and leave the general design more or less intact, and be able to go right on and use the ground at once.

As to composition, I think the fundamental principle of that branch is never to have any object in the picture chargeable with vagrancy—*i.e.*, without visible means of support or compensation.

The artistic eye is the eye which perceives the *harmony* of things. I just wish to call attention to the harmony—one might almost say unity—of pleasing effects of chiaroscuro and graceful action. As pleasing chiaroscuro has its focal point, so has the action in any incident its central point; and when these two coincide, and the accessories, both in action and values, are harmoniously grouped, we have a picture which is "attractive to our moral nature in its purity and perfection"—which is Ruskin's idea of a beautiful thing.*

As to how—pains, infinite pains. "For every one that asketh receiveth, and he that seeketh findeth, and to him that knocketh it shall be opened."

I fancy the best way is to portray what you see suggested. A man whose eyes are open, on the street or at home, will be constantly seeing new and interesting groupings and actions which are worthy of reproduction by the camera. Not that he can carry around a shot-gun camera and pull the trigger every time he sees something interesting; but in seeing an interesting group he shall set his inventive faculties to work, and bringing the composing elements together at the favourable time shall, with mature study, produce an unstudied effect.

As for portrait groups, as our lenses are now made, I don't see how one can avoid taking the licence of having most of the individuals looking at something not visible in the picture, as a group of profiles or people without eyes (looking down) is to my mind stupid.—*Wilson's Photographic Magazine.*

* Modern Painters, vol. i. p. 93.

PHOTOGRAPHY IN GERMANY.

BY DR. H. W. VOGEL.

Photography in Natural Colours Again—Red Glass for Dark Rooms—Ready-Mixed Developers—How much Gold and Silver is used in the Printing Process—Recovering Gold from the Sulphocyanide Gold Bath.

Veresz' photographs in natural colours are still the daily talk. In regard to their durability I have given already my opinion. But one question seems to me still more important, that is, the resemblance of the colours to nature. Having been previously without the originals, I was not enabled to give a decision.

In the meantime I have obtained from the inventor Veresz a new photographic picture with the original, and I am now in the position to give a positive criticism about the natural resemblance of the colours. This refers only to the picture on paper which at present is before me.

The original is one of those transparent window-pictures in bright colours, brought into market by Grimme and Hempel, in Leipsic, as a substitute for glass painting. It represents a Cupid with yellowish brown hair and wings, and a small blue scarf around the waist, whose ends wave in the wind. He carries an arrow piercing two hearts of ruby colour; between the knees he holds a quiver with yellow ornamented opening, and in his left hand the upper part of a large brown cross-bow, with blue and yellow mountings, the lower part of which rests, with the figure, upon an idealistic thistle blossom of red leaves. The stem is of the same colour, and the plant shows fresh green leaves. The picture has a pale-blue background, and red, green, and yellow ornamentation around the border in very pronounced colours.

This border ornamentation affords an excellent means of comparison with the print. The latter, in opposition to the bright original, shows a greenish-grey, partly dark ground. At first look, one recognizes readily that of all the colours only the red of the original has been distinctly reproduced. But it is not true to nature; it has a copper-red colour, and differs decidedly from the vermilion and carmine red of the original. Besides this copper-red only the blue of the scarf and the mountings of the cross-bow and quiver come out as a very pale light blue, with no natural resemblance: the black lines of the border decoration appear alongside of this as a violet black. These are the tones which, to some extent, have a similarity of colour, but with the other colours it is not so favourable. The yellow squares and green trapezoids of the border decoration appear neither yellow nor green, but have a greyish-red tone. The blue fields are not blue, but greenish-grey like the ground.

It is most singular that several parts are reproduced in red—which actually are not red, but brown-yellow—as, for instance, the hair, the wings, the cross-bow, and the thistle. The green leaves in the print show no fresh colour, and

the red leaves of the blossom and the body of the Cupid show only a pale flesh-colour.

It is also remarkable that the thin lines of the shadows (black in the original) appear red in the print, even in those parts not coloured red; while the broad black lines, as remarked above, are black.

The resemblance of the new photographic pictures to natural colours is therefore not very favourable. Only two colours can be recognized distinctly in the copy, of which the red is the best, in a less degree the blue, which is weaker as far as the picture is concerned. The blue in the ornamentation around the border and all other colours either have not been reproduced at all, or are entirely unlike the original. It is possible that these discrepancies did not appear so prominently in the previously-described glass pictures, whose colours were decidedly more lively. I have no proper data at present to make a comparison to decide this question.

If I compare the sample before me with the pictures I have seen in 1867 of Niepce de St. Victor, Becquerel, and Dr. Zenker, I must confess that those much older productions were richer in colour, although the tones deviated likewise considerably from the natural ones. An essential progress I can therefore not recognize in the present pictures. But after all it is good to revive the problem, and thus animate to further experiments.

If other scientists, like Dr. Eder and Eugen von Gothard, express themselves more favourably about Veresz' photographic pictures, the reason may be that they have not seen the older productions, which I have.

Recently repeated complaints have been made about the coloured glass for dark-room lamps and windows, which are not without reason. Every dark-room glass should keep back that light which acts strongest upon the plate. This is particularly the blue light for ordinary plates, and the green and green-yellow for colour-sensitive plates. This is avoided most completely by a suitable glass of red, copper-flashed. It must not be too thin, of course. We have seen red glass lately which was so thin that a considerable part of green light could pass through. By looking through the spectroscope this defect could at once be detected, and I made the remark some time ago, that all glasses which we use for the dark room window should be tested spectroscopically. This can be done easily by anybody.

It has been proven that screens cut from the same sheet are not always alike. Some of them are correct, others are too thin again. To overcome this defect once and for all, and to furnish all buyers the certainty that they get good glasses, behind which the plates will not fog, the dealers should sell only glass which has been tested. Even if it is a little more expensive, the loss caused by bad and fogged plates is much higher.

At the Royal Technical High School we apply a pocket spectroscope, which can be had at the moderate price of 36 m. from Schmidt and Hoensch, opticians, in Berlin. This is focussed by drawing it out until the celebrated Fraunhofer lines can be recognized distinctly. Placing the red glass to be tested in front of the same, it should admit only red light; all other light should be absorbed. The only correct glass is copper oxide flashed glass. The red gold glass, which resembles the other very much, is not suitable—it transmits a considerable quantity of blue light.

Now, if the glasses of a weak red or gold red are a bad thing, the glass combinations of green and yellow should be discarded entirely. Besides the green they will transmit even greenish blue, and cannot be used even for ordinary plates. The combination of green and yellow is just as objectionable, as it will darken the laboratory in an extraordinary manner.

With an actually good red glass, ordinary and even colour-sensitive eosin silver plates can be developed. Only for red sensitive azalin plates it should be recommended to subdue the light somewhat in the beginning of development, and to keep the plate as much as possible in the shadow.

For several years ready-mixed developer, which is also sold by the dealers, has been in general use. This has also been done at the Royal High School. Lately it has been demonstrated that old developer, even if not used previously, will easily give silver glossy fogs, and this is particularly the case with the hydroquinone developer. This fog is also obtained if by accident some fixing soda should come into the developer. It can be wiped off with the fingers, but it is always disturbing. Eikonogen developer is always kept in separated solutions, as is well known. We do the same with the hydroquinone developer—that is, we keep the alkali (carbonate of soda) and the hydroquinone by themselves, and mix them shortly before use. After use, we keep the developer three to four days, and prefer to apply it for over-exposed plates.

About the consumption of gold and silver in the positive process, we had lately an interesting discussion in the *Verein zur Förderung der Photographie.*

The chairman reports, according to tests made by him and the experiments published in his text book, that if the silver bath has been freshly made, 2·6 grams will be used per sheet, but that by a continued strengthening of the bath the consumption will decrease to 2 grams. This, of course, was at a time when the paper was strongly salted. At present, when the quantity of the salt amounts to only 1 per cent., 1·2 gram of silver is consumed per sheet.

Mr. Haberlandt reports that in former years he used less silver, but that at present, in consequence of the many complaints made, the paper is again more salted, in consequence of which the consumption of silver per sheet would come to 2 grams. Mr. Bouck uses on an average 1·25 gram per sheet.

Mr. Haberlandt remarks that thinner baths, weakened by use, will make the paper fibrous. Mr. Vogel, Jnr., ascribes this to the circumstance that the albumen is not sufficiently coagulated by a weak solution of nitrate of silver.

About the consumption of gold, the chairman reports that 3 c.c. gold solution (1 : 50) are used per sheet at the High School.

Mr. Haberlandt dissolves 5 grams chloride of gold in 700 of water, and uses 4 to 5 c.c. of this solution per sheet.

Mr. Bouck used 20 grams chloride of gold per ream; therefore, per sheet about $\frac{1}{25}$ grm.—that is, two-thirds as much as at the High School.

Another subject of discussion was the precipitation of gold from old sulpho-cyanide gold baths. Sulphate of iron is not suitable.

The magnesium powder proposed by Mr. Haberlandt for this purpose would not work, but oxalate developer precipitated the gold to a great extent by heating.—*Anthony's Photographic Bulletin.*

TRUTH IN PHOTOGRAPHY.

BY H. COLEBROOKE.

There is a saying that "The noblest study of mankind is man." This seems to be one of those generally accepted truisms which needs no argument to convince anyone of its truth; and this truth, I think, should be still more patent to photographers, whose work is to reproduce in the form of photographs this noblest study, with all its characteristics and various aspects.

Many writers of the present day seem to resent as cant the necessity for absolute truth in a photograph, looking upon it as generally inconsistent with the necessary pleasing qualities. The author of "Modern Painters" says: "Some art is meant to teach and not to please," but of course this cannot be said to apply to photography, or rather, cannot be reconciled to business; but the same author says also, "Inferior art omits or changes all that is ugly," and this is the rock on which these writers split; one side insisting on truth in all its ugliness, the other insisting on the removal of the ugliness.

I think it should be necessary, before deciding such a point, for a man to prove to himself that he knows what ugliness means, and of what it consists. Let him look upon mankind as a book open to him to study—a study so free from monotony that it must be pleasing to all, and yet wider and deeper than all other studies. Let him realise that all men are not alike; that each and everyone has within him a something differing from others, this something being the very germ of the man, without which he becomes a nonentity. No two men see alike in all points, for they see with different eyes; no two men think alike in all points, for they think with different brains; and in all points where this difference is manifested this something is manifested also, and this something has a name that many use, yet of which few realise fully the meaning—individuality.

It is obvious, then, that if we want to *know* a man we must use comparison, not looking for those points familiar to us in other men—which we naturally do—but for those points wherein he differs from *all* men. I do not pretend that there is a possibility of any man mastering such a study; on the contrary, I should say that few get to any depth, and that the position of the deepest is as a shallow lake compared with an unfathomable ocean. Yet let the knowledge gained be never so small, it is priceless to the photographer. It teaches him to grasp somewhat the meaning of a face; ugliness becomes something more than the mere opposite of beauty; beauty contains more than colour, outline, or expression; truth means more than the harsh outline of ugliness; while every line and feature breathes out something that proclaims *the* man as distinctive from *a* man. The deeper into this subject the photographer goes, the wider and more acute becomes his vision, until at last it dawns upon him that truth is not incompatible with beauty. Each detail of a face becomes of significant value, and, naturally, the more the value increases, the less anxious is he to part with it; but, at the same time, as his knowledge increases, these details resolve themselves into positions of more or less importance, which he carefully enforces or reduces according to their degree of importance.

It is decidedly useful for a photographer to have a knowledge of the bones and muscles of the human frame, but it is decidedly not useful for him to possess a diagram, either literally or mentally, by which to correct all mistakes Nature has made according to that diagram. Human nature is contradictory, and refuses to be reduced to a table or chart (and herein lies the fallacy of attributing, *absolutely*, to certain shaped heads and faces qualities differing with that shape). The student must invest each anatomy with individual life, and seek a purpose and significance in those very points his diagram proves to be incorrect. Let it be understood I do not speak of malformation or disfigurement; these, it is true, possess a decided significance—so does a black eye—but a significance not necessary to individuality, or the reproduction of individuality in a photograph. This statement, however, requires a little qualification. Because a man is deformed, it need not be essential to enforce that deformity in a photograph; but to untwist a twisted neck, to balance a one-sided face, or to straighten a crooked nose, is to produce an absurdity, because it does not exist. Let the photographer conceal what he pleases, for that is part of his art, but let it be truly and only concealment. Take, for example, a person one side of whose face is deformed, By turning the deformed side away from the camera it does not appear in the photograph; yet it still exists. Such means are legitimate, because it is not altering nature, but showing her best side; in other words, not destroying, but concealing ugliness. To cut and pare a man according to a model is to prove one of two things—either a conviction that all men should be alike, or that the photographer is working against conviction—that is, doing what he knows to be wrong; and a man working against conviction is a half-hearted creature at best.

To begin at the beginning, the human race represents a whole which is split up into many parts; first, say, nations, each of which possesses some characteristic points that distinguish them from the others. These in turn are divided, sub-divided, and divided again into degrees, orders, classes, and families, each claiming some distinguishing mark, until we reach the individual. A comparison might be made to a peal of bells of such number as to allow an incalculable number of combinations and changes; the whole human race being represented by the peal, the many types by the groups of combinations, and the individual by the incalculable changes. Now, it follows that as the brain of man cannot receive anything incalculable, he may grasp an idea of the many types or groups of humanity, yet certainly not the faintest of individual humanity.

Dickens is said to have drawn all his characters from life, and the chief fascination these characters possess is, I think, that, apart from the actual story they tell, they present types of humanity that all are more or less familiar with, and therefore are accepted by all as a reality. A photographer has to present an individual, and therefore has less to do with type—which will manifest itself to a certain extent—than individuality. He must, therefore, free himself from all classification, and deal solely and only with the individual before him as apart from the whole race. If he can do this he can realise that absolute truth is essential, and will characterise as balderdash any attempt to prove otherwise.

The face is naturally the chief study. The figure, of course, possesses many important points, more in action, less in repose; but in either, the photographer has less scope. There is much in a movement or gesture, but until instantaneous photography becomes practicable in more senses than one in the studio, the portrayal of such is impossible. The face has been called the index to the mind, and what greater study can there be than this? Let the photographer study outline and form, and classify them if he will, but there is a subtle something shown by this index that defies classification and beggars description, breathed out by and impregnating every line and feature. What stronger argument can there be for absolute truth?

Let those who would excel, study their fellow-men, and strive to fathom their minds and thoughts. Let them seek bad qualities or good qualities, it matters little—one will manifest the other. Let them only desire to reproduce what they see and understand, and, though much of this be impossible, the result will certainly elevate all that it is in their power to reproduce.

What is a beautiful landscape to an uneducated eye, and what would a picture of that landscape be produced by the owner of that eye. So it is with a face. A man is dead to outward beauty until he receives sight, and even then he requires education before he reaches a full appreciation of what he sees.

In conclusion, I quote from a comic paper—there is many a true word spoken in jest—the following lines, as an instance of a good deal of sense contained in a very small space: "To know others, study thyself; to know thyself, study others."

London and Provincial Photographic Association.—Subject, August 14th, further adjourned discussion (third evening) on "Printing under Coloured Media."

THE METRIC SYSTEM IN PHOTOGRAPHY.

BY W. H. SEAMAN, M.D.

A priori the units of the metric system are just as easy to form thought elements as those of the other, and, when formed, the translation required is from the English units to the metric for comprehension, and not *vice versa* as assumed. This is the case with most of our German friends, who form no small part of our scientific population. But, farther, the metric system is used by the whole civilized world, except English speakers, and among the latter is used by all chemists. It is actually in universal use by chemists throughout the world. This is a good reason why all arts dependent on chemistry should use it, such as photography, medicine, and pharmacy; and it modifies the personal equation, because most English chemists think in grammes. In my own case, I always translate the English units, not the metric. I know many chemists and physicians who do likewise.

It may to some look like an extravagant statement, but it is simple truth, without exaggeration, that the English system is a relic of barbarism which impedes general education.

It has been calculated by teachers, published by the Metric Bureau, and never traversed in the writer's knowledge, that the substitution of the metric for the ordinary system would save a year of the school-life of every child. What labour-saving machine ever invented is equal to this? There are about fifty factors to be memorized in our system. In the metric but one; and this is the same as our ratio of notation. Hence, as a practical matter of education, the whole time spent in learning by heart tables of weights and measures is wasted.

In a piece of work now in progress here, in which a comparison of many analyses is required, in which the results have been mostly published in some form of the old system, because of supposed public utility, it will cost hundreds, if not thousands, of dollars to bring them into a common form adapted for mutual comparison with each other. Precisely the same confusion exists in photographic formulæ, as the writer well knows from a late attempt to compare a number. Mr. Wallace's article cites the unity of minim and grain as an advantage, but it is the sole instance of correlation between weight and measure in the old system, while every measure and weight corresponds in the metric. Why use a bad thing when a good one is at hand?

I think very few chemists, at least of the younger class, would accept the statement of "uncertainty in rapid calculation." On the contrary, it is the metric system that would be preferred, because of the greater rapidity and certainty of calculation.

Definite ideas of weights and measures come by actual use, and not by thinking about them. And if the use is begun early in life, the idea is formed more easily and perfectly than when commenced later.

Our professional schools are responsible for the continued toleration of the "American" system. At the present time nothing but the metric system should be taught in such schools, and every druggist should be required to possess a set of metric weights.

This would not interfere with the practice of those too old to change. The old system is well called the American system. No other nation uses it. The Imperial pound and gallon are the officinal measures of England, and the pound troy is no longer in English text-books, while the Winchester or American gallon disappeared long ago. When we use imported measures or graduates, they are not the same as ours.

A small part of the metric system suffices for the photographer. The following table represents a form the writer has found well adapted for professional students:—

1,000 millegrammes make one gramme.
1,000 grammes or cubic centimetres make a kilo or litre.
1,000 kilos make one ton.
65 millegrammes make one grain.
15½ grains make one gramme.
31 grammes make one ounce troy.

The last table is only because of our present transitional state. Millegrammes, grammes, and kilos are weights, and the metric ton is 2,204 pounds, between our long and short ton. Cubic centimetres (usually written c.c.) and litres are measures. The actual weight of any measure of liquid, if its spec. grav. is known, is got by multiplying the corresponding weight by the s.g.

In writing metric formulæ, the point should stand between the grammes and millegrammes. Three figures on the right of the decimal point are millegrammes, all on the the left grammes. In the arts the millegramme is never divided.

The present Pharmacopeia uses parts by weight. The Washington Camera Club prints its formulæ in parts per hundred, thus:—

Hydroquinone ... ... 2·25 per cent.
(In metric terms it would be 22·500.)
Sodium sulphite, C.P. ... ... 10 per cent.
(In metric terms it would be 100·000.)
Distilled water ... ... 87·75 per cent.
Make up to one litre.

POTASH SOLUTION.

Potassium carbonate, C.P. ... ... 15 per cent.
(In metric terms it would be 150·000.)
Sodium sulphite, C.P. ... ... 10 per cent.
(In metric terms it would be 100·000.)
Distilled water ... ... 75 per cent.
Make up to one litre.

For use dilute No. 1, half, add 3-6 drachms, or 10-20 c.c. potash.

The change from per cents. to grammes needs only a change of the decimal point. Hence no advocate of the metric system has any objection to a percentage system. Duplex graduates are for sale with c.c. on one side and fluid ounces on the other, and the c.c. are good for percentage. Chemists generally make up their formulæ on a basis of one litre, *i.e.*, 1,000 c.c., as a convenient quantity.

Another change that seems to be greatly needed in the mode of stating photographic formulæ is to give the strength actually used, and not that of the stock-bottle. Every man with brains enough to be a photographer at all, can make his stocks of a degree of concentration to suit his convenience, or the size of his bottles. What must be known is the strength of the solution actually applied. Much space would thus be saved in description, and different formulæ could be compared directly, which now require many figures. Thus the Washington formulæ as used is half the given formulæ. Or the water can be doubled.

I am pretty sure that anyone who will actually use the graduates and weights of the metric system in compounding solutions for a short time (not attempt to translate equivalents) will soon find them satisfactory.—*The American Journal of Photography.*

Notes.

Owing to American legislation and other influences in relation to silver, the price of nitrate of silver has been varying of late, and is now high as compared with prices of recent years. New sources of supply of the metal are coming to the fore, and if they increase may possibly have some little influence on the cost of nitrate of silver in the future. At the metallurgical and mineral exhibition now open at the Crystal Palace is a vast trophy, silvered outside, and reaching nearly to the roof of the building, representing the output of silver of the Broken Hill Proprietary Co., New South Wales, between May, 1886, and July, 1890, amounting to 16,500,000 ounces. The exhibitors are Messrs. Vivian, Younger, and Bond, of London, one of the principals of which firm we believe to be Mr. Vivian, the well-known copper smelter, of Swansea. Other firms also furnish particulars at the Crystal Palace about their output of silver in New South Wales. The Crystal Palace now looks more attractive, and has less the aspect of faded gentility than was the case some years ago, betokening in its improvement evidence of good management.

Mr. Ferrero is *par excellence* the business man of the Camera Club in matters financial, and displays ability in paying polite attention to those members whose subscriptions may be in arrear. An article from his pen will be found on another page about the new premises of the Camera Club in London, which are in such an advanced state that the girders of the fourth floor are now on the point of being laid. The Camera Club has thoroughly efficient officials, who put their hands well to the plough, and get all work done expeditiously. Mr. George Davison, for instance, is noted among London photographers as a model secretary.

In relation to the ever-smouldering subject of amateur *v.* professional photographers, there has been in this country a marked improvement in tone on both sides for some time past. It is evident, on the one hand, that because many utilize photography as a business is no valid reason for preventing others following it as a hobby; on the other hand, there is no desire on the part of the majority of amateurs to do harm to the professional photographer, but rather to put business in his way whenever possible. Some of the ill-feeling of the past was largely due to the vagaries of individuals of vulgar wealth, who think in their inexperience that money can do everything, until they find to their astonishment that it is no passport to the inner circles of refined society, so try to assert themselves by being as offensive as possible to those over whom they think they can exert any influence. All persons of this class would form good photographic subjects for Mr. Gambier Bolton, Mr. York, and other camera men interested in zoology. There is no more pitiable object in nature than an individual without mental resources or natural refinement, who has been left large sums of money instead of cultured education; such individuals of their own accord go straight to their father, the Devil. People of this class who give themselves airs, are rather more plentiful than is pleasant to those competent to estimate them at their true value.

Last week we spoke of the difficulty in working the old waxed-paper process in the tropics, as evidenced at the Hong Kong Observatory; yet this process has still merits of its own for certain classes of work in meteorological observatories. This week we have received a copy of the official report for 1884 of Mr. W. Doberck, the Government Astronomer at Hong Kong, who says therein: "Unfortunately a large stock of waxed paper had also been supplied by the Secretary to the Meteorological Office, who was not aware that argento-bromide paper had for years been successfully adopted in India. Now the necessity for iodising and sensitising every photographic sheet has caused a deal of trouble during the damp and hot season. The sensitised sheets were found not to keep for two days on the barrel. The sheets had then to be changed every day. Even the iodised sheets did not keep for any length of time. Only freshly iodised sheets could be sensitised with any degree of success, and this added enormously to the labour, a great part of the time of the second assistant being taken up in the work. Even when every precaution was taken, the result was not nearly so good as during the winter. Tannin as recommended by Chambers, was tried, but made no improvement here." At present, commercial argento-bromide paper is used in meteorological observatories.

The packing of dry plates for touring has occupied the attention of many photographers, both professional and amateur, and we have often received letters asking for guidance in this matter. We believe that the best plan to adopt is to allow the plates to remain in their original boxes until they are transferred to the dark slide or changing-box. After exposure, they may be numbered on the film side with an aniline pencil, so that they may be identified before development, and can then be packed film to film with nothing between them, in packets of four, and after being wrapped in red paper can be restored to the cardboard box from which they came. This box should also be wrapped in red paper, fastened up with some gummed postage stamp edging, and labelled with the name of the district in which the plates have been exposed. We have adopted this method for some years, and have never yet had a plate injured, either mechanically or chemically.

Many persons advocate the practice of placing a sheet of paper between each pair of plates, and although this looks plausible enough, and would be desirable in the case of ordinary plates of glass, we cannot approve of it for photographic plates. Common paper is known to be contaminated with substances injurious to the sensitive coating of the plate, but even if a pure paper

were attainable—as of course it might be by using that of which chemical filters are made—then comes in the question of unequal pressure on the film, which leaves a record which is revealed by development. Most photographers have had to learn this by sad experience, and know now that a slip of paper will leave its mark behind it.

There are some good people whom we have read about who absolutely refuse to travel by rail, so firmly are they tied to the traditions of their youth. In the same way, people are met with who refuse to acknowledge the march of modern events, and, in detriment to their own interests, will close their ears to remonstrance. We are led into this train of thought by a letter from a tourist at Deal, Kent—a place which has refused the modern call to "move on." Things go in a primitive way there, and the old town is much the same as it was fifty years ago. However, it has a railway and a pier, and it is about this latter structure that our tourist friend pours out the vials of his wrath. Armed with his peaceful camera and tripod, our friend presented himself at the gate, and the man at the wicket demanded of him the sum of half-a-guinea before that camera could be allowed to pass. Our friend expostulated, but to no purpose; the fatuous authorities had named that prohibitive sum against the entry of such a profane thing as a camera upon their sacred premises, and its bearer had to go away lamenting.

We sympathise with our correspondent, and console him by the information that there is really very little lost by his exclusion from Deal Pier. One or two steamers call there daily, but that is all. The rest of the shipping never get near enough to it to have their portraits taken. We advise him to betake himself and his camera to Lowestoft, where the single payment of one penny will give him the right to traverse the pier for a whole day, with a camera or without. There the sea is alive with picturesque fishing boats, and he will find enough indeed to interest him, and to make him forget the short-sighted policy of the wiseacres at Deal, which drives tourists away instead of attracting them to the town.

There is much virtue in flattery. The photographer who is adroit in paying compliments may expect a large business, other things being favourable. An experienced photographer of our acquaintance says that the first thing towards securing a good photograph is to make the sitters thoroughly pleased with themselves, and the next to make them forget all about themselves. It is hard to say which is the most difficult task. The photographer must be a combination of the courtier and philosopher. He must humour the vanities of his sitter, and be charitable towards them. That man was skilful who, when a particularly austere lady with an expression of iron asked him for how much he would take her, replied, with an engaging air of innocence, "About five and twenty, madam." She was five and thirty at the very least, and she remarked sharply, she did not mean that; but, nevertheless, the muscles of her face relaxed, and she was fairly amiable for at least half an hour.

The foregoing is an example of the sitter being pleased with herself. The proper time for gently inducing this feeling is of course previous to any preparations for taking the picture. Having got your sitter into a pleasant frame of mind, then comes the next operation, the bringing about of the forgetfulness of self. The time for this is when the eventful moment for making the exposure is approaching. Reserve your best story, your most sparkling epigram, your quaintest paradox for this crucial juncture. To carry this off successfully you want to be something of an actor, for there are times when, to use Jack Point's words, "you can't let yourself go;" but if you have successfully accomplished the first condition mentioned, the second will not be difficult. Sitters who are pleased with themselves are not likely to be very exacting.

The detective camera has placed a new pleasure and a new power literally in the hands of the tourist. We are told that a large party of American excursionists lately visited the Parliament House in Edinburgh. They were all heavily armed with hand-cameras, and one of the party, a young man, had the hardihood to take a "shot" at the Judges of the First Division, unknown, of course, to their lordships. We foresee in this the beginning of what may be called a photographic epidemic among American tourists. These energetic ladies and gentlemen are the most systematic and pertinacious of sight-seers. They are always in such a hurry, and are so anxious to "tick" off everything they have got down in their note-books, that they have no eye for the real beauty of scenery or architectural charm, and no time for enjoyment. They are only happy when the sight is "ticked" off. To these the camera will be indispensable. They will use their eyes less than ever. The tomb of Rubens at Antwerp, the Venus of Milo in the Louvre, the headsman's block in the Tower of London, and a hundred other notable things more or less celebrated, will all be "shot" at in haste, and developed at leisure. It is hard to say where the pleasure in this mode of enjoying oneself will come in.

In the opinion of some sensitive people the sale of Gibson's Tinted Venus to the enterprising soap firm for advertising purposes is a degradation of art. This is by no means so certain. The dissemination of copies of a beautiful statue or picture, though the object may be an advertisement, can do no harm. We may expect to hear of the Tinted Venus being photographed from every point of view, as was Focardi's "You Dirty Boy." The photographing of this popular statuette was not an easy undertaking, as to do justice to both the old woman and the boy involved great care and judgment in the lighting. Gibson's statue will be much less difficult.

WASHING PRINTS.

In putting into shape a few thoughts on print washing, I have before me, as a text, an observation of Andrew Pringle, at a recent meeting of one of the London, England, societies, to the effect that prints should be subjected to the action of the squeegee and plenty of elbow-grease, and then transferred to the washer.

It may be taken for granted that the object of washing is to remove all traces of, not hyposulphite of soda, which would do little or no harm, but of the double salt of soda and silver, which, on exposure to light, would certainly degrade the whites, and probably also the coloured silver substance of which the picture is composed, and the question is, how much washing is required for that purpose?

I do not suppose that anyone at the present day considers it necessary to soak the prints for twenty-four, or even twelve hours, as was at one time the almost universal custom, but I know that there are many who still adhere to a needless system of prolonged washing, and needless waste of, in some localities at least, valuable water, and the object of this article is to show such photographers that both time and water may be economized without danger to the prints.

I may say at the outset that the following statements are the outcome of a series of carefully conducted experiments, and may be relied on as being correct, so far as the "trained observer" is worthy of confidence, subject, of course, to the variations incident to all commercial articles.

A sheet of albumenised paper, coagulated by sensitising on the nitrate bath, will absorb half an ounce—four drachms—of water, and, therefore, when after toning and fixing it is drained and placed into the washing water, it carries with it, on the supposition that the strength of the fixing solution was one to eight, just thirty grains of hyposulphite of sodium and silver. If the prints—*i.e.*, the one sheet of paper—be covered with thirty ounces of water, and kept moving about for, say, five minutes, the thirty grains will, in consequence of the diffusion of liquids, be spread over the thirty ounces of water, and if the prints are removed and drained, they will retain only half a grain of the salt. The prints so drained and immersed in another thirty ounces of water, the second charge will, when diffusion is complete, be in a solution of only one-sixtieth of a grain to the ounce, and when lifted and drained, will carry into the third water only one-hundred-and-twentieth of a grain. Repeating the washing process in this way, it will be evident that by the third or fourth change of water, if the diffusion has been anything like uniform, the trace of silver hyposulphite that can remain is so small as to be unworthy of notice.

But theory and practice do not always go hand in hand, and in this case diffusion is sufficiently protracted to make a more than theoretical washing necessary, and the following experiments were undertaken with a view to ascertain just how much more. The sheet of paper, drained from the fixing bath, was placed in a tray, covered with four pints of water, and the prints kept in motion for five minutes. They were then removed and allowed to drain—the last drops being received in a test glass—and again immersed in another four pints of water. Two of the drops from the prints were found to discharge the feeble colour from a drachm of iodide of starch solution. The process was repeated, and this time at least twenty drops were required to discharge the colour. Of the third washing, more than equal parts of drippings had to be added to the test solution before a perceptible effect was produced, and of the fourth washing even three of the drainings to one of the iodide solution showed little more than the effect of dilution, while the fifth water had absolutely no action on the delicate test.

From those experiments, then, I think I am warranted in assuming that ordinary silver prints may be thoroughly washed in six changes of water, at the rate of, say, four pints to each sheet, each change, or twenty-four pints altogether, for each sheet. The changes may be made at intervals of five minutes, and the whole washing be completed in thirty minutes from the time of removal from the fixing bath. Of course that implies a constant movement of the prints during each of the five minutes' soakings, so as to promote, as far as possible, the diffusion of the solution in the washing water.

Those, of course, who can arrange for running water can do much better, and without much trouble. All that is required is to see that the prints are kept separate, and that the water enters at the top of the washer and escapes at the bottom. In such a water, with a flow from a quarter-inch pipe, fifteen minutes' washing will be found sufficient. —H. G. in *The Beacon*.

ENAMELLING.

BY F. TARNIQUET.

Use very clean plates and rather larger than the prints to be enamelled. Wipe them well, rub them with tale, and remove the excess with a soft brush passed lightly over the surface. In a dish, half-filled with ordinary water, immerse the photographs and allow them to soak. This being done, coat one of the talced plates with enamelling collodion in the ordinary way, agitate to cause the ether to evaporate, and when the film has set—that is to say, in a few seconds—steep this plate, the collodionized surface up, in a second dish containing pure water; now take one of the prints in the first dish and apply the printed side to the collodion, remove the plate from the dish, keeping the print in its place with the finger of the left hand, and remove the air-bubbles by lightly rubbing the back of the photograph with the forefinger of the right hand. Care has been taken beforehand to prepare some very pure starch paste passed through a cloth, and some thin cardboards, or simply thick paper the size of the plates used. The air-bubbles having completely disappeared, and the perfect adherence of the print ascertained, dry with bibulous paper, and spread over the prepared cardboard on paper a coating of the collodion by means of a flat brush. Apply this sheet on the print, pass the finger over it to obtain complete adherence, and give it twenty-four hours to dry. At the expiration of this time, cut with a penknife the cardboard or paper even with the print, and detach by one corner; if the plate has been well cleaned, the print will come off of itself. We get in this manner a very brilliant surface, and as solid as that obtained by the use of gelatine, which, as it is seen, is entirely done away with in this process. The prints are afterwards mounted on thick cardboard in the usual way. It is possible, by mixing with the collodion some methyl blue dissolved in alcohol (a few drops are sufficient), to obtain moonlight effects, especially if a rather strong negative has been used. For sunsets make use of an alcoholic solution of coccinine.—*Science en Famille*.

THE NEW PREMISES OF THE CAMERA CLUB.*

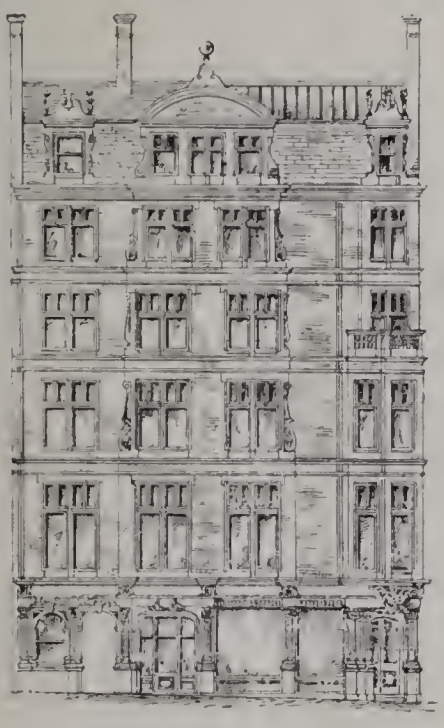
BY E. FERRERO.

The new club-house is being built according to plans prepared specially for the Club. At the outset a plan of the ground was given by the lessor to the new premises sub-committee (who had the fortune to have amongst its members an architect in Mr. J. Gale), and the plans prepared and proposed on behalf of the Club were substantially accepted by the lessor's architect, Mr. F. T. Pilkington.

In making the arrangements for the building, the committee gave their first consideration to the requirements of a photographic club, and it will be seen from the set of plans sent with this number of the *Journal*, that ample provision has been made for them. It was decided to have a number of separate dark rooms as well as a larger room, where work not requiring the absolute exclusion of white light could be carried out. Then a studio and an enlarging room were provided for. A large well-ventilated room for meetings was also considered a first necessity. Then the claim of the honorary librarian to a good room in which the collection of books could be displayed and used to the best advantage had to be considered, and the second best room was devoted to this purpose. Finally, a workshop was provided, which will be fitted with a table, cabinet-maker's bench, and a complete set of tools, which have been kindly presented to the Club by Sir David Salomons.

Having thus supplied all the possible wants of photography, it was decided to use the remaining space to provide on a moderate scale the usual attractions and conveniences of a social club. How far the committee have succeeded in their endeavours to give the Club as useful and comfortable a home as circumstances would allow, will be seen from the plans, and we now propose to take our readers over the whole of the premises.

The building is situated on the south side of Charing Cross Road, London, at the corner of Cecil Court. It is



of red stone and red brick, and it has a frontage of 51 ft. on the Charing Cross Road, and 50 ft. in Cecil Court.

* From the *Journal of the Camera Club.*

The entrance to the club is near the left corner of the building. On passing the glass swing-doors, the porter's lodge will be found on the left, and beyond that a stone staircase leads to the floors above. We will, however, proceed first to the basement. On reaching the bottom of the single flight of stairs, we find on our right a room containing the furnace, which will supply hot water to the whole of the house, and, beyond that, the servants' lavatory and dressing-room.

The second door on the right leads to the cellars. The passage from which these doors open will contain a number of lockers, where members can keep their photographic materials. Turning to the left we enter the daylight work-room. This is lighted from the roof, and will contain a sink, extending along one side of the room, with a number of taps for cold and hot water. This room is intended for washing negatives, developing platinotypes, toning, and all other operations not requiring a dark room. Opposite this room is a long passage, giving access to nine dark rooms, which will be provided with good ventilating arrangements, and lamps encased in concrete, so as to minimise the radiation of heat.

Proceeding to the first floor, we find on the left of the landing the cloak-room, whilst the door on the right leads to the still-room. Opposite the staircase is the entrance to the principal room, a handsome hall, 43 ft. by 26 ft., and 14 ft. 6 in. high. Special provision has been made for the ventilation of this room, and the manager of the optical lantern has obtained his heart's desire in having a space of the wall, 9 ft. square, painted white, in place of a movable screen, for showing slides.

Above the cloak-room a mezzanine has been arranged, which provides further accommodation for hats and coats.

On the second floor a third cloak-room, with lavatories, is provided. The passage leads from the landing to the dining-room on the right, the billiard-room on the left, and to the library at the end. The height of this floor is 12 ft. On the third floor the building becomes much shallower. A corridor similar to the one below leads on the right to the committee and secretary's rooms, on the left to the leads above the billiard-room (which leads will have a trellis floor, and will be useful for printing), and finally to the workshop or lathe-room.

The fourth floor is entirely taken up by the kitchen and other offices, and a bedroom and a living-room for a resident servant.

On the fifth floor is a good enlarging room with a dark room attached, and a fine studio 27 ft. long by 16 ft. wide, with a dark room.

A lift large enough for carrying coals and communicating with each floor from the basement to the kitchen will be provided, also speaking-tubes and electric bells. The house is to be wired for electric light, and a sufficient sum has been provided for the decorations, which will, however, not be added until next year.

The fitting and furnishing will now occupy the attention of the committee, and suggestions from members are invited, and will be carefully considered.

Phospho-boric Glass for microscopes is a new kind of optical glass, which contains phosphoric acid and boracic acid, and is designed specially for the construction of object glasses. It is asserted that by means of this new glass, lately produced in Germany, an object possessing no more than the one-eight-hundred-and-twentieth part of a millimetre can be distinctly recognised.—*The Monthly Magazine.*

PHOTOGRAPHY IN NATURAL COLOURS.

BY J. GAEDICKE.

Our present time is so much imbued with sensational novelties, that it leaves hardly any time to the normal development of science, and it gathers already, precipitately, the discoveries of future days. So it is with the photographic reproduction of natural colours. A notice passed through the journals, according to which the problem of colour-photography had been solved, and that the honours of this invention belonged to a photographer in Klausenburg, Mr. Veresz. But a close examination reveals the fact that said photographer has done nothing more nor less than what was already published by Niepce de St. Victor in 1852, and Poitevin and Simpson in 1866. He cannot show the least progress, as his preparations are much less sensitive, and the pictures are much less durable than those of his predecessors.

The practical significance of the matter and the progress may be sufficiently estimated, considering the necessity of exposures of "several weeks," and a fixity which had not been shaken "after lying in a lighted room" for several hours. In the face of these exaggerations of the Klausenburg accomplishments to the solution of the problem of colour-photography, and the fact that by such manœuvres the public is only led astray, it seems in order to recapitulate in a few words what has already been accomplished in the above-mentioned field.

The first observations about the printing of a coloured spectrum upon chloride of silver were published by Dr. Seebeck, in 1810. Sir John Herschel made also mention of colours upon chloride of silver in 1839.

Becquerel was the first who obtained a spectrum with all colours. After having been occupied with this matter since 1838, he presented, in 1848, his first report to the Paris Academy of Sciences. He employed a highly-polished silver plate, which, fastened to the positive pole of a battery, he immersed in diluted muriatic acid (1 : 8) and passed a platinum wire, connected with the negative pole, into the solution. The silver plate became tarnished by absorbing chlorine, and took up gradually a number of colours. By prolonged action there was a repetition of the colours, these representing the number of the second degree. He continued this until he obtained a colour number of the fourth degree, whereupon, later on, according to experience, the most brilliant colours developed. Becquerel determined also the quantity of the chlorine which was taken by the plate by inserting a voltameter, and measuring the hydrogen gas developed in the same, which gave the quantity of the utilised chlorine. He determined that the best results are obtained if about 6·5 c.c. hydrogen per square decimetre of the plate are absorbed. Becquerel found further that, if the chlorinised plate was exposed for a longer period to a temperature of 30 to 35 degrees C., it would give much lighter colours, and that the action of the temperature can be matched by exposing the plates under a combination of ruby and cobalt glass for one to two hours to sunlight. The film becomes hereby dark violet, and is bleached in the camera by white light, and is coloured correspondingly by coloured light. The colours appear here light upon dark ground. In the camera one has to expose for several hours with a very bright light, and the pictures so produced are said to be visible in the dark, while they disappear gradually in light. Herschel reports, in 1855, that a coloured spectrum picture which he obtained from Becquerel, but which he kept in the dark and examined only by lamplight, was not decomposed after several years, although it had bleached a little.

The next progress in colour photography was made by Niepce de St. Victor, who presented his investigations about this subject in 1851 and 1852 to the Paris Academy of Sciences. Niepce used also silver plates as a basis, but simplified the chlorination by using baths containing chlorides in place of the galvanic battery, and found that additions of certain flame-colouring salts increase the capacity of reproduction of the corresponding colours and the sensitiveness. As the best of chlorinizing means he used a mixture of chloride of magnesium and sulphate of copper. Afterwards the plate is heated until it shows a bright red colour.

In this way he obtained camera pictures in fifteen to thirteen seconds in the sun, or sixty seconds in diffused light with rapid objectives. The durability was also increased by Niepce by applying for fixing a solution of chloride of lead with a subsequent coating of tincture of benzine. At the Paris Exhibition of 1867 there were heliochromic pictures, produced by Niepce, which, according to the records of the French Photographic Society, had kept well preserved during the seven months' exhibition, and which suffered only a little in the brilliancy of the colours. The pictures were exhibited in a case, which was opened for inspection, and then closed again.

According to Niepce, the spectrum colours will appear truly, while the pigment colours do not appear always in the same shade. Emerald, for instance, or arsenic copper, shows green, but a green mixture of chrome yellow with ruby blue will come out blue. Orange produced by yellow and red glasses placed together will print as red.

In 1866 Poitevin appeared with a new heliochromic process, in which he used paper as a support. He floats plain paper on a chloride of sodium solution, and after floating on the silver bath, washes with water in a dish, and pours into the last water a solution of chloride of tin, exposes the dish to light, and lets the paper become dark violet in from five to ten minutes. He washes now with water and dries in the dark. The paper is now made sensitive by immersing the same in a bath consisting of an equal volume of a 5 per cent. solution of bichromate of potassium and a concentrated solution of sulphate of copper, after which it is dried.

Under a coloured diapositive this paper will give, exposed for half an hour to the sun, or for one and half days to diffused light, a clear coloured picture upon dark ground.

Poitevin obtained also coloured pictures with collodion. Simpson produced in 1866 coloured-light impressions upon chloride of silver collodion by printing under aniline colours and coloured glasses.

Saint Florent communicated to the French Society of Photography, in 1882, his process for producing colours photographically upon paper.

During later years a more extended research was published by Carey Lea, in which he designates compounds of chloride of silver with very little chloride of silver as photo salts, and proves that with different descriptions of chloride compounds different colours will originate.

The final result is, that twenty years ago we were more advanced regarding the sensitiveness and durability of the products than Mr. Veresz is at the present day, and that there is no reason yet to consider the problem of photography in natural colours as practically solved.—*Photographisches Wochenblatt.*

HOW TO MAKE A GROUP.

BY CHARLES P. MARSHALL.

"How to make a group." One might as well ask how to compose a nocturne, or try to describe the process. The art of composing must be inborn; it is a gift. No amount of art education will develop what is not there.

One may learn to imitate, but does he compose? He may vary another work, yet is it composition? However, there are a few conscientious persons who can look upon another's composition, and, without trespassing, use the variations of some well-known principle set forth. On the other hand, there are many who, without scruple, literally copy mass for mass, and line for line. They create a new title, and with great aplomb dash in their autograph. Is such an act a composition? No, it is not. Then it smacks very much of plagiarism.

We often borrow from another when we think we do not. Friends of the craft, be on your guard, lest in your picture, when deeply interested, you thoughtlessly incorporate another's idea. Watch your work, that the fruit of another's toil creep not in. In your admiration for some choice passage you may unconsciously borrow it, thinking it your own, because it so thoroughly coincided with your taste. The above is written from experience.

It is difficult for the young artist to produce a meritorious composition, all his own. If he has devoted only a year to picture-making, then he lacks experience; and if he finds that the latent composer is not within him, better seek another vocation.

The reader will please consider what has just been written as simply observation and experience, and not a tirade against the fraternity.

How many of us in our younger art-days have passed through a similar experience. How many of us can look back to a heterogeneous mass of light and shade, our first picture, and recall the trials, struggles, and disappointments over that first effort, and many subsequent ones. In our crude manner, how we gauged our production by the work of some well-known artist of repute—not in principle, but in minutiæ. Disappointment seized us if we could not lay our ideal over our own work, and make it coincide in light, shade, and line. We were too apt to give the greater share of our study to certain little points, which, in reality, were only individualisms. We omitted to search out the principle of our ideal, and hastened on to study detail in finish.

We tried to saturate ourselves with someone else's individuality; that is how so many of us drifted into plagiarism. When we step out of that rut only can we progress. Study the principles in other's works, but let alone their individuality. Is your own not worth cultivating?

Education of the eye is the pivotal point in picture-making. But to educate the eye takes time. It cannot be done in one year, or two, or three, or four. Don't expect too much within a period of seven years. And before this, one should be well schooled in the alphabet of art; that is, should be able to draw well, understand colour, harmony, and artistic anatomy. All this is simply getting your tools together.

The eye becomes educated when you are thoroughly conversant with them; when you can look at a picture and fully understand it, without the necessity of revolving in the mind all the rules of proportion, balance, line, breadth, and perspective; to speak vulgarly, when it becomes "second nature."

We have thus educated the eye sufficiently to start with; now let the young artist turn his thoughts to a composition. First choose something thoroughly comprehended—let us say a small group. Select a situation from something you have actually seen, not what you have observed in some one else's picture. In making choice of a subject, choose one where the story can be well told without difficult arrangement. Think it all out before you attempt the first thing. When you have mentally digested it, then you may trust it to paper. Sketch in first a general outline, then lay in with stump the great masses of shade. Every stroke will offer a new idea. Gradually give your sketch more form. At this point, if you decide that a radical change is better, start a new sketch, only improve it in form as compared with the first.

Now, once more take the stump, and, with more ease, mass in your shade, carrying it somewhat farther toward good form, then sketch number one. (Never destroy an original sketch; you will prize it in the future as a valuable note.) Compare your two sketches; be harsh in your criticism; sit in stern judgment on your work; always be ready to *cut out* rather than *add to* a composition (I refer to accessories). Many a good production is spoiled by a so-called *coup de grace*, which literally *was* a *finishing stroke*. Stop where you are for awhile; take several days to think what you have done; something may present itself to alter your ideas.

We will now consider your main plans as permanent. Now make as fine a drawing of your picture as you possibly can. Make notes of the time of day necessary to proper lighting, of age and size of models, of accessories needed. If your models are not too young, always instruct them as far as you can all about the picture. Many children, and most grown people, can get a pretty good idea of your picture and the *rôle* they are to play, if you will take pains to carefully explain it to them. Under these conditions your model will be enabled to assist you. If your model does not understand *why* you place him or her in such and such a position, why you ask for such and such an expression, then he certainly cannot perform his part naturally. What to you may seem a bright idea, to him will appear silly and affected, and the brilliant situation you had in mind will be rendered in burlesque. In choosing models, never take one that is shy, for no amount of coaxing will overcome it. Choose a willing one, though he be made of pepper and snuff.

One or two rehearsals is always best; it imparts more to the models than simple words without action. Avoid fatigue by giving long positions. In short, I consider these rehearsals as indispensable, because the novelty of the situation must wear off before you can get the best effort from your models. Even when your models are not around, it is well to rehearse your accessories, more particularly the lighting. By a thorough study of *this* point you are enabled to light the model better. Remember that in most compositions you are seeking a harmonious whole, and not the individual lighting of any particular face or figure. Here you must lay aside portraiture lighting, for you are about to tell a story in light and shade, to illuminate many objects, and not to produce a picture all in one face.

You are now ready for your final work—lines decided upon; time and lighting in mind; and models in place. It is expected at this point that you are thoroughly satis-

fied with all arrangements (size of picture, elevation of camera, lens necessary—rapid long focus variety—distance, and kind of plate.) Now bring out your camera, and not before. Remember your camera is a whole set of instantaneous drawing pencils, stumps, blenders, parallel rulers, proportional dividers, and paper; the picture is in you, in your mind's eye, not in the camera-obscura. Never torture your subject by doing your work on the ground-glass; fetch it forth only when all is ready. Carefully but quickly focus, the critical moment arrives. If you thrash around, and dance all over the room, squinting this way and that, you will upset your model's choicest effort. Stand by the "casel," the camera, where the picture is about to have birth. Now you are a manager, with so many actors before you. In gentle voice, give your final coaching; wait a moment for it to take effect. "Still now, please;" remove the cap easily and moderately slow; it will be less observed by the models; your heart beats in sympathy as the seconds slowly pass, and if your magnetism has gone out with your kind words, then you may hope for a successful "group."—*Wilson's Photographic Magazine.*

ALUMINIUM IN THE CONSTRUCTION OF PHOTOGRAPHIC APPARATUS.*

BY ERNEST SEYD.

In 1856, according to Maugin, the price of aluminium in its metallic state was about £5 10s. per grain; its present price, owing to the exertions of the Aluminium Company, has been reduced to 6s. per pound, and the value of the pure metal is being slowly recognised in this country by the makers of philosophical apparatus where extreme lightness combined with strength is required. Aluminium can now be obtained in sheets, bars, or drawn tubes, and, from its extraordinary ductility and tenacity, wire as fine as a hair can be produced. Its specific gravity is 2·56; the metal fuses at a dull red-heat. It is asserted that cannon have been made from it, and it is known that the Emperor William III. had a suit of armour constructed entirely out of the pure metal.

To those members of the Camera Club who combine a mechanical genius with the lighter labours of the hand camera, and who may be debating within themselves the possibility of constructing an apparatus which shall combine *all* the perfections claimed by the different advertisers, with *none* of the imperfections invariably discovered afterwards, a few words on the working and adaptability of the metal may not be unwelcome. Aluminium should be turned on the lathe at a quick speed with a very low-angled tool, and, to avoid the clogging that takes place, paraffin oil may be used freely as a lubricant. It will not stand too much hammering, and cannot be soldered, and although the Aluminium Company are, it is stated, about to bring out a receipt for this purpose, it may be doubted, with justice, if the same satisfactory results will be achieved as in the case of other metals and alloys.

Aluminium, being nearly four times lighter than brass, and almost as strong in proportion, its adaptability for large cameras is unquestioned. It has no effect upon silver salts, and is quite unaffected by damp; does not tarnish; and, with the exception of hydrochloric acid, remains unchanged in the presence of the strongest acid fumes. Messrs. Beck, of Cornhill, show some lenses, where the metallic casing is entirely aluminium, and by comparing the weight of these with others of the same size mounted in brass, the difference is much in favour of the white metal, and there is no doubt that a saving of some fifty per cent. in weight could be effected in a photographic outfit by the substitution of aluminium for the metallic fittings of our cameras; and it is to be hoped, therefore, that some enterprising maker will bring aluminium into practical use, for although some attempts have been already made in this direction, it would seem that amateurs are not expected to pay so much for the small differences in cost of workmanship as for the novelty of the application itself.

To the practical man, however, the metal presents some drawbacks in its manipulation; it cannot be cast, on account of its extreme lightness, with the same ease as the copper alloys: it tarnishes in sea air, and is more easily damaged and scratched. Weight for weight it is stronger than iron; but bulk for bulk it is not so strong as brass. It is possible that this difficulty might be overcome by the addition of tin, or other alloy, as the tensile strength of an impure kind of aluminium. Bronze produced by the smelting of a mixture of copper and corundum, through the agency of immense dynamos in the Cowles process, is from 103,000 up to 129,000 pounds to the square inch. There is a certainty, however, that the application of pure aluminium to photographic purposes is capable of considerable extension, and it is to be hoped that the mechanical portion of the Camera Club may be induced to show themselves to more advantage by experimenting with what is practically a new metal, first known as a greyish powder by the German chemist Wöhler, in 1828; reduced through the medium of sodium to a metallic form by Sainte-Claire Deville, some thirty years later; and, finally, produced as a marketable commodity, some two years ago, by the Castner process.

* From the *Journal of the Camera Club.*

Light for the Developing Room.—We have often said that ruby was the only safe and suitable light for the development of the modern gelatino-bromide plate, and still maintain that theoretically it is so. But practice and theory do not always go hand in hand, and the result of a series of experiments that we saw conducted by one of our friends a few days ago has induced us to somewhat modify our opinions. The dark-room in which the experiments were made has three windows, each about 22 by 16 inches, and filled in with deep ruby glass. Two are "borrowed" lights, and so safe enough; the third faces the west, and at the time of operation was in full sunshine. In addition to those, there was a small window about 9 by 7 in one corner, and it was close to this, or about six inches from it, that the plates were developed. This window is lighted by a gas jet, a No. 3 burning within four inches of the glass, which is one sheet of green between two of yellow, or yellowish orange, but altogether so pale that at first we thought it was merely a sheet of ordinary glass, and refused to believe that plates could be developed under it without fog. But "the proof o' the pudding is in the preein' o't," and we saw half a dozen of Cramer's "40" plates that had been snapshotted on groups of children, and consequently requiring protracted and pushed development, successfully developed, and without a trace of fog, under the light. The owner of the dark-room has for some time been suffering from weak or easily inflamed eyes, and with her it was simply a question of finding a light other than ruby, or giving up the pleasure of the dark-room altogether. The comfort of the greenish-yellow light is greater than can be believed by those who have not tried it; and while, as no light is absolutely safe, it is so nearly so that on putting an unexposed plate into the developer, leaving it for fully five minutes close to the window, with the burner turned on full, it showed on being fixed only a hardly perceptible opalescent trace of fog.—*The Beacon.*

THE BRITISH ASSOCIATION AT LEEDS.

The next meeting of the British Association will be held at Leeds, and open on Wednesday evening, September 3rd, under the presidency of Sir F. Abel, of Woolwich Arsenal. There will be a reception and *conversazione* by invitation of the Mayor of Leeds: on Friday, at 8.30, a discourse on "Mimicry," by Mr. E. B. Poulton, M.A., F.R.S., F.G.S.; on Saturday, a lecture to the operative classes *(members not admitted)*, by Professor John Perry, M.E., D.Sc., F.R.S.; on Monday, at 8.30, a discourse on "Quartz Fibres and their Applications," by Professor C. Vernon Boys, F.R.S.; on Tuesday, a *soirée*. The work of the Association will be divided into the following sections, which will meet daily at 11 o'clock for the reading and discussion of addresses, reports, and papers: special facilities being afforded for the discussion of subjects of local interest:—

A.—Mathematical and Physical Science, including pure and mixed mathematics, astronomy, sound, heat, light, and electricity. President, Mr. J. W. L. Glaisher, D.Sc., F.R.S., V.P.R.A.S.

B.—Chemical Science, including applications to manufactures, dyeing, and agriculture. President, Professor T. E. Thorpe, B.Sc., Ph.D., F.R.S., Treas. C.S.

C.—Geology, including applications to coal and other mining. President, Professor A. H. Green, M.A., F.R.S., F.G.S.

D.—Biology, including anatomy, physiology, zoology, and botany. President, Professor A. Milnes Marshall, M.A., M.D., D.Sc., F.R.S.

E.—Geography, including recent explorations. President, Lieut.-Col. Sir R. Lambert Playfair, K.C.M.G., F.R.G.S.

F.—Economic Science and Statistics, including applications to educational and social problems. President, Professor Alfred Marshall, M.A., F.S.S.

G.—Mechanical Science, including applications to civil, mechanical, and marine engineering. President, Captain A. Noble, C.B., F.R.S., F.R.A.S., F.C.S., M.Inst.C.E.

H.—Anthropology, including the characteristics and distribution of the various races of men. President, John Evans, D.C.L., L.L.D., V.P.R.S., Pres. S.A., F.L.S., F.G.S.

We understand that many of the principal manufacturers have already kindly promised to open their works for inspection, and from the great variety of trades carried on in Leeds, the courtesy will be appreciated by all members and associates. The manufacture of iron in all its varieties from clay ironstone, and its application to the construction of stationary and locomotive engines, of pumps, tools, machinery for every purpose to which machinery can be applied, of weighing and testing machines, of arms; the manufacture of cloth, flannel worsted, and other woollen goods, of ready-made clothes and caps; the operations of dyeing, tanning, and leather dressing in all its branches; the manufacture of sanitary tubes, quarries and firebricks; brewing; soap making; flax spinning and linen weaving; the manufacture of sulphuric acid and other chemicals, of glass bottles, artistic pottery, boots and shoes, soda-water; the operations of milling and sawing wood and stone, of making writing, wall, and other papers, afford the most varied opportunities to those interested in industry.

The Photographic Club.—Subject for discussion on Wednesday, August 13th, "Extemporising Apparatus;" August 20th, "Actinometers and Photometers."

Patent Intelligence.

Specifications Published.

11,416. *July 16th*, 1889.—"Photographic Cameras and Shutters." Benjamin Joseph Edwards, The Grove, Hackney, London, Manufacturer.

This invention relates to improvements in the shutters used for exposing the sensitive plates or films, and in the appliances for changing them, also in the holders or sheaths used for carrying such plates or films. My objects are, first, to facilitate the regulation of the time of exposure so that the same instrument may be successfully used for extremely rapid or for prolonged exposures, and that better protection may be afforded from the light previous to exposure.

Second, to combine in one operation the setting of the roller blind shutter and the removal of the plate after exposure.

Third, to provide a means for holding flexible sensitive films so that they may be curved to form the arc of a circle of any required radius, thus bringing the sides of the picture, which is formed on the hollow side, more into focus of the rays from the lens, so obtaining better definition than is possible with films used in the ordinary way.

In carrying out the first part of my invention, I combine the shutter known as the "roller blind shutter," which was described and shown by me in 1882, and which has since been extensively used for what are known as instantaneous exposures, with an ordinary pivoted or flap shutter in such a manner that both may be used in combination, or the flap shutter may be employed separately. The mechanism which I employ for working the shutter or shutters may be hand, pneumatic, hydrostatic, or other convenient style, and is so arranged that when the flap is lifted, a catch which holds the roller (the spring of which has been previously wound up) shall be released, and the shutter allowed to descend. When the pivoted shutter is to be used alone for time exposures, the roller shutter is set so that it shall be open, and is fixed in that position by a clamp catch or other convenient arrangement. I do not confine myself to any particular position for the roller shutter, which may be in front of or behind the lens, but I prefer to place it immediately in front of the sensitive plate. The use of the two shutters in combination forms an additional protection to the plates previous to exposure, the flap covering the lens, while the roller shutter is set, and until it is brought into use.

In carrying out the second part of my invention, I combine with the roller blind shutter, used separately, or in combination with the flap shutter, an arrangement for exposing a succession of plates by removing the plate which has been exposed, thereby leaving the next plate in position for immediate use; this I do by securing in a suitable position on the flexible blind one or more projections or hooks which fall with the shutter when the plate is exposed, and engage with the plate or its frame or carrier; thus when the roller shutter is again set or wound up, the plate is drawn or raised with it. In adapting my camera, which may be of the type known as the "detective," to suit this part of my invention, I divide it into two compartments longitudinally, each of which will hold a number of plates, each plate being fitted into a sheath or carrier of paper, wood, metal, or other suitable material, and these I place one behind the other, and keep in position by means of a spring or other contrivance in one of the compartments (preferably the lower one) after having wound up or set the shutter. On releasing the shutter the plate is exposed, and the hooks or projections engage with it, ready to draw or lift it into the second compartment when the blind is again set, the operations being repeated until all the plates are used, and removed to the second chamber, when they are taken out and a new set placed in the first.

In carrying out the third part of my invention I do away with the flat surface now used as a support for the flexible film or sensitive paper, and I make the holder, or sheath, or support curved to the required radius, or I leave a sufficient space at the back of the flexible film to allow of its being bent to the required curve, and held in such position by pressure at the

edges ; when continuous bands or separate pieces of sensitive paper or films are employed, they may be placed or drawn round a curved plate of glass, and thus held to the required radius, the photograph being taken through the glass.

The other parts of the camera may be of any convenient form or type such as are at present in use.

7,010. *May 6th*, 1890.—"Photographic Cameras." BENJAMIN JOSEPH BARNARD MILLS, 23, Southampton Buildings, London, Patent Agent. A communication from LOUIS LOUMIERE, of 21 and 25, Rue Saint-Victor, Lyon-Montplaisir, France.

The invention is particularly applicable to portable photographic apparatus, and has for its object to present successively and at will behind the lens a certain number of plates previously enclosed in the apparatus, and to shut them up one by one—as they have been used—in the bottom of the camera, whence they are withdrawn only in the dark room. This result is obtained by simple apparatus worked from the exterior.

The inventor claims :—

An arrangement of camera in which a number of plates contained in frames furnished with trunnions are suspended one behind the other in front of the lens, and are pushed by a spring, the first frame, and in succession the following ones, being capable of removal by a notched disc operated from the exterior, and then of swinging on to the bottom of the camera by turning on their lower trunnions.

9,058. *June 11th*, 1890.—"Lamps for Enlarging or Copying Photographs." JAMES CHAPMAN SHENSTONE, 13, High Street, Colchester, Essex, Chemist.

This invention relates to lamps used for enlarging or copying photographs and the like, with the aid of an ordinary photographic camera, without the use of a lantern or condenser, the object being to render these lamps more handy in use and efficient in operation.

With these ends in view, the invention consists of a lamp having an oil lamp and a spirit lamp with magnesium ribbon burner, capable of being moved transversely across the lamp to bring the one or the other into a central position, as required for focussing or printing.

The inventor claims :—

1. The improved lamp for enlarging or copying photographs and the like, substantially as and for the purpose set forth in the specification.

2. In a lamp for enlarging or copying photographs and the like with an ordinary photographic camera without the use of a lantern or condenser, adapting the focussing oil lamp and the printing magnesium ribbon burner to move transversely across the lamp for the purpose of bringing the one or the other into a central position.

9,062. *June 11th*, 1890.—"Treating Emulsions in Centrifugal Machines." CARL DIDRIK HELLSTROM, Engineer, Stockholm, Sweden.

This invention seems to be intended to apply chiefly to the making of butter, but as it contains curious results of scientific research as to the motions of particles in emulsions subjected to centrifugal force, we quote the portion of general scientific interest.

In an emulsion the particles of fat are in the form of spheres of very different sizes ; for example, in milk, the largest are of about twenty times greater volume than the smallest. Each sphere of fat is surrounded with a zone of the surrounding liquid. The zone lessens the flotation of the spheres of fat in proportion to the size of the latter, so that the smaller spheres no longer possess any flotation ; these cannot be separated by centrifugal action alone, except when the larger spheres draw them in a manner with them. The path of the larger spheres through the mass under the influence of centrifugal action will be an unbroken line. When, however, the mass also receives a motion parallel to the axis, the larger spheres which possess flotation will, on account of their small density, receive a relative motion in an axial direction. If the axial motion continually changes its direction, the larger spheres will travel in a zig-zag course about the line which in the absence of axial movement would have been the path. The larger spheres so travelling will continually collide with the smaller spheres of fat, which on account of the surrounding zones do not take part in the relative motion. The separation of the fat is rendered more complete by this method. As the axial movement in the mass gives rise to pressure, the particles will coalesce, and the enlargement of the at first small particles of fat takes place fairly quickly throughout the mass. On the surface this enlargement of the spheres of fat is hastened by the movements originated by the axial motion. In centrifugal action the surface places itself normally to the resultant of the centrifugal force, and gravitation ; if there be also axial motions the surface tends to place itself normally to the resultant of all three ; as, however, the axial motion is variable, both as regards amount and direction, the particles on the surface have a wavy motion. This takes place quite symmetrically round the axis, so that a section which is placed perpendicular to the axis will be alternately extended and compressed, and by this means the particles of fat will be made to unite. By each union of two spheres a portion of the liquid which envelopes the spheres will be liberated ; the fat, therefore, is more thoroughly freed from liquid than by centrifugal action alone.

When the temperature of the emulsion is such that the fat is cool, the transition to a firmer state of aggregation is hastened by the repeated variations of pressure ; if, for example, milk is treated at a temperature under 23° C., in this way, butter is produced. With continuous inflow and outflow the process is made continuous.

The inventor claims :—

1. The process substantially as described for the separation of fat from emulsions, wherein the emulsion is exposed to the simultaneous influence of rotary motion, and of motion either quite or nearly parallel with the axis of rotary movement.

2. Apparatus substantially as described and illustrated by the drawings accompanying the specification.

52,750. "An Improvement in Transferring from Zinc or Copper Plates to Lithographic Stones or other Metal Plates, so that the Transfer will Print Exactly in the Original Size" (German Patent).

The invention, which is hereafter described, has for its purpose the transferring or reprinting of engravings, or of designs on copper or any other metal plates, in exactly the original size, and this, up to the present time, people were never able to get. The process is the following :—The engraving or the drawing, on a plate of copper or other metal, must first be coloured after the manner known to most printers. Place then, upon such a plate, transfer paper, and upon this transfer paper place a sheet of unsized copper-plate paper. Pull the plate under a moderate pressure through the press, which will cause the transfer paper to adhere firmly to the plate, and place then upon the transfer paper a sheet of strong paper that will not easily stretch, after having previously gummed the lower surface of it ; before placing the latter paper on the transfer book, dampen both slightly. Now pull the plate again through the press, but under stronger pressure. This will cause the upper paper to form one layer with the transfer paper. Then place upon this, without removing it from the plate, a folded blanket, or any other elastic layer, and pull it several times through the press again, under heavy pressure. Only after the printing plate or stone upon which the transfer is to be made is fully prepared for this purpose, this layer, the preparation of which has just been described, is lifted from the other plate and placed upon the prepared plate to be treated as usual. Whoever will try this process will find that it will yield an absolute exactness of size in all directions. The patent claim is : A process to transfer engravings or any other kind of printing from metal plates in absolutely exact original size to lithographic stones or metal plates for the purpose of printing ; and this process consists of connecting the paper which is used for the transfer, after it has become adherent to the stone or metal plate by once pulling through the press, with the upper layer of strong paper, or other material which will neither stretch nor shrink (after the latter has been gummed on its lower side) by repeated pulling through the press.

Correspondence.

"THE TREATMENT OF SUBJECTS BY FOCUS."

Sir,—Mr. W. K. Burton's letter in your last issue requires a lengthy answer. It is to be regretted that Mr. Burton is so far away from England for controversial purposes. Had he seen my letter sent to you a week or two ago, pointing out his error in regard to what he deemed a new aspect in spherical aberration in its bearing on the formation of images, he would probably not have repeated—had he understood it—the errors which he has only emphasised in his article in your last week's issue.

Mr. Burton certainly has very much misunderstood me and the subject too, but still he suggests: "If Mr. Dallmeyer had confined himself to claiming one phase of the question, he would have been on safe ground, but he has tried to prove too much." I shall show Mr. Burton in an article—if you can afford the space—that I have succeeded in proving *fact*, and I cannot help thinking it a pity that Mr. Burton should give himself away in connection with a subject which he probably has not had the same opportunities that I myself have had of investigating; but I understand Mr. Burton to be a gentleman whose sole object in all controversies is to arrive at the truth of a question, and under these circumstances it will be a pleasure, and not an irksome duty, to point out the errors into which he has fallen.

I hope to have my article ready for your next issue, and then and for ever "lay this ghost!"

Thomas R. Dallmeyer.

25, *Newman Street, London*, W., *August 4th*, 1890.

THE LANTERN SOCIETY.

Sir,—The Lantern Society has obtained the use of the rooms belonging to the Royal Medical and Chirurgical Society at 20, Hanover Square, and, through the courtesy of their committee, at a very moderate rental.

These rooms are centrally situated, and are frequented by several scientific societies, amongst whom are the Royal Microscopical and Quekett Clubs.

Meetings will be held for the purpose of reading papers and exhibiting lantern slides on the second and fourth Mondays in each month, from October to April inclusive, at 8.30 p.m.

Several applications for membership having been received from ladies, the Council desire it to be known that they are eligible for election.

Charles E. Gladstone, R.N., *Hon. Sec.*

6, *Bolton Street, London*, W.

The informal but pleasing gatherings on Thursday evenings continue at the Camera Club. A few members regularly meet to discuss photographic affairs, and to examine any apparatus or pictures presented. During the past month the Club has had upon the walls some of the platinotype prints of hunting scenes sent by the Vienna Club.

Perfumed Photographs.—To meet the fastidious taste of some of their customers, English photographers are perfuming their photographs before sending them out, and Mr. A. H. Norman suggests for the purpose keeping the mounts in a box along with a few of the scented sachets sold by perfumers, Photographers on this side might adopt the notion, and perhaps get an additional half dollar a dozen for the novelty. They can do better, however, than pay fancy prices to the perfumer, and at the same time have a perfume to their own tastes, or even to the tastes of their customers, for that matter. All that is needed is to take, say, four ounces of powdered orris root, and incorporate with it thoroughly, small quantities of various essential oils. Of course, in the selection of the oils and proportions, each photographer will be guided by his own taste. By ringing the changes on the following, any desired style may be obtained. Bergamot, true cinnamon, citronell, clove, geranium, lavender, neroli, and sandalwood. The *pot pourri* may be placed in a thin muslin bag the full size of the bottom of a tight box, and the mounts for to-morrow's use put into the box to-day.—*The Beacon.*

Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting on the 31st ult. Mr. J. J. Briginshaw occupied the chair.

Mr. J. B. O'Connor was elected a member of the Association.

The adjourned discussion on "Printing under Coloured Glass" was proceeded with.

Mr. Otto Scholzig exhibited a strip of sensitised albumenised paper which had been printed in sections under various coloured pieces of glass. In each case the printing was continued until the same depth of colour was reached. The paper was then toned, the following bath being used:—

Borax	1½ drams
Uranium nitrate	4 grains
Gold	3 ,,
Water	24 ounces

A difference of tone in the various sections of the paper was noticeable, those portions of the paper that had been printed under green and dark yellow glass appearing to give the best results. Mr. Schölzig said he had tried printing under various coloured sheets of celluloid, the brownish-yellow and green producing excellent tones; but prints exposed under other colours he found difficult to tone. Printing through a green medium gave a bluish-red colour, which toned rapidly to a rich black, and did not fix out. He believed a perfect substitution of the gold took place. He had placed plain paper prints, after toning to this colour, in a five per cent. solution of nitric acid without any appreciable detriment to the image. In printing from a negative, one-half through green glass, and the other half exposed to white light, the printing being continued until both halves of the print were of the same depth, a great difference was found, to the advantage of the half exposed under green glass.

Mr. Scholzig also showed two strips of sensitised paper, toned and untoned, that had been printed in different sections under coloured pieces of glass, showing alteration of tint caused by the various media through which the light had passed. The difference in the time of printing under green glass, he stated, would be about three times that of white light. A print but just rinsed in water previous to toning would take up more gold and yield a much blacker tone, and, in consequence, would be more permanent, than a print that had been thoroughly washed previous to toning.

Mr. W. E. Debenham said, referring to the last statement, that the published experiments of Mr. W. K. Burton proved exactly a reverse conclusion. A print that had been thoroughly washed previous to toning, although of a different colour in the bath, continued to tone, whereas in the second case the blue stage would be reached before all the silver was replaced. He thought these conditions might apply in some way to printing under green glass. Mr. Debenham referred to the results of his experiments in this direction exhibited at last week's meetings. Printing under green glass certainly produced another colour in the finished print, but he maintained that in the majority of instances a loss of richness of tone was the result.

Mr. J. S. Teape showed three prints, two of which had been printed under green glass, and one under white glass. With the former he was able to get a rich black tone which he was unable to produce in the latter. He also exhibited a series of prints from the same negative ranging over various lengths of exposure, with the result that the shorter the time of printing the more it became necessary to prolong the toning operations. In printing through green glass, he had found that the print did not appreciably lose its bluish tint in toning; the bath he used was as under:—

Saturated solution borax	1 ounce
Gold	1 grain
Water	6 ounces

Mr. H. M. Hastings showed some sheets of sensitised albumenised paper, portions of which had received a preliminary exposure; part of the paper was then washed, and further exposed under green glass. It was found that with the part of the paper that had received a preliminary exposure, the printing

proceeded more rapidly than the remainder of the sheet. Ruby glass was also tried with a similar effect.

Mr. W. E. DEBENHAM said that a possible explanation why printing in a weak light might yield a better result was that the length of time necessary to print in a weak light allowed the chlorine given out during printing to escape; whereas with rapid printing it would be evolved too quickly to admit of this, to the injury of the richness of the print.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

AT the meeting in the Association's Club Rooms, 3, Lord Street, on Thursday evening, the 31st July, Mr. PAUL LANGE presided, and expressed the great pleasure it gave him in once more meeting the members of the Association after his trip to Iceland. He had undergone as extraordinary an experience as it was the lot of any man to undergo, and he had passed through much hardship and fatigue. He thought he had accomplished a feat no man had done before in managing to climb up 5,200 feet and photograph the Crater of Hecla, which he had done successfully.

The following candidates were elected members:—Messrs. Herbert E. Cox, Arthur Workman, Herbert T. Mallabar, Rev. A. M. Lewis, C. R. Jones, and Edward King Ellison.

Mr. C. B. READER reported about the excursion to Bolton Abbey, and gave some interesting information as to the progress of the "Liverpool Illustrated" return set for the Boston Camera Club (U.S.A.)

A novel tripod, the invention of Mr. William Tomkinson, and designed by him for hand-camera work, was exhibited and explained by the inventor.

Mr. A. TYRER exhibited a number of photographs taken at Bolton Abbey by Messrs. Tomkinson, Phillips, and the hon. sec. (Mr. E. M. Tunstall), views of the interior of Eaton Hall; the last named showed some whole plate prints of Moreton Old Hall, secured during the excursion in the Convention week.

Mr. Watmough Webster's photographs of the Convention groups were handed round.

Mr. H. H. Williams was elected an honorary member.

Mr. T. W. WADE, Vice-President of the Manchester Amateur Photographic Society, was then called upon to give his paper entitled, "Landscape Photography," which he illustrated with rapid sketches in charcoal, and for which a hearty vote of thanks was accorded.

The PRESIDENT announced the excursion for the month of August, viz., to Rufford Hall, on Saturday 9th inst. (half day), and to Haddon Hall on Wednesday, 20th inst. (whole day).

THE WEST LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held on the 25th ult., Mr. CHAS. BILTON (President) in the chair. Dr. St. Clair Buxton, and Messrs. Lynn, Ward, Holmes, and Kendall, were elected members.

The question of the advisability of removing the *locale* of the Society from the Addison Hall to the Lecture Hall, Broadway, Hammersmith, was considered, and a motion in favour of the suggested change was carried. The remainder of the evening was occupied in exhibiting and criticising work done at the summer excursions.

It was announced that the next outdoor excursion would take place on the 9th August. Members to meet at Greenwich Pier at 3.30. On 23rd August the members meet at Hanwell Station for an excursion up the Brent. On Sept. 26th a meeting will be held at the Broadway Lecture Hall, Hammersmith.

RECEIVED:—Messrs. John J. Griffin and Son's Illustrated Catalogue, consisting of nearly 200 pages, neatly printed in chocolate ink. In addition to the well-arranged trade catalogue, there is a large amount of useful information in the shape of formulæ and descriptive matter.——Messrs. Gauthier Villars forward a copy of "La Photographie Judiciaire," in which M. Alphonse Bertillon, of the Prefecture of Police, sets forth the general principles of his photographic and authropometric method for the identification of criminals. This interesting little book of 116 pages is richly illustrated, the photographs published being anonymous portraits of individuals deceased or transported to the Colonies.

Answers to Correspondents.

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

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

L. E.—*Glycerine in the Developer.* With pyrogallol it seems to play the part of a mild restrainer, and, when employed in the stock solution, helps to keep it from decomposition. It assists, likewise, in promoting the easy flow of the developer over the plate. Mr. B. J. Edwards's formula is as follows:—

No. 1.—Pyrogallol	... ...	1 ounce
Methylated spirit	... ...	7 ounces
Glycerine	... ...	½ ounce
No. 2.—Bromide of potassium	... ...	120 grains
Distilled water	... ...	7 ounces
880 ammonia	... ...	1 ounce

The above are stock solutions, which require to be diluted for daily use, each with fifteen parts of water. Then, for developer, mix the two together in equal parts.

R. D. (Skipton).—*Silvered Glass.* Assuming that you mean looking-glass (tin amalgam), and not real silver deposited from solution, details for which were given in these columns a year ago, proceed as follows. Procure a flat wooden board, on which lay a piece of tin-foil a little larger than the glass to be silvered, then amalgamate the tin surface with a drop of mercury and a hare's foot; flood on more mercury, and then slide in the glass plate, apply weights, and rear up the board to drain off all excess. This done, again lower it to the horizontal position, and leave it for a few hours under pressure to harden.

L. N.—*Magnesium Chloride Fixing Bath.* Since replying to you on the 18th ult., we have been trying to procure a fixing bath by the concentration of sea water. Leaving a pint of sea water to evaporate spontaneously in the open air, it is not even now sufficiently reduced in bulk to make it worth while trying the experiment of using it as a fixing bath. The liquor, besides, is so charged with black smuts from the London atmosphere that it requires to be often filtered and put back again into the cleared dish.

A. NEALE (Nottingham).—The portrait group of Council and Officers of the Society of Chemical Industry is admirable, and will serve as a most interesting memento of the Tenth Annual Meeting recently held in your town. We thank you for the blue paper print sent subsequently as an index, which enables us to identify a few faces in the group of twenty-four who were not personally known to us. We congratulate you on your success; the portraits of Sir Lowthian Bell, Mr. Ryder Cook, and the other Past Presidents—Sir John Turney, Professor Clowes, and the Mayor of Nottingham—are excellent.

J. M. S.—*The Weather of July.* The rainfall, amounting to 1·25 inches, was considerably above the average (2·51 inches), and corresponded exactly with the wet July of 1888. When not raining, the sky was so gloomy and overcast with high winds, that we doubt there was ever so unpropitious a summer month for out-door photographic operations. By the rule of compensation, August and September ought to prove more favourable.

M. G.—*Glass Clips.* We do not know where they may be procured, but with a few slips of glass, and elastic rings or sections of india-rubber tubing, it would be very easy to make them for yourself. Be sure and wash them frequently, or there would be no advantage in use over the ordinary wooden clips.

T. W. (Bexley).—*Nitrate of Lead in Printing Bath.* The addition of five grains per ounce has been recommended to help out the silver, but we cannot say with certainty that any good purpose is served by putting in the lead. A claim is made for it on the ground that the whites of the print are better preserved, but in the absence of direct comparative experiments we must not affirm that such is actually the case.

Supplement to "The Photographic News" 15th August.

Alfred Dawson Pinxit

Typo Etching Co.y Photo-Sculpsit

CHARLES KINGSLEYS HOUSE & CHURCH, EVERSLEY

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1667.—*August* 15, 1890.

CONTENTS.

THE PHOTOGRAVURE PROCESS.

WITH A PICTORIAL SUPPLEMENT.

THE highly artistic results obtainable by the photo-etching process in half tone, originated by Klic, and employed with modifications by Goupil & Co., Annan & Swan, and others, are well known. To-day we issue as a supplement a picture by this process representing the late Charles Kingsley's rectory at Eversley, reproduced in photogravure from a painting by Mr. Alfred Dawson, by Messrs. Dawson, of the Hogarth Works, Chiswick, whose excellent prints by this process of some of Mr. Gale's photographs issued with the first number of *Sun Artists* may be known to many.

At the Chiswick establishment the art-worker is Mr. Alfred Dawson, and the scientific department is under the charge of Mr. Charles Dawson. They began photo-mechanical printing in 1869 in Queen Square, Westminster, and their present works were built in 1872. The Chiswick works consist of a number of buildings dotted over a considerable space of garden ground, rich at the present time in flowers. A brick wall separates it from Hogarth's house and grounds, for which Mr. Charles Dawson is now in treaty with a view to the purchase thereof, and it is highly probable that shortly one of the most artistic and costly of the photo-mechanical processes will be carried on in Hogarth's old house. In Chiswick churchyard, near at hand, is the grave of Hogarth.

Klic's process will be found described in detail in the PHOTOGRAPHIC NEWS of January 28th, 1887. There was a previous notice of it in the NEWS of February 1st, 1884; and the first publication was made in the *Photographische Mittheilungen* of December, 1883. Briefly stated, the process consists in covering a chemically clean copper plate with finely powdered asphalt, upon which is then developed a carbon negative; both are then subjected to the action of an etching fluid, which is usually perchloride of iron. The carbon negative causes the etching fluid to act with different degrees of vigour upon parts of the copper plate, and the asphalt gives the grain. It is thus an intaglio process, and the printing is done in the same presses as those used in turning out ordinary copper-plate engravings. The machining is slow work, and it took some weeks to print the accompanying supplement.

In the photo-mechanical processes there is little or nothing of a secret nature; many beginners fail in their attempts because they do not persevere long enough to gain the great experience necessary for the production of high-class results; others fail in the machining; exceedingly perfect machines, under the control of skilled workmen, are necessary for printing proofs from plates produced by several of these processes; indeed, in some instances, the necessary machines are made in France and Germany alone.

Every firm, as might be expected, introduces some small modifications of its own into the process employed, as the result of its particular experience. Mr. Charles Dawson says that he rarely uses asphalt in working Klic's process, but a powdered compound of various resins; the bitumen grain is too fine for most purposes; it necessitates passing from stage to stage in the operations too rapidly, whereby a tendency to flatness and hardness obtains. "Pits" give trouble in Klic's process, and experience is necessary to avoid their production.

In copying paintings for the photogravure process at the Hogarth works, orthochromatic methods are employed; in fact, Obernetter's orthochromatic plates are used. As a yellow screen, a sheet of perfectly plane glass coated with solution of golden aniline in collodion is used. The golden aniline is difficult to dissolve therein, but it can be managed with time and care. When dry, another sheet of plane glass is cemented over the yellow film by means of melted Canada balsam; optical defects are thereby minimised, and the film protected. Yellow glass has usually an amber or brownish tinge, and appears somewhat dingy by transmitted light; it cuts off rather more light than is necessary for getting an equal amount of orthochromatic effect. The golden aniline film has, by transmitted light, more the pure yellow colour of a

solution of chloride of gold. At the works ordinary Ilford plates are used for copying, but all line work is copied by the wet process. Mr. Dawson states that the firm makes about four hundred photogravure plates a year.

The last Oxford and Cambridge boat race was photographed by Messrs. Dawson at 5.15 p.m., and at 9 p.m. some photogravure plates thereof were made ready for printing. By 9 o'clock next morning 500 prints were ready and on sale in London at the offices of various newspapers interested in the boat race. This is perhaps the quickest commercial work which has ever been done by Klic's slow and highly artistic process.

CHARLES KINGSLEY'S HOME AT EVERSLEY.

Our supplement this week represents the home at Eversley, Hampshire, of the late Charles Kingsley, who was so universally beloved and respected that it is unnecessary to say anything as to his writings or claims to public attention. He was born at Battramsley, in the New Forest, on the 12th of June, 1819, and died at Eversley on the 23rd of January, 1875. On July 17th, 1842, he settled as curate at Eversley, then a place described by his widow, in her book on his life and letters, as mostly a parish of common land on the borders of Old Windsor Forest, containing three hamlets surrounded by moorland, the population consisting of "croppers" and poachers from time immemorial. He once described his typical parishioner as the descendant of "many generations of broom squires and deer stealers," who occasionally spent a little time over a crank in Winchester gaol, but was "a very good fellow, nevertheless." In 1842 he described the view from Eversley Rectory thus:—"Can you understand my sketch? I am no drawer of trees, but the view is beautiful. The ground slopes upwards from the windows to a sunk fence and road, without banks or hedges, and then rises in the furze hill in the drawing, which hill is perfectly beautiful in light, and shade, and colour. Behind the acacia on the lawn you get the first glimpse of the fir-forests and moors, of which five-sixths of my parish consist. Those delicious self-sown firs! Every step I wander they whisper to me of you, the delicious past melting into the more delicious future. 'What has been shall be,' they say." Mrs. Kingsley remarks:—"Outside the pastoral work, and yet as part of it, his aim was to be 'all things to all men.' He could swing a flail with the threshers in the barn, turn his swathe with the mowers in the meadow, pitch hay with the haymakers in the pasture. He knew every fox-earth on the moor, the 'reedy hover' of the pike, the still hole where the chub lay, and had always a kindly word for the huntsman or the old poacher. With the farmer he could discuss the rotation of crops, with the labourer his hedging and ditching; and in giving sympathy he gained power."

The London and Provincial Photographic Association.—Subject, August 21st, "Cloud Negatives"; opened by Mr. J. S. Teape. Subject, August 28th, "Pictorial Definition"; opened by Mr. P. Everett. Visitors invited. R. P. Drage, hon. sec.

PHOTOGRAPHIC TOURISTS AND THE CHANNEL PASSAGES.

II.

The Folkestone-Boulogne route is perhaps the most fashionable one to the Continent, and the boats traverse the Channel from pier-head to pier-head in about an hour and a-half; although this is about twenty minutes longer than the time taken by the Dover-Calais boats, nearly thirty miles of railway travelling in France are saved by taking the Folkestone-Boulogne route to Paris. The boat trains from Calais to Paris all pass through Boulogne-sur-Mer.

Both Folkestone and Boulogne are picturesque places, affording suitable opportunities for camera work. One advantage of Folkestone as a seaside resort is, that unlike many watering places on the South Coast near London, it has no chalk cliffs, so that in the dog-days, while the sun is blinding and baking the visitor on the one side, he does not have white cliffs reflecting the sun's rays down upon him on the other side. The dark, precipitous cliffs to the east of Folkestone harbour are of soft material, and portions fall into the sea occasionally; the dark cliffs to the west of the harbour are partly covered with herbage and small trees. The departures and arrivals of the Boulogne boats present animated scenes for photographic work, so also do fishing smacks entering and leaving the harbour, and from the south side of the harbour views may be obtained of the cliffs, and old houses on the tops thereof, with boats in the foreground. To the north of Folkestone, stretching away to Canterbury, lies what may be called the Ingoldsby country, containing occasional picturesque "bits" for the camera, and some of the old village churches in the district have an interesting history of their own.

The old part of Folkestone is interesting, and abounds in the smuggling dens of the past; some of the smugglers of the old school are still living in Folkestone, and several of them tell tough yarns, which lose nothing in force or incident with lapse of time. Folkestone is a place not much invaded by excursion trains, and altogether, it is one of the most pleasant seaside places near London—although on points like these tastes differ. At Folkestone there is a slow motion of the beach from west to east, tending to choke the water area of any harbour there with shingle, and special engineering devices have been adopted at Folkestone to arrest or divert this motion, that the shingle may do little harm in the manner just stated. In 1635, in the days of Charles I., the corporation of Folkestone ordered that on the blowing of the horn "every householder," or his deputy, "provided with shovelles, or other fittinge and meete tooles," should set to work to clear the shingle out of the harbour so long as the Mayor might deem necessary, or, in default, should pay a fine of sixpence. The horn used in those primitive times by the town crier is now suspended behind the Mayor's chair in the Council Chamber at Folkestone.

The chief passenger steamboats on this service are

the *Albert Victor*, the *Louise Dagmar*, and the *Princess Beatrice*. The two former are each 250 feet long, 29 feet beam, 15 feet depth, 350 nominal horse power, and 8 feet draught; they were built by Samuda Brothers, and engined by Mr. William Penn, of Greenwich. The *Mary Beatrice*, one of the fastest steamboats afloat, is 255 feet long, 29 feet broad, 15 feet 6 inches depth of hold, 8 feet 1 inch draught, 1,063 tons burden, and 2,800 indicated horse-power; she was built by Samuda Brothers, and engined by John Penn and Sons. Her boiler pressure is 32 lbs., her cylinders 72 inches in diameter, the pistons have 5 feet stroke, and there are 6,500 feet of condenser surface, with two engines to drive the water through. The three boats already mentioned are much alike, and, small as they necessarily are because of the shallow harbours in the narrow portions of the Channel, are so well built that they would be likely to do well in very bad weather. If, however, the weather gets so bad as to be dangerous the boats stop running for the day, in order not to expose the passengers to risks. The roomy deck saloon is a special feature of these boats. The engines are of the ordinary oscillating description.

In mid-channel, by this route, the Varne lightship is seen in the distance to the west, but not near enough to get an effective photograph thereof. These lightships are exceedingly safe, although they often have to bear the full brunt of Atlantic storms; on rare occasions they have broken from their moorings in bad weather, but they are so well built that practically the men on board are as safe as upon dry land. A Trinity House boat visits them occasionally with provisions and stores.

Boulogne-sur-Mer is a pretty place as seen from the sea, and a few photographs of it may be taken with advantage. Prominent is the dome of the cathedral on the top of the hill; two long piers of timber painted white and stretching out to sea, have a waterway between them which forms the entrance to the harbour; in front of the piers the observer upon the deck of the ship may sometimes see one or more of the Dutch pneumatic dredging boats of Messrs. Volker and Bós, with appliances for drawing up the sand and stones from the sea bed by suction, and discharging them into barges alongside.

The arrival of the Boulogne boat forms a subject for pictures often given in newspapers, and will equally well suit the photographer. The sea-side scenery and cliffs of Boulogne are pretty, and, as the sea-shore faces the west, glorious sunsets at sea are sometimes visible. The cathedral, inside and outside, is picturesque. Occasionally there are some grand ecclesiastical processions at Boulogne, affording subjects for the camera unobtainable in England. One of these processions takes place on the day of the "first communion" of children. The venerable archbishop brings up the rear, upraising his hands at times and "blessing little children." The other annual display of ecclesiastical pageantry is connected with ceremony peculiar to Boulogne, known as "the blessing of the sea."

VARNISHING.

"I NEVER trouble to varnish my negatives," is a statement more often made by the amateur than by the professional photographer, for the latter is careful, by every precaution, to give permanence to his work. He never knows how valuable a negative may prove to him in after years, when, perchance, the original has gone over to the majority, and loving friends want duplicates of the picture. With the amateur it is different. He takes his negative, and, after a few positives have been printed from it for his album and that of his friends, he ceases to take much further interest in it, and it is either broken by careless handling, or stored away to be forgotten.

In wet plate days the unvarnished film, although more sensitive to mechanical injury, was of a far more permanent character, and suffered no change if it were kept with reasonable care. But that which is formed of gelatine, although much harder to the touch, is subject to change by even a moist atmosphere, and, as this is the common condition of the air in these islands, the worker should do his best to render his negatives proof against it. The varnish, in fact, acts as a moisture-proof coating, and keeps the enemy out; but, as all photographers know, it will not protect the film against actual wet, such as rain-drops, which will, if left to themselves, soon act upon the gelatine underneath.

Strange to say, the principal reason why varnishing is neglected is because the large majority of amateur workers find a difficulty in performing the simple operation of applying the fluid to the face of the negative. They try once or twice, and, after finding that the sticky liquid will somehow run over their fingers in preference to the plate, they give up the matter in disgust, and vote it a bore. The operation certainly requires a steady hand; but, beyond this, varnishing presents no difficulty whatever, if it be done while the negative is fresh from the drying rack. What we mean is this; if the negative to be treated has been handled to any great extent, the surface becomes repellent to the varnish, and it is difficult to make it flow regularly over the surface. Some persons cannot handle anything without leaving a perceptible trace of their fingers upon the thing touched, and even those who are blessed with those dry and extra-sensitive finger-tips which distinguish artists and other skilled workers, will leave an imperceptible trace which the flowing wave of varnish will discover. All difficulty disappears if the plate be handled by its edges only, and if it be varnished as soon as it is perfectly dry.

Few men care to compound their own varnish, for that which is sold by the dealers answers every purpose. But for all practical purposes the ordinary "white hard," which is obtainable at any good oil and colour warehouse, if diluted with about half its bulk of methylated spirit, can be recommended. It lends itself readily to the retouching pencil after treatment with the usual media, and it forms a good protection to the film. In the case of a negative from which an unusually large number of prints may be required, it is

as well to flood the film with a coating of plain collodion as a preliminary step, but for ordinary work the varnish is sufficient by itself.

Apart from the mechanical business of pouring the varnish on the film, some workers make a muddle of the after-work of heating and drying, and get streaky marks which show in the printing. Others, again, get dust, hairs, and all other abominations upon the varnish, and these are sure to stick in some place where they can make themselves evident in the print. With care all these disasters may be easily avoided. In the first place, the plate must be made gently warm only, by which we mean a warmth which, in the case of a liquid, would be called tepid. Next, after the varnish is poured on, the surplus should be run off into a separate bottle kept for the purpose, and finally, the plate should be rocked as it is made quite hot before a clear fire, or, better still, a vertical gas stove. All these operations should be conducted with an entire absence of hurry, for there is no need of haste; indeed, the slower the operation, the greater will be the evaporation of the solvents, and the better the coating. We believe that this old and well-tried method of varnishing a plate is the best, although it involves some little trouble; the heat hardening the coating so thoroughly that it can be printed from as soon as the plate is cold, which is hardly the case where a varnish is employed which requires no heat in its application. Several of these have been introduced of late months, and they will be productive of good if only they induce those who did not varnish their negatives to amend their ways. We have tried more than one formula for a varnish of this latter description, and the one with which we succeeded best was made by dissolving an ounce and a half of gum dammar in half a pint of good benzole. The mixture must be shaken at intervals until the gum is dissolved, and must be left until all sediment has subsided. It can then be carefully decanted for use. We give this recipe for those who like to try it, but we repeat that we prefer, in our own practice, a varnish which requires heat in its application.

Rules for Amateur Photographers.—A great deal is said about the amateur photographer that might just as well have been left unsaid. Those who never were amateur photographers do not realise that there is anything to it but pull the string and press the button. They do not know how it feels to sneak through the streets with a camera under one arm, and encounter the suspicious gaze of every man, woman, and child who knows that such a thing as photography exists. There is nobody who gets within sight of an instantaneous machine who does not promptly reach the conclusion that he is to be made the victim of a photographic conspiracy. Sometimes this self-selected victim will stand around in an effort to look pretty, and make it as pleasant for the picture-taker as possible, and sometimes he will issue a peremptory challenge to mortal combat. You never can tell. After the photograph is obtained, it is as likely as not that the houses will look like Chinese pagodas in a horrible whirl of dissipation, while the pictures of your friends make you sorry that they are not your enemies. There are lots of rules that go with amateur photography, but the only truly reliable way to deal with a camera is to take it out somewhere and carefully break it.—*Washington Post.*

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

French Photographic Society: Modification of its Statutes—New Instantaneous Shutter—Models of Moessard's Cylindrograph — Imitation Limoges Enamel—Yellow Fog, by M. Metreux—South-West Photographic Club at Lyons: Preparation for a Competitive Exhibition — General Syndicate of Photography — Consideration of the Question of Property in Photographic Work—Spread of Orthochromatic Photography in France.

French Photographic Society.—The death of M. Péligot, ex-president of the French Photographic Society, has been the cause of certain modifications being made in its statutes. It has been decided that the presidential office shall not continue beyond three consecutive years. Up to the present time the office has been filled by members of the Institute. We have had successively in the presidential chair MM. Regnault, Bolard, and Péligot, all belonging to that learned association. At the present time there are amongst the members of the Photographic Society several members of the Academy of Science—MM. E. Becquerel, Janssen, Cornu, and Marey. Probably the choice for the new president will fall on one of these. M. E. Becquerel having retired from the council as an active member, and being now only an honorary member, it is not likely that he will be elected to the presidency; and it is probable that upon M. Janssen, who has presided over the International Congress of 1889, will devolve the title, of which he is so well worthy.

MM. Béza, Hausser, and Co. showed a new shutter constructed on an American plan. It is evidently a good instrument, but it is one more among such a large number that are already open to our choice. There ought to be a special exhibition of shutters, so that one might study and compare all these systems and settle upon the best. There are, however, still so many shutters being produced that it is probably better to wait awhile before thinking of organizing such an exhibition.

Commander Moessard has had cylindrographs constructed in all sizes. He has shown some of extremely limited dimensions, one truly small in itself, permitting us to execute prints up to a metre in length.

M. Schirm described a process fit, he tells us, to imitate the enamels of Limoges. It is, in fact, only a sort of transfer not capable of enduring firing, and is produced by the carbon process; nothing particularly new or interesting in this.

The question of yellow fog has been once more brought forward. M. Métreux thinks that it may be avoided by using copious washing. To think that so much should be said about such a small matter! We believe that we have shown that sufficient washing will prevent this evil, and that it is useless to theorise much about it. After this meeting the society was adjourned till the month of November.

The Photographic Club of Lyons had had the intention to prepare for the month of October a great exhibition and set of conferences, but it has recoiled before the material difficulties of such an enterprise, and has limited itself to an exhibition of prints and a competition. The present moment is not favourable to the organisation of a complete exhibition. As for the conferences, they are deferred to a later period, and doubtless there will be one at the time of recommencing the meetings. We believe

that on this occasion one of the honorary members of the Photographic Club of Lyons resident in Paris will be applied to.

The question of the protection of original photographic works continues to occupy the general syndicate of photography; its last meetings have been given over to the study of this question in connection with the projected law concerning literary and artistic property deposited by M. Philippon at the bureau of the Chamber of Deputies. This project assimilates photography to the other methods of production of works of art. It seems to us difficult to suppose that it will not be adopted, and it would be really dangerous to create an exceptional law with regard to photography.

Orthochromatic photography is spreading more and more in France; plates from the establishments of Monckhoven at Ghent, of Engel and Feitknecht in Switzerland, and others, are on sale everywhere. At the establishment of MM. Poulenc Brothers, and at other warehouses, pellicular colour screens, sensitocolorimeters, and chemicals for sensitising plates by the bath process are now on sale. The house of Lumière is also preparing, we hear, to supply orthochromatic plates. All this is of good augury, for the day is not distant when the use of these plates will be insisted upon for the reproduction of polychromatic subjects. We shall then be surprised that we have waited so long before making use of a process that enables us to reproduce the value of diverse colourations with their true effect.

THE TREATMENT OF SUBJECTS BY FOCUS.

BY THOMAS R. DALLMEYER.

Spherical Aberration.

In this paper I shall confine myself to answering Mr. Burton's comments on spherical aberration. He makes this the *pièce de résistance* of his letter, and I therefore propose to settle this question first. To make the matter clear, I would invite those who are interested in the question to refer to Mr. Burton's paper and the two diagrams therein.* First, he says I say that "in the case of a lens with diffusion of focus introduced in the form of positive spherical aberration, the effect, if a middle distance object is focussed, is that the falling off in definition, although greater for a near object than in the case of a thoroughly corrected lens, is less for the distance, and that, the important aim being to reduce the contrast between the definition of the object focussed for and that of the distance, diffusion of focus is a useful thing." Mr. Burton says in reply to this, "that the facts are *the direct opposite of this.* Positive spherical aberration favours near objects at the expense of distance," and proceeds to say that he thinks he can prove it.

Now as a matter of fact, the diagram of Grubb is not properly disposed for accurate comparison, in that the point of best definition does not lie in the plane of the least circle of aberration, *but beyond it:* but it will suffice for the purpose. If, as I have stated before, the sole measurement that concerned the practical as well as theoretical introduction of spherical aberration into a lens was to be ganged by the *transversal measurement* of the circles of confusion, then it would be found that the planes nearer than that focussed for would be benefitted by the introduction to the detriment of the distance, as the transversal measurements shown in the diagram would convey to a casual observer.

Taking Grubb's diagram as it stands, there is a locus of five hundred units, within which there is partial definition and an *inward* concentration of rays even beyond this in the lens containing spherical aberration. In the corrected lens there is only one point of absolute definition, and a uniform distribution either side of the focus; in the lens with spherical aberration, therefore, there must be *improved* definition in these out of focus planes along that locus, and where there is the inward concentration. The most important bearing that the introduction of spherical aberration has on the formation of the image *depends on where the image-forming rays are most concentrated.* Imagine, in both cases, that a point of light has been focussed for. A mere glance at the lower figure shows the vast amount of inward concentration that occurs on the *further side* of the least circle of aberration; it is the *inward* concentration of rays that tends to form the image. Mr. Burton, simply taking into consideration transversal measurement, entirely overlooks the fact that although the transversal measurement *is less nearer to the lens, that here the concentration is outward*, and the point of light that is desired to be represented would be represented by a bright ring with a comparatively dark centre. On the further side of the best focus it will be a bright point surrounded by faint halos, but, comparing the two, the inward concentration of these image-forming rays where concentrated along the axis will produce a *better* image than an uniformly illuminated disc. When spherical aberration is introduced, I repeat, the distance is favoured at the expense of worse definition for the foreground. If Mr. Burton had carefully examined the prints of the grating in my paper read at the Camera Club Conference, he would find, in the case of excessive spherical aberration, the *tendency* I have pointed out of *outward concentration* is clearly illustrated, in that for a nearer plane than that focussed for the image itself becomes absolutely *reversed*, whereas the distance simply, more or less, maintains the *structure* without the reversal.

The second error in Mr. Burton's letter is where he says:—"Mr. Dallmeyer assumes that the bundle of rays nearer the lens than the plane of focus represents the distance, those farther from the plane of focus, foreground. *Now the exact reverse is the truth.*" I find this rather comical, as Mr. Burton immediately proceeds unwittingly to prove by his diagram that I am right and he is wrong. The plane of the plate, A B, is a fixture, and is focussed for an object, C. Viewing the two diagrams of Grubb and this together, supposing the object is moved nearer to the lens at E; the result is, that upon the plane of the plate the *outward* concentration of rays will fall; if, on the other hand, the object C be moved away from the lens, for parallel rays, as represented in Mr. Burton's figure by the fine lines, the *inward* concentration of rays will fall upon the plate. Had Mr. Burton introduced spherical aberration into a large diagram, he would have seen that what I have above pointed out is fact. I say it is comical because Mr. Burton becomes so hopelessly muddled that he does not see that if he puts his *two* clauses, "the exact reverse of this is the case," together, that the two negatives make a positive, and, if correct, would prove that, with positive spherical aberration present, the *distance must be favoured.*

In order that I may make myself perfectly clear, I would like Mr. Burton to try the practical experiment for him-

* We are unable to reprint this week the two large cuts published in the News last week, and referred to in this article by Mr. Dallmeyer. Readers are therefore requested to refer to our last number.—Ed.

self. Taking a lens with a large amount of spherical aberration outstanding (for simplicity), and obtain the best focus possible; then, referring to Grubb's diagram, with the spherical aberration outstanding, let him remove the bright object, such as a lamp flame, some distance off without altering the plane of the focussing screen. He will there see that the continuation of the *inward concentration* of the image-forming rays is brought forward and registered on the plate, the image still, according to the distance to which it has been moved, remaining more or less distinct. Then, on the other hand, let the lamp be brought forward without altering the plane of the focussing screen; he will there see that, instead of having the same indication of the image, the rays going to form a focus at a *longer* conjugate, the *outward* concentrated rays will fall upon the screen. If, in any case, Mr. Burton cannot follow my arguments, let him, at any rate, prove this for himself by the experiment; he will then be convinced of the truth of the position I have taken up.

In conclusion, Mr. Burton says that he does not know at all that he agrees with me when I lay it down that it is always most desirable to reduce the lack of definition of the *distance* without reference to the foreground; then he says, "I think there are many cases in which the reverse is the case." My reason for thinking that improved background is better than improved foreground is, that as visually there is less falling off in discrimination of distance *beyond* what the eye is concentrated upon than there is for foreground, that this condition is preferable; for we know in vision that there is a distance beyond which everything is apparently in focus; and Mr. Burton also possibly knows, for a given distance either one side or the other of the plane focussed for, the definition would be better for an object a certain given distance *beyond* the point focussed for, than for the like distance in *front* of the point, even when employing a perfectly corrected lens.

In my paper read before the Camera Club Conference, I mentioned that there was a means of improving foreground, if necessary, by the introduction of *negative* spherical aberration; and if Mr. Grubb's diagram be turned upside down, Mr. Burton will have the representation of the condition of things if negative spherical aberration were introduced.

Had this subject not been fully thought out many years ago, there is no doubt, in my late father's patent portrait lens, there would have been a means by bringing the back flint lens *closer* to the crown than the condition for aplanatism now allows of to introduce negative as well as positive spherical aberration. With that construction either the one or the other class of aberration could be introduced at will, there being one definite position in which the lens as a system is entirely free from aberration.

I hope next week to reply to the other points contained in Mr. Burton's letter.

Photographic Club.—Subject for discussion Wednesday, August 20, "Photometers and Actinometers." August 27, "Printing Through Coloured Media."

A Simple Printing-Frame.—*Photographisches Wochenblatt* gives the following directions for making a cheap printing-frame; viz., take any old or spoiled glass negative of the proper size, and cut it in two; then paste a strong piece of black muslin over both pieces; when thoroughly dry this will form a hinge. For use, place the sensitive paper on the negative to be copied in the usual manner, then a piece of blotting-paper, after which lay the cut negative, muslin side up, on the paper, and secure the whole with four spring clips or clothes-pins, and print in the usual manner. This device has been published before.

THE PHOTOGRAPHER'S HOLIDAY.

BY JAMES MEW.

"To everything," says the author of the book known as "Ecclesiastes," "there is a season, and a time to every purpose under heaven." To every separate work which goes to make up the great aggregate of human activity, to every operation in the vast sum of human travail, there is, according to this inspired authority, an appropriate time appointed.

The time to take a holiday seems, by a general consensus of opinion among the inhabitants of Great Britain, to be the month of August. It is in this month that everybody—everybody, at least, in the social world of fashion—is out of town. It is in this month that we hear the familiar observation, however inaccurate, that the streets of London are nearly empty.

It is in this month that a drizzling shower of advertisements from the various railway companies in England invites us to Blackpool, and to Leicester, and to the Lakes, and to Margate, and to Southend-by-the-Sea, and to more places of holiday resort than could be easily compressed into a column of the present paper in the smallest type.

It is in this month that the modern development of Virgil's harpies swoop down upon the carefully provided fodder of the family commissariat, and confound her frugal mind with large slices cut out of the cold leg of mutton intended for the Sunday dinner. Finally, it is in this month that the photographer is bound by laws akin to those of the Medes and Persians in their immutability, to take his holiday, if he can take a holiday at all. And here arises a painful doubt, Can a photographer take a holiday at all?

First, let us take the case of the ordinary man of photographic business, with whose neat glass case in the High Street—a case full of portraits of the seven ages—we are all so familiar. This bourgeois photographer will take up his parable, and complain in this wise after the fashion of Sterne's starling: I can't get out. I cannot take a holiday. If I leave my wonted habitation, what will become of my custom? Those who seek me will not find me. They will go elsewhere; there will they obtain their hearts' desire, and I shall be altogether forgotten like a thing out of mind. Thus he complains, and not altogether without cause. It is idle to suppose that his customers will reason in the following syllogistic fashion, neatly provided for them by the inexperienced: Our photographer, from extreme pressure of work, has lost his health, and has been compelled to recover it by a little change. This extreme pressure is the result of his popularity; his popularity, again, is the result of his excellent workmanship. Therefore we will wait to have our portraits taken till such time as he returns. No! human nature, particularly, perhaps, female human nature, which pants after carte-de-visites as the hart panteth after the waterbrook, is impatient; it is also illogical. An idea of business, and of a consequently failing health, does not arise in the lady visitor's mind before her favourite photographer's closed door. She is rather disposed, from the little irritation born of disappointment, to associate his absence with indolence or with pleasure. In any case, the lady visitor cannot waste her valuable time; she cannot wait. Human nature, it has been said, seeks to attain the difficult, but that is only where the easy is impossible of access. There is no aspiration for the attainment of the difficult where it is simply a matter of crossing the road from Mr. Jones, on his holiday, to Mr. Brown, still hard at work

in his studio. Bob Sawyer's device to obtain patients was not destitute of ingenuity, but it is also probable that he lost them by his absence from his surgery.

Let us hear the conclusion of the whole matter. The ordinary photographer—the man whose business it is to furnish counterfeit presentments of his fellow creatures all day long—can hardly take a holiday without a considerable loss of custom. This is a misfortune which, it may be urged, he shares with every other professioual man; but it is hardly so. The lawyer, for instance, loses little by not attending to legal business in the long vacatiou; the grocer may leave a substitute behind him. The photographic artist has in this particular an unique crown of exclusive glory. But if Mr. Jones is willing to behold with uo jaundiced eye those who once purchased their pictures from him passing over the road with one accord to buy of Mr. Brown; if in the magnauimity engendered of the Margate air he chooses to let pecuniary considerations slide, then let Mr. Jones take holiday to his heart's content. He may sit in the blinding sunlight upon some unfamiliar shore, and do nothing but contemplate the sea all day long—a leading feature of happiness in a holiday—if he is content to forget his camera, which is not so difficult, and his customers, which is not so easy.

But a real photographer, a true lover of his art, one whose soul is occupied with his profession, a photographer *jusq'aux ongles*, as the French say, a man whose whole being, as we say, is in his work, can a man of this kidney ever obtain what is generally and correctly understood by a holiday. The old sense of this word, which is a consecrated day or a religious anniversary, a day set apart for the commemoration of some important event or egregious person, has long since passed by. Its meaning is now not necessarily even au occasion of joy and gaiety. It is rather a time of exemption from labour, a time comprehending a day, or a number of days, during which a person is released from his ordinary toil. It is in this sense in which the word is used in the well-known passage which Shakespeare puts into the mouth of Prince Henry:—

> "If all the year were playing holidays,
> To sport would be as tedious as to work."

The never failing condition of a holiday is that there must be some variation of a man's common occupatiou.

The essence of a holiday is change. For the true photographer this condition is difficult, if not impossible. He who practices photography solely for the sake of making money by it may be no true lover of the art. It is easy for him to obtain his holiday by leaviug all photographic considerations behind him. But he who loves his art for its own sake, for the pleasure which it brings him, quite apart from any consideration of pecuuiary profit, cannot so easily divorce himself from its charms. Before the commencement of what is called, for convenience of nomenclature rather thau for exactitude of description, his holiday, he will earnestly consider what photographic impedimenta it will be necessary or conveuient for him to pack up and take with him, constant companions wherever he goes, like the bells on the fiugers and bells ou the toes of the lady in the nursery rhyme. His study will be to simplify his baggage, to take such articles as are light and yet of approved solidity, such pieces of photographic machinery as are proof against heat and moisture. Then comes the choice of plates, of objectives, of chemicals; then a selection from a series of excellently well written papers from the Photographic News on the arts of retouching, of printing, on the possibility of the reproduction of natural colours, all of them papers which he has put aside to read carefully at a convenient season. These he reads, or some one or two of them, as the train conveys him to the haven where he would be, the place he has chosen to inhabit during his so-called holiday, and so his so-called holiday begins.

With such a commencement of his holiday, it is possibly needless to enlarge upon the method of its continuauce. The recreation which arises from change of employment is not his. He alters—perhaps not without some considerable inconvenience, paying all the while heavily for the alteration—his hours of rising aud going to bed, of exercise, of eating and of drinking. He varies his meals, but not his meditations. Photography, which is the great business of his life at home, is also the great business of his life abroad. The unwonted dress of the foreigners he meets fills him with a burning desire for the Kodak he forgot to pack up and bring with him in his portmanteau. The most picturesque scenery of hill, or champaign, or wood, or waterfall, in dewy morn or dusky eve, scenery which is supposed, in the slang jargon of our day, to lift a man out of himself, only plunges him into a troubled consideration of lenses, and lights, and sensitised papers, and diaphragms, and printing, and toning, and filters, and oxalates, and hyposulphites, aud the uumerous other matters which enter the ordinary routiue of the photographer's existence. The Chinese, who, as we are told, object to having their portraits taken lest they should at the same time lose a portion of their soul, are uot, perhaps, so silly in their apprehensious as they might at first blush appear. If the soul of the sitter suffers not from the taking a portrait of the whole or a part of his body, the art which instructs the photographer to take him is guilty of no petty larceuy in the matter of the soul of the photographer himself. You have robbed me of my soul, is the intelligible though impassioned language of the lover to his mistress. In like manner may the fervid photographer arraign that dear art which is his constant occupation as well as his dearest delight.

The lawyer may forget for a season his parchment and his leading cases, the churchman his Chillingworth and his chasuble, the doctor his drugs and his drachms, but the photographer to the manner born is reminded by his very pleasure of his well-beloved business. It is impossible for him to escape from his camera.

In their daily work, people become tired of repetition, of routine, of sameuess. They know their work so well; there is nothing to surprise them; they can reckon so exactly on what is coming. They get tired of it all, and wish for something varied, something unknown, something unusual, somethiug surprising. This is the chief factor in the sense of delight alike for the holiday maker in Lucerne or the Lakes, and the urchin who plays at pitch and toss in the street with a dirty halfpenny; and so far as the photographer here pictured can obtain pleasure from unexpected effects, so far he may enjoy a holiday without locomotive change. But other holiday it is not his to know. Like the merchaut Abudah in the Tales of the Genii, the wealthy tradesmau of Bagdad who, travelling in search of the talisman of Oromanes, was accompanied everywhere by the mysterious box containing a familiar spirit, so is the lover of his art accompanied in his search after health or pleasure abroad by the ubiquitous presence of the spirit of photography, which at home is his household god.

Notes.

M. Nadar has been inviting newspaper men and others in Paris to become amateur burglars, and to try their prentice hands at breaking or filing open his iron safe. At a certain stage these operations complete the circuit of a galvanic battery, which then fires off some magnesium explosive powder, and releases the shutter of a concealed camera. The result of this is a portrait of the burglar in the act of "burgling." The correspondent of one French newspaper says that he was careful to bring his portrait, so taken, away with him; it was too compromising to be left out of his own possession.

The people of the more civilised nations of Continental Europe have been visiting each other more and more in holiday seasons for the last twenty or thirty years; but only of late years has the average Briton begun to take the same course. The small extent to which the teaching of living languages was aforetime encouraged by British scholastic authorities had much to do with this comparative isolation. Within the last six or seven years a remarkable change has been taking place in the amount of Continental travel performed by the English middle classes, and the statistics of the traffic across the Channel just published show that during July the number of passengers between Calais and Dover was 28,207; between Dieppe and Newhaven, 13,631; and between Boulogne and Folkestone, 8,757. The traffic for the first seven months has amounted to—Calais and Dover, 141,333; Dieppe and Newhaven, 47,217; Boulogne and Folkestone, 44,251. The total of these figures shows a decrease of 67,252 compared with last year, which was an exceptional year on account of the Exhibition; but, in comparison with 1888, there is an increase of 18,392 passengers.

Now that the question of the revival of stereoscopic photography is occasionally cropping up, some of the leading causes of its going out in the past may be considered. One was the large number of bad stereoscopes in the market, unprovided also with means for adjusting the lenses to suit the eyes of different observers; the eyes of some persons, for instance, are much farther apart than the eyes of others. The lenses of a stereoscope should be adjustable to any position, in addition to the usual means of fixing them at any desired distance from the photograph. Badly mounted stereoscopic views were plentiful, and those which were printed on albumen and imperfectly fixed, tinted also with fugitive colours, soon became wretched objects on a drawing-room table.

An idle rumour has reached us from different sources that a shop for the sale of photographic goods is to be opened on the ground floor of the new premises of the Camera Club, not that the Club is going to keep the shop itself, but that it will let the "location" to some dealer. This would come pretty much to the same thing, because shops in main London thoroughfares are commonly enough let at rather more rent than the tenant can pay, so that actually he is often but the slave of his landlord. Supposing, however, that the ground floor were let at a moderate rental, the tenant—and we have not heard that one has been unwise enough to accept the ticklish position—would be obliged to be mightily civil to his governing customers upstairs, and the latter are aware that there are two ways of controlling a donkey. One way is to beat him with a stick, or, when a lady is on his back, to run hairpins into him between the ribs, because that method does not look so cruel as the use of a cudgel, and might not be noticed by passing observers; the other way is to hold at the end of a stick a bunch of carrots in front of his nose. Whichever way you put it, the fact remains that the animal is not free, and that the governing powers are the morally responsible agents. If the Royal Society tolerated a shop on its premises at Burlington House for the sale of scientific instruments, or if the Travellers' Club encouraged a map-shop down below, what effect would it have on the influence and *prestige* of the organisation? Such a line of action as that rumoured would seem to us at the first glance to be the first mistake in public policy yet made by the Camera Club, an excellent organisation which has greatly promoted intellectual activity in photography. Probably the rumour is false.

Many of our readers have, doubtless, been somewhat amused by the highly coloured pictures of sea-side places and tourist resorts which are exhibited by our various railway companies. The lines which run to Scotland are particularly demonstrative in this way, and, in spite of stern reality, depict mountain and lake bathed in everlasting sunshine, as if in those regions the rainfall, instead of being in the nature of things more abundant than in any other part of Britain, were absolutely *nil*. In like manner the Lakes of Killarney and the western coast of Ireland are made to tell a flattering tale of continued fine weather. Of course the railway companies must not be blamed for showing their territory under the best conditions, and fine weather landscapes will, no doubt, continue to attract customers.

But some railway companies seem to be alive to the fact that these pictures may be thought by some to be too gorgeous in their colouring, and to approach too nearly to the pictorial efforts of the theatrical manager. So they are invoking the aid of photography in their efforts to gather tourists under their wings, and they are wise in exhibiting pictures of real merit. In the first class carriages of the Great Eastern Company, for instance, are now displayed some capital pictures of the Norfolk Broads, &c., which bear the well-known name of Payne Jennings. The Midland Railway is also to the fore in showing at their stations some good pictures of the magnificent limestone scenery of Yorkshire. These latter are platinotypes, and are evidently meant to stay.

A notable result of the adoption of photography by the tourist is the large number of dark rooms which are now at his disposal throughout the kingdom. Dealers have long ago seen the advantage of providing this accommodation for their customers, the enterprising London Stereoscopic Company having been first in the field. In every large town there are several who allow tourists to change plates on their premises, and even to develop as well. This, of course, brings them business, for the worker is sure to want both plates and chemicals to supply the place of those which he has used up, and will often make a point of wanting something in order to make a little return for the hospitality which he has received.

But, beyond mere dealers, there are others who are glad to place the attraction of a dark room before their customers. These are the hotel keepers, who are beginning to understand why so many of their clients have from time to time made enquiries as to the accessibility of their empty cellars. In a very useful hand-book issued for the use of members of the Cyclist's Touring Club, such hotels as afford this accommodation have the letters D.R. (dark room) or D.C. (dark cupboard) placed against them. An explanatory note says that some of these places are mere cupboards, without any kind of fittings, and the tourist is therefore advised to carry his own red light with him. In the near future the hotel proprietor will find it to his interest to pay particular attention to this necessary adjunct to his house.

Our own Post Office authorities are occasionally afflicted with eccentricity; but they have not, so far as we know, perpetrated such an enormity as a well-known French photographer, M. Balagny, complains of. M. Balagny had sent to him, from America, a number of film negatives for development. They were forwarded by parcels post with all possible precautions, and marked "Photographic plates; to be opened only in a red light," but seem to have met with a series of misfortunes. Firstly, they took two months to arrive; secondly, the postage amounted to eight francs, seventy-five centimes; and thirdly, the packet had been opened and all the plates spoilt. A second parcel of films, marked "Sample of photographic pellicles, of no value," arrived to time, cost but thirty centimes, and developed without the least sign of deterioration. After this experience, M. Balagny has come to the conclusion that the best way of sending photographic films is in the form of a registered letter, with a declaration of its value.

The incident certainly points a moral. Until the Post Office authorities employ photographers, and set up dark rooms, it will be unwise to inscribe packets with the intimation, "To be opened only in a red light." Some officials might take this announcement as a direct invitation to break the paper cover, and as their notion of a red light might be very different from that of a photographer, the result would be disastrous for the contents of the parcel.

Photographers, like doctors, are perpetually differing. Perhaps it is as well; the various opinions and experiences prevent monotony. The paper on "Eiconogen," read by Mr. Chapman Jones recently at the Photographic Society of Great Britain, has attracted the attention of the Society Francaise de Photographie. M. Davanne does not concur in Mr. Chapman Jones' opinion that eiconogen does not stain. M. Davanne's experience was that eiconogen did stain, but he added that the cause might be due to the developer having been prepared for some time. M. Ton, on the other hand, did not think the staining was due to the developer at all, but to the difference in the mode of preparing the plates.

There are no less than three pirated photographic editions of the "Encyclopædia Britannica" selling in the United States at about one-seventh of the price of the authorised edition. The decision in the recent action brought by Messrs. A. and C. Black and their American agents, Messrs. Scribner, against an American firm which had published a pirated edition from photographic plates, will probably cause the other three firms some alarm, as a verdict against them is certain should Messrs. Black decide to proceed for damages.

France and America are running a very close race in regard to photo-astronomical work. The Brothers Henry have lately turned their attention to photographing stella spectra, and with such success that from statements made by Admiral Mouchez in a report to the Paris Academy, it appears that their results compare favourably with those obtained in the United States. The photographs were obtained by placing prisms of 22° or 45° in front of the object glass of the photographic telescope. The Paris Observatory, Admiral Mouchez also stated, will henceforth include spectroscopic observations as a part of its regular work.

Are the public getting tired of photographs of celebrities? There is a decided falling off in the demand. One photographic firm which used to go in largely for this branch of publication now attaches no value to it as a source of income. A well-known shop, not a hundred miles from Temple Bar, which for years was exceedingly useful to artists in want of photographs of celebrities, is closed; and it may be presumed that there was no inducement for a successor to continue the business. The Automatic Photographic Supply Company has discovered that there is not the fascination in photographs of actors and actresses, even at a penny a piece, 'as it supposed. And as for the peripatetic vendors, they have almost wholly disappeared from the streets, though this, of course, may be due to the fact that in the summer time they may have more profitable articles of merchandise. Anyway, all the indications point to a curious cessation of interest in the counterfeit presentments of popular personages.

THE AMERICAN PHOTOGRAPHIC CONVENTION.

At the American Photographic Convention, which opened in Washington three days ago, the list of prizes for 1890 is as follows:—

The grand prize is a group in bronze, entitled "Nearing the Goal," value $225, and governed by the following rules and regulations:—

Competitors for this award shall exhibit three plain photographs illustrating Tennyson's poem, "Enoch Arden," the picture not to be less than 13 or more than 22 inches in length.

The pictures must be framed, either with or without glass. The award to be made for the most meritorious collection.

Class A.—A beautiful silver "plaque" mounted in plush, representing "Victory," for the best exhibit of genre photographs. The subjects are to be chosen by the photographer, and appropriately inscribed; size not less than 13 or more than 22 inches in length, and framed, with or without glass. The award to be made for the best collection.

Class B.—One gold, one silver, and one bronze medal for the best collection of portrait photographs, size 14 by 17 inches, or larger.

Class C.—One gold, one silver, and one bronze medal for the best collection of portrait photographs, size 11 by 14 inches, or smaller.

Class D.—One gold, one silver, and one bronze medal for the best collection of landscape photographs; one silver and one bronze medal for the best collection of marine views; one silver and one bronze medal for the best collection of architectural views.

Class E.—One silver and one bronze medal for the six most artistically retouched negatives, any size; prints made before and after retouching to be exhibited with the negatives.

Class F.—One silver and one bronze medal for the six best plain enlargements, either in silver, bromide, albumen, carbon, or platinum, size not less than 18 by 22 inches.

Class G.—One silver medal for the best improvement in photographic appliances introduced since the last Convention.

Class H.—One gold, one silver, and one bronze medal for the best foreign exhibits of portrait photographs, framed or unframed, but delivered to the Association free from all charges.

Mr. R. P. Drage is the new hon. secretary of the London and Provincial Photographic Association. The life and soul of any organisation have no means of adequate public expression except by means of its secretary, and we think, as aforetime, that in this case the Association has another good one.

Gelatine Plates Developed in Water.—Dr. Backelandt gives the following formula for making sensitive plates which, after exposure in the camera, can be developed in water. These gelatino-bromide or gelatino-chloride of silver plates are prepared in the following manner. The back of the plate is coated with a mixture composed of:—

Water	20 c.c.
Salicylic acid	1 gramme
Gum or dextrine	10 grammes
Alcohol	5 c.c.
Pyrogallic acid	1 gramme

The plate is allowed to dry at the ordinary temperature. To develop, steep it in water to which a few drops of ammonia have been added.

THE VALUE OF SILVER WASTE.

BY GEORGE BRINTON PHILLIPS.

It is rather surprising that there should still exist in the minds of many practical photographers a good deal of uncertainty with regard to the true value of their silver and gold wastes. In the early days of the art very little attention was paid to the systematic saving of the precious metals in the waste, although Dr. Vogel, in his "Handbook of Photography," in 1871, gave some interesting estimates of the amount of silver in the finished print, and the quantity that goes to waste in the wash-water, hypo, and clippings. Of late years, however, close competition has compelled the photographer to consider his wastes as a source of revenue, and now, when the proper systematic care is exercised in saving them, but little that is valuable of the precious metals is actually lost. The writer, some years ago, made a number of experiments and assays to determine the amount of silver that went to waste during the process of silver printing. The results, which were published in a pamphlet, called attention to the very trifling amount of silver in the finished print, amounting to only about 6 per cent., and the large proportion which, with care, might be saved.

It is, perhaps, a little unfortunate that the possibility of recovering so large a percentage of the silver used has led a good many to expect to get back really more than they have actually consumed. There are some photographers who, with a laudable desire to save all their paper waste, sweep into a corner of their printing room everything that falls upon the floor, and in a short time a pile accumulates, consisting of some clippings, with a varied assortment of old newspapers, card mounts, dry-plate boxes, broken negatives, nails, and pretty much everything, down to old hats and shoes. This heap is regarded with a jealous eye as a possible mine of great wealth; when the meagre return from the refiner comes in the photographer is much disgusted, and, in his ignorance of the simple facts of the case, believes he is the victim of gross fraud. There are others who, through lack of time or interest in the matter, delegate the proper care of their wastes to some one in their employ. Of course the conscientious printer will do the best he can, if he has the proper instructions, but an intelligent supervision is always necessary in looking after the details of any business to insure success. Although it should not be the principal effort of the photographer to make the saving of his wastes the chief aim of his business, yet it is a matter which is worth a little personal attention, as he will then be able to form a pretty accurate estimate of the value of his wastes, and, having a knowledge of the amount of nitrate of silver purchased during the time, he can compare, with some degree of fairness, his expectations with the actual returns when they come in.

To do this, it is most important that the waste paper and residues should be kept clean and free from foreign matter. A barrel or large box in a convenient corner in the printing room may be made the receptacle for all clippings, proofs, and spoiled paper, and nothing else should be allowed to get in but silvered paper. Under such circumstances it will be easy to form a close approximation of the actual value of such waste. It must be borne in mind, however, that the presence of bromide paper, and especially blotters, will considerably lessen the value of the waste, while, on the other hand, many rich filters, or papers which have become saturated with the

drippings of nitrate of silver for a long period, will noticeably increase it. It has generally been conceded that 1 ounce of nitrate of silver is consumed in sensitising 20 sheets of paper. As 20 sheets of silvered paper will be found to weigh 16 ounces, or 1 lb., it follows that it will be impossible to get from a pound of such paper more than 1 ounce of nitrate of silver. Now, as 1 ounce of nitrate of silver contains 63·5 per cent. of metallic silver, the one pound of paper will contain 277 grains of metal. The value of metallic silver varies from day to day, so that the value of the waste will fluctuate in a corresponding manner. Supposing that fine silver were worth 95 cents. per ounce (the average price for some months past), the value of the 277 grains of silver would be $54\frac{8}{10}$ cents. This $54\frac{8}{10}$ cents, then, is the actual value of one pound of perfectly clean silvered paper. Of course it stands to reason that there must be some expenses and profit to the refiner in recovering the silver from the waste, which must be deducted before the net value to the photographer is reached. These expenses may be great or small, but there must be some charge for refining, and as few photographers have the time or knowledge necessary to successfully refine their own wastes, they should not begrudge the modest charge deducted from the returns.

The experience of a number of years in the reduction of silver residues has enabled the writer to verify the above figures.

Paper silvered upon a 60 grains bath has been found by careful assay to contain 11 grains of metallic silver to each sheet, five grains existing as free nitrate of silver, which is removed in the washing before toning, the balance being chloride of silver, the bulk of which is dissolved out by the hypo. As 14 grains of silver are present in one sheet of paper, twenty sheets (or one pound) would contain 280 grains, a close approximation to the theoretical calculation. In another paper will be shown the value of the wet residues, toned prints, and gold waste.—*American Journal of Photography.*

An Optical Pyrometer.—In the Official Report on War Material in the Paris Exhibition, *The Chemical Trades' Journal* finds an interesting application of optical polarimetry to the determination of high temperatures. We refer to the Lunette pyrometrique or pyrometic telescope, in which polarisation is applied to the rays of the spectrum. The instrument consists of a small tube of brass having a conical enlargement at one end. The smaller and cylindrical portion is divided into two parts, the first containing an arrangement of lenses, constituting the eye-piece, and a Nicol's prism. This is called the analyser, and is fitted to the second tube or part so as to rotate axially and independently. In the second part is fitted a plane of quartz, cut perpendicular to its optical axis. Behind this is a second Nicol's prism called the polariser, while in the enlarged end of the instrument is placed the object glass. When an incandescent body is observed through this instrument, the colour visible for a given rotation of the analyser varies according to the temperature, and the passage from one tint to another requires an angle of rotation varying according to the luminous shade observed. A small turn brings the change from green to red, and the angle of rotation indicates the temperature. The test is said to be far more accurate than any judgment based upon observation with the naked eye. Cherry red at about 900° C. requires an angle of 40° on the instrument; white heat at 1,500° C. an angle of 69° to bring about the change of colour. The small illumination produced by temperatures below 900° renders it difficult to accurately determine them, and an extra large objective is employed. It is stated that this instrument is "largely" used at the St. Jacques Works, and we await further particulars based on actual experience of this interesting application of polarised light.

SPECIAL UTILISATIONS OF HYDROQUINONE DEVELOPMENT.

BY T. ARCHDALE POPE.

Hydroquinone has not hitherto been much used as a substitute for pyrogallic acid in the development of dry plates, at least in this country; but when the advantages which it possesses over the latter substance come to be more fully recognised, it is not unlikely that, for certain classes of work, and in particular for the development of extremely rapid plates, it will supersede pyro altogether. I have lately been hunting up and trying the different published formulæ, and have found one in a book published last year (*Traité de Photographie parles Procedés Pelliculaires*, by Balagny, Vol. I.) lent me by Colonel Waterhouse, which will repay the trouble of making up. As it is not so much the composition of the developer as the method of applying it, according to the particular qualities desired in the negative, which conduces to good results, it will be necessary to describe exactly how the author himself proceeds.

The chief advantage claimed for hydroquinone is that it yields a negative of remarkable softness, and at the same time of sufficient density to give a good print; and that such negatives can be produced by means of hydroquinone much more readily than with pyro, the latter only yielding equal results if the proportions of the several ingredients of the developer—pyro, bromide of potassium, and alkali—are regulated exactly. No such extreme nicety of proportion is necessary with hydroquinone development. Once the solution is made up, it only remains to employ it in the manner to be described, and it will be almost impossible to spoil a plate, provided the exposure has been fairly correct. Moreover, the colour of hydroquinone negatives leaves nothing to be desired; yellow stains and green fog, so often resulting from pyro and ammonia development, are impossible with it, and the delicate silver-grey tone which it imparts is very conducive to rapid and successful printing.

The quantities are given by the author in the French metric system, but I have converted them into English weights and measures as being more likely to be useful to readers of the *Journal*.

The developing solution is made up as follows:—

Water	30 ounces
Sulphite of soda	2·5 ,,

When dissolved, heat the solution to about 70° Fah. and add—

Hydroquinone	150 grains

The hydroquinone should be in powder; great care should be taken that it is completely dissolved, and no grains left at the bottom of the glass; otherwise, the subsequent addition of the alkali will redden the solution slightly, and ultimately spoil it altogether. Next add—

Carbonate of soda (crystals)	4·75 ounces

which completes the developer.

This solution is so energetic in its action that it should never be used in its freshly prepared state, except to develop highly sensitive plates exposed with the most extreme rapidity. When several such plates have been developed in it the solution becomes partially charged with bromide of soda from the sensitive films, and this exercises a restraining effect upon it, rendering it slower in its action and more suitable for the development of less sensitive plates. As the solution alters very slowly, the same quantity may be used to develop five or six plates in succession, after which it should be poured off into another

bottle, and kept for future plates of a less high degree of rapidity.

But if, having made up the solution as above, it is only desired to develop plates of the slower class, to which ordinary drop-shutter or longer exposures have been given, it will be necessary to modify the developer, so as to give it the restraining effect of one which has already been used. This may be done by adding to a sufficient quantity of the unused developer an equal quantity of water, and to each ounce of the mixture three drops of glacial acetic acid.

Thus, we have two formulæ; one for a developer which is too strong in its action for ordinary plates, but can only be used in cases of very special rapidity, and another for a modified developer, which is precisely similar in its action to the stronger one when the latter has been used a few times, and become partially charged with bromide of soda. These two developers may be used either separately, the first for very quick, and the second or modified one for very slow exposures, or they may be mixed together in various proportions for exposures ranging between the two extremes. For instantaneous plates, not of the special class mentioned above, the proportions of the mixture would be about seventy per cent. of the strong developer, and thirty per cent. of the modified one. So much latitude, however, does hydroquinone permit that, if we suppose a series of six plates of the same kind to have been exposed two, four, six, eight, ten, and twelve seconds respectively, there would be no need to vary the strength of the solution for each plate, but it would probably be found that a mixture of equal parts of the strong and modified developers would develop all the six plates equally well. If the light at the time of exposure was weak, it would be advisable to increase the proportion of the strong solution and decrease that of the modified one, and *vice versâ*. Different makes of plate will, of course, require different treatment, but a few trials will show what strength of solution works best with the particular kind of plate used.

After developing five or six plates, the bath should not be thrown away, but poured off into another bottle, and it can be used afterwards in place of the modified developer to mix with the original one. It will not grow weaker, because every time it is employed it is strengthened by being mixed with the strong solution. If, however, from long use it becomes of a deep red colour, it should be thrown away, and a fresh portion of the strong solution modified with water and acetic acid as already explained.

It should be remembered that, when the strong solution preponderates in the mixture, the resulting negative will be of a very soft, harmonious character (*grey*, in fact, when used unmixed), and that an excess of the modified or old developer will tend to produce a hard black and white negative; and this principle should be borne in mind in settling the composition of the developing bath.

The negatives are washed and fixed in the usual manner. Five minutes in a 15 per cent. hypo bath are sufficient, after which they are well washed again and placed in the alum bath.

Only glass dishes should be used as developing trays. Those made of *papier maché* have a tendency to darken the solution and render it useless.

Prints on bromide paper may be developed with hydroquinone, and, according to my experience, there is less difficulty in obtaining pure black tones with it than when ferrous oxalate is used.—*Journal of the Photographic Society of India.*

PHOTOGRAPHIC TERMS AND THE GERMAN LANGUAGE.*

As quite a number of photographers who attend the Convention in Washington have expressed a desire to take a trip to England and the Continent after the Convention has adjourned, for the express purpose of extending their photographic knowledge, and to become thoroughly familiar with the latest European methods, we consider it our duty to the craft to sound a note of warning to all such as contemplate an extension of their trip to Germany. As will be known to many, a systematic effort has been made ever since the termination of the Franco-Prussian war to expunge from the German language all words, expressions, and terms of foreign origin. How thoroughly this has been done will be apparent when we take for example the German substitutes for the two universal words telegraph and telephone—viz., *Electrischer-fernschreiber* (electric distant writer), *Fernsprecher* (distant speaker). For some reason still unexplained, photography and its attendant terms escaped for the time being. It is now stated, on apparently good authority, that one of the first edicts issued after the resignation of Prince Bismarck was an order relative to the expurgation of all foreign words which crept into the German language in connection with photography. The result of this is, that the tourist who visits Berlin and looks for the formerly familiar signs *Photographisches Atelier*, looks in vain. Nor would the uninitiated stranger be much the wiser if he gaped for an hour at the brand new sign over the entrance to one of Berlin's most celebrated galleries:

FRIEDRICH WILHELM RECHTECHTTEUTSCH,

H. u. K. Hof.-Lichtbildner

LICHTBILDNERWERKSTATT.

If his curiosity should overcome him, and he should enter the establishment, he would be surprised to find himself in an every-day photograph gallery. But even after entering the portal with the sign *Eingangsstube*, and being met with a polite reception from the *Empfangsfraulein*, he would not be less confounded, if he should point to a cabinet size and ask the price, and be told that *silber-pauslichtbilder* in *schlafstubengrösse* costs so much, but in *damenzurückziezimmergrösse* the price is so many marks higher. All this confusion is merely the result of the improvement in the German language. If the seeker after photographic knowledge would have a personal interview with the proprietor, he would send his card to the *Herr Hauptlichtbildner*, or if his business laid with the operator, he would simply ask for the *Dunkelkammersachverständigen*. The much abused amateur is known no more within the Imperial realm; he has vanished for ever. His successor is the *Herr Liebhaberlichtbildner*—a just punishment for his many shortcomings.

For the benefit of such members of the Eleventh Convention as propose a trip through Germany, we will give a few of the new German substitutes for our familiar terms: viz., skylight, *glasshaus*; printing-frame, *abklatschrahmen*; printer, *lichtpauser*; retoucher, *bildverschöneror*; burnisher, *heissglanzvorrichtung*; carte, *besuchsbrustkarte*; transpareney, *durchsichtsbild*; mount, *pappe*; negative, *gegenbild*; albumen paper, *eiweisspapier*; positive, *lichtpause*:

* From the *American Journal of Photography.*

photography, *lichtbildnerei*: photographer, *lichtbildner*; tripod, *stativ*: printing, *lichtpausverfahren*; silver printing, *silberpausverfahren*: blue print, *eisenpausverfahren*; orthochromatic, *farbenempfindlich*: leimtype, *leimlinienhochdruck*; and photogravure, *lichtgalvonotondruck*. Before passing this subject another word of caution: should any one of our photographic friends at any time be in a German dark room, and have the misfortune to be out of reach of the lid of his dry-plate box, and wish his brother *Dunkelkammersachverständiger* to hand it to him, let him be sure to ask for "*deudeckeldesbromsilberleimsubzdrockenplattenkästen*" if he wishes to be understood.

It is stated that, in view of these changes in the nomenclature, there has been a marked falling off in the photographic industry; further, that since the introduction of these synonyms there has been a steady increase of the population of the various lunatic asylums throughout the Fatherland from photographers who tried to comply with the Imperial edict. One fatal case is also announced, that of a German photographer who returned to Berlin after a long sojourn in the Congo basin, and who knew nothing of the expurgation during his absence. It is stated on the day of his arrival he stepped up to a news-stand and asked for a copy of the *Photographisches Wochenblatt*. The attendant told him she was sorry not to be able to serve him, but perhaps he meant *Das Lichtbildnerische Wochenblatt*, which was the leading *Zeitschrift für Lichtbildnerei*, handing him at the same time a copy of Dr. Meithe's well-known publication, resplendent with its Germanised title.

The old German gave one gasp, and expired.

J. F. S.

Picture Framing.—A very large percentage of the pictures used to decorate our walls is ruined by the framing. Why this should be so, what particular fault has rendered this or that picture so disappointing, requires a power of analysis and nice discrimination few of us have time or ability to exert. The decorator frequently knows no more of the proprieties in the case than the carpenter who saws out and fits the moulding, and is firmly persuaded that the most expensive is necessarily the handsomest frame. At an army post, with its meagre resources, one does not expect to find everything *comme il faut*, but a few months ago a parlour was furnished by a bride on the frontier that in many respects might serve as a model for more ambitious surroundings. The pictures especially attracted attention as something very superior, but a closer inspection showed that, though carefully chosen, much of the beauty was due to the appropriateness of the settings. The etchings were enclosed by a mat three to five inches in width, beyond which was a strip of oak about an inch wide, not varnished, but polished. If the etching and mat made a picture, say, a foot and a half long, the frame was two inches wide, with a very narrow gilt strip next the mat. A picture blue in tone had a darker blue mat and a very narrow white frame with a bit of gilt beading. A fruit piece with black background was very handsome without a mat, but with a dark, old-oak frame, flat, and fully four inches in width. A black and gilt beading ornamented the outer edge. Small water colours were framed in the same manner as the etchings, and were equally effective; while two photographs, larger than cabinet size, were simply framed in a two-inch board, covered with deep crimson velvet. All this sounds commonplace enough; yet one has but to compare two copies of an etching, engraving, or photograph framed, the one as indicated above with broad white margin, and simple strip of wood moulding, and the other with the old, florid, gold leaf square of plaster and wood, rising like a wall from the edge of the picture, to be convinced that half the pictures are spoiled by the mode of framing.—*Good Housekeeping, U.S.A.*

Patent Intelligence.

Applications for Letters Patent.

12,187. H. Stevens, Addlestone Lodge, Surrey, "Storing Photographs in a Single Frame."—August 5th.

12,189. W. Griffiths and J. Pumphrey, King's Heath, "Cameras."—August 5th.

12,216. J. Hart Davies, 186, Fleet Street, London, "Photographic Coin-Freed Apparatus." A. D. Loman, The Netherlands.—August 5th.

12,252. W. E. Schneider, 77, Chancery Lane, London, "Photographic Apparatus."—August 5th.

12,320. F. S. Worsley, 91, Charlton Lane, Old Charlton, Kent, "Cameras."—August 6th.

12,375. W. M. Campbell-Callender, 4, South Street, Finsbury, London, "New Material; a substitute for Celluloid."—August 7th.

12,442. W. P. Thompson, 6, Lord Street, Liverpool, "Photographic Shutters." The Bausch and Lamb Optical Company, United States.—August 9th.

Specifications Published.

14,701. *September 18th*, 1889.—"Hand-Drawn Negatives." John Malloch, 306, Lawnmarket, Edinburgh, Mapmounter.

My invention, which consists of a glass plate or other transparent substance coated with a non-actinic film, has for its object to produce a negative for photographic, photo-lithographic, photo-mechanical, and like printing purposes. By scratching off the non-actinic film from the glass plate with a needle or other sharp pointed instrument, fine lines of clear glass with non-actinic background are produced. I can thus scratch out sketches which yield a fine negative for the purposes before-mentioned.

If desired, the non-actinic film may be coated with, or have incorporated with it, substances sensitive to light which, when used, would provide a photographic impression on the plate previous to etching.

12,972. *August 16th*, 1889.—"Improvements in Magic Lanterns." James Henry Steward, 406, Strand, London, Optician.

Improvements in magic or optical lanterns, consisting, first, of an improved method of adjusting the fronts and lenses (the optical system); and second, improved oxy-hydrogen lime-light jet for the more perfectly centreing, adjusting, and controlling the light.

The mechanical details of this invention are explained in the specification by means of drawings.

15,714. *October 7th*, 1889.—"Photographic Shutter." Charles Hoddle, 258A, Mare Street, Hackney, London, Boot and Shoe Maker.

My invention is a shutter made to provide a simple and ready means to expose photographic dry plates when in the camera. It is made to work either before or behind the lens, but mostly in the diaphragm slot. The novelty in this shutter is, that it requires no setting or winding of springs, as all other shutters do, before an exposure can be made. To make an exposure it is only necessary to press a small button; and immediately the pressure is made it automatically sets itself ready for the next exposure.

To effect this I make a shutter of thin sheet brass, or other material, shaped so as to cover the lens, and made with a short arm projecting at right angles to the lens, and pivoted at the far end of the said short arm; close to the pivot I fasten on to said arm a small slip catch, which is acted upon by a short, stiff, upright spring which is attached to a thin brass driving rod running in guides, which has a small button at bottom. This thin brass is held back just underneath the said slip catch by a spiral spring of suitable strength. The shutter is also held over the lens by a second spiral spring. Now on pressing the small button the shutter is lifted to a sufficient height to uncover the lens. The short spring at top of driving rod then leaves the slip catch, and allows the shutter to spring back to original position; then, on removing the pressure from the said button, the driving rod springs back to its original position

also, and is immediately ready for the next exposure. The shutter can be made to travel that it can be loosened or tightened at will. The shutter can be adapted to any kind of photographic apparatus, but it is invented chiefly for use with the detective kinds.

239. *Jan. 7th*, 1890.—"Photographic Cameras." WILLIAM SNOW ROGERS, 7, Addison Road, Bedford Park, Chiswick, Middlesex, Engineer.

My invention relates to photographic cameras of the type known as "hand" or "detective" cameras, and particularly to the means for effecting the transfer within the camera of any plate, film, or other sensitised surface from its place within the storage reservoir to its position for exposure, and its removal therefrom, its replacement within the reservoir, and the substitution of another unexposed plate, the operations providing for the exposure of any or all of the plates as desired.

To carry this invention into effect, I employ a light-tight reservoir with vertical parallel grooves to contain the plates, forming a backward extension of the camera. This reservoir can be filled through a door provided for the purpose, or by means of the valve to be described hereunder. I also provide in the camera proper, and immediately in front of the reservoir, a single groove to carry the plate whilst it is being exposed, and a spring or springs to keep the plate against the side of the groove or rebate nearest to the lens. Above the space occupied by the exposing groove and the set of storage grooves is an opening provided with a sliding light-tight shutter constructed as follows :—

The fore part of the shutter is rigid, and slides beneath the camera top, and in light-tight contact with it. The centre part consists of a valve and changing reservoir, to be described more fully hereunder, and the back part of the shutter consists of a hinged or flexible portion.

The range of movement of the shutter is such that the valve and changing reservoir can be brought successively over all or over any groove, including the exposing groove, at will, and the hinged or flexible part of the shutter is guided vertically downwards at the back of the storage reservoir by means of a curved groove, as the shutter is moved in that direction.

The valve consists of a cylindrical part slotted through in a plane passing through its axis to allow a passage for the plate, and capable of moving about its axis over an angle of about 180° upon a curved seating covered with velvet, or otherwise made impervious to light.

This valve seat also is slotted for the passage of the plate, to correspond with the valve slot when the latter stands vertically.

Forming a continuation of the valve slot is a light-tight reservoir of sufficient size only to contain a single plate in grooves.

The action of the camera is thus : Having placed in the storage reservoir its full complement, or any less number, of plates, the sliding shutter is moved along until the valve comes above the first groove ; the changing reservoir is then moved so that it stands at right angles to the camera top, by which means the valve is opened, and on turning the camera up side down the first—or any selected—plate falls into the changing reservoir. The sliding shutter is then moved forward to its full limit, when the valve will have come immediately above the exposing groove, and the plate may be made to drop therein by turning the camera right side up. The operation is reversed to return the exposed plate to the reservoir, and the next plate can then be dealt with.

A ratchet, pointer, or other registering device is used to indicate the position of the grooves in the storage reservoir, and to register the exposed plates.

The valve may be used as the means of filling the reservoir if so desired, and when not in use the changing reservoir may be folded down flat upon the camera.

On Wednesday last their Royal Highnesses the Prince of Wales and his daughters, the two younger princesses, honoured Mr. A. Debenham with sittings on board the royal yacht off Cowes.

Correspondence.

SAMUEL FRY AND COMPANY, LIMITED.

SIR,—Will you kindly allow us to notify the public, through your columns, that we have purchased the business, goodwill, and stock-in-trade of Samuel Fry and Co., Limited, of Chandos Street, London, and Kingston-on-Thames.

The business will be continued at both places, as before, under the style of "The Fry Manufacturing Company," of which we are the proprietors.

Full announcement will be made in your advertising columns to all our customers and friends generally.—Thanking you in advance for your courtesy,

S. HERBERT FRY,
A. E. HAYMAN.

WHAT ARE THE BEST USES TO WHICH PHOTOGRAPHY CAN BE APPLIED?

SIR,—For the first time in my life I went in for a prize competition of the *Tit Bits* model. This not because I was very anxious to gain the prize, a £7 or £8 amateur's outfit in photography by the good firm of Mawson & Swan, at whose warehouse in Soho Square the articles were on view. I never went, however, to inspect. My chief object was to test the value of this competition, and to expose it if not fairly conducted.

I confess I felt there was really no guarantee that the best would win. All these competitions seem to be managed in a very "hole-and-corner" manner.

As the editor of *Short Cuts* announced that if this competition was extensively taken up a more important one in photography would follow, and as he states that 2,291 replies had been received for the present one, I think photographers should be warned not to waste their time and brains over a competition of this kind, where they have no assurance that the judge who is to decide is acquainted with the subject, and is, above all, suspicion of partiality or unfairness.

Believing that after many years' experience I was not unfamiliar with the best applications of our noble art science, I determined to try my luck and test Mr. "Short Cuts." Soon after the announcement I sent in the short article which follows this.

The competition was to close on June 12th. Here was unfairness No. 1 ; the editor arbitrarily extends it to July 12th. Let that pass, however.

Seeing, some time after I had sent in my communication, a "outlet" by the editor informing "Photographer" that it was not an essay but something short that was required, and thinking that perhaps my tolerably brief communication might be considered not "short," and perhaps classed as an essay, I sent in a second as-short-as-I-could-make-it answer. I give this also below.

Some time after this Mr. Editor makes a new condition, viz., that all communications must be accompanied by the printed notice of the competition cut from a copy of *Short Cuts*. To this no one could object had it been stated at the outset. It was not, so here is unfairness No. 2. However, I duly sent the cutting with a note to the Editor mentioning my two communications.

At length, in *Illustrated Short Cuts*, August 2nd, the award is made. The prize is given to a gentleman who has written an *essay* more than *a fourth longer* than mine, and who has named specifically only two of the best applications of photography, both of which I had named specifically in my second communication, and inferentially in my first. He says not a word of lantern slides—perhaps *the* most important of the applications of photography, embracing, as they do, astronomy, microscopy, portraiture, landscape, architecture, &c., and invaluable as a means of education.

Now, I do not mean to say that there may not be some one who has "spotted" still more important applications of the art than I have done, but I do most distinctly assert that the prize winner has not given such a specific and practically exhaustive reply as I have done in my second communication, sent in in order to comply with the editor's own conditions. I hold also

that my first communication, in pointing to the value of photography as a means of training to good habits and acquiring knowledge, is more to the point than a pious dissertation about "the Great Cause of All" and the mystery of nature. I purposely kept my essay, if such it can be termed, as brief as possible, although I could easily have dilated on the points stated.

That your readers may judge for themselves whether the award has been fairly made or not, I append first the prize-man's article, second my first communication, and third my last.

The prize was awarded to D. Hanneford, 30, Avenue Terrace, Forest Gate, E., to whom a complete photographic set, by Messrs. Mawson & Swan, of Soho Square, valued at £7 16s. 6d., has been sent.

His answer is as follows :—

"The Best Uses of Photography.

"It has been well said by Sir William Hamilton that 'On earth there is nothing great but man : in man there is nothing great but mind.' To broaden and elevate the mind of man, then, must be a work of paramount importance, and to employ anything to that end must be to make the best use of it.

"In replying, therefore, to the question, 'What are the best uses of photography?' we must consider how that wonderful discovery can be best applied to ennobling the human mind.

"The answer, in my opinion, will be found in the application of photography to the furtherance of the sciences, especially astronomy. The telescope, armed with the highly sensitive photographic plate, has revealed to the modern observer a universe of which Newton and Herschel had not the faintest conception. It has drawn for us the picture of suns whose distances and dimensions are inconceivable in their greatness. Nor is this all ; with the assistance of the spectroscope we are enabled, by comparing observations of the heavenly orbs made at various times, to learn their composition and the changes taking place in the evolution of worlds and systems separated from us by infinitude.

"Here, then, the mind is enlarged by the contemplation of the stupendous grandeur of creation.

"Again, photography has lent its aid to the microscope in revealing to us the other extremity of the infinite—the infinitely small. A drop of water, which to the unaided eye is scarcely visible, is shown by the microscope to be a world teeming with life the most complex and wonderful. For years these wonders were for the eye of the wealthy observer only, a microscope being a luxury only for the few ; but photography steps in, and with little expense hundreds of the most accurate pictures of life in this universe of the infinitely minute are ready for distribution, and thousands who before knew nothing outside their own commonplace sphere are made acquainted with the marvels of nature.

"To what a grand extent must these uses of photography act upon the human mind to expand it. When we contemplate the infinities around us, and ask the questions, Whence comes it all? and whither does it tend? we find ourselves in the presence of an awful mystery, and we re-echo the cry of the Psalmist, but with greater meaning, 'The Heavens declare the glory of God, and the firmament showeth His handiwork.'

"Our ideas of the Great Cause of All are also raised, and with greater knowledge comes greater reverence and greater charity, and each fresh agent of science lends its aid to exterminate those twin sisters, ignorance and bigotry, and herald the millenium of peace and goodwill to mankind."

My first article was as follows :—

"Speaking generally, I think the best uses of photography are :—

"1. The production of slides for the optical lantern to be used for educational and scientific purposes. Accompanied by oral description in the form of lecture or otherwise, good photographic lantern slides impress the minds of children and adults through the most effective combination of senses—seeing and hearing.

"2. The practice of photography in any of its numerous branches is also eminently educational for its votaries as regards technics, science, art, and mental training.

"No one can be a good photographer who does not endeavour to understand the 'why' and the 'wherefore' ; no one can be a good photographer who has not learnt to be careful and systematic in working ; no one can be a good photographer who has not learnt the 'power of littles' ; and lastly, no one can be a good photographer who lacks perseverance.

"3. Another *best* use of photography : it promotes brotherly feeling ; there is a good deal of freemasonry among the members of the craft where it is practised not for lucre, but for love ; even among professionals there is some solidarity.

"4. Yet another *best* use. Memorials of the living and the dead—*vera effigies*, which bring before us individuals ; memorials of past and present—the monuments of Assyria, Egypt, Greece, and Italy ; or life and scenes in the present 'Darkest Africa.'

"There can be, however, no best uses of photography singled out from its numerous applications. There is only one best use of anything—its efficiency for the object in view. Photography is found invaluable to the astronomer ; it is also invaluable to the producer of tintypes on Ramsgate sands. Perhaps one of those tintypes of a 'puling infant' will bring more joy to the heart of its loving mother than she would get by looking at Common's splendid photographs of nebulæ.

"We are all tempted to consider that to be the best use of anything which we use, the way we use it, and the good which its use brings us. The best uses of photography are, therefore, legion."

My second communication, sent July 1st, 1890, was as follows :—

"Sir,—In case you may consider my answer sent you in May last to be not sufficiently short—the word 'short' is as indefinite as the proverbial 'piece of chalk'—I send below more briefly what I consider the best uses to which photography can be applied :—

"1. Lantern slides for educational, scientific, and recreative purposes.

"2. Portraiture.

"3. Views—landscape and architecture.

"4. Photographic engraving, collotype, &c., for book, periodical, or newspaper illustration.

"5. Astronomical and microscopical work.

"To sum up in one short answer : —

"6. Every use of photography which brings pleasure or profit to man, woman, or child." Duncan C. Dallas.

Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting on the 7th inst. Mr. W. Ackland occupied the chair.

Mr. Otto Scholzig and Mr. D. Hurst were elected members of the Association.

At the previous meeting prints were shown by Mr. Otto Scholzig, some of which had been well washed, and the remainder only slighted rinsed in water previous to toning ; the contention was that the latter, from toning much quicker than the others, and being of a richer black, absorbed more gold, and consequently were more permanent. This being disputed, it was agreed to subject the prints to test solutions.

Mr. A. Haddon now handed to the chairman three bottles containing solutions for this purpose.—1. Cyanide of potassium 10 per cent ; 2. Nitric acid 20 per cent ; 3. Bichloride of mercury saturated solution. A piece of each of the prints referred to was immersed in these solutions, and marked A and B respectively. A, slightly washed ; B, well washed. In the first solution the print marked B commenced to change in one minute after immersion. In No. 2 solution, the immersion was continued for three minutes, the print marked B again showing, in comparison with A, greater deterioration of image. In No. 3 solution, the prints remained to the end of the meeting without incurring any material change.

The subject of home portraiture being introduced, Mr. W. E. Debenham dwelt upon the importance of the

position of the reflector used; this should be placed a little forward and raised considerably; a crumb cloth spread on the floor would assist to reflect light upwards. He contended that a large reflector placed at a distance from the sitter gave a better illumination than a small one placed nearer.

Mr. F. A. BRIDGE suggested placing the reflector at an angle to reflect the light upwards. A sheet, suspended and fastened at each bottom corner to chairs, answered capitally, as the chairs could be drawn backwards or forwards until the best effect of lighting was secured.

[Mr. H. M. Hastings writes that in our last report of this Association's meetings the word "washed" is a misprint for "masked."]

THE SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of the above Society was held at the Masonic Hall, Surrey Street, on Tuesday evening last, with Mr. B. J. TAYLOR in the chair. After the routine business of the meeting, the award of Messrs. Geo. Davison and Lyonel Clark—the judges in the recent competition, subject, a "Genre Study"—was made known, the result being that the president, Mr. B. J. Taylor, was declared the winner. No other picture was deemed of sufficient merit for the awarding of a second prize; that prize was, therefore, withheld.

THE "CROTONWANZE."—The *Photographisches Wochenblatt*, ably edited by Dr. A. Miethe, of Berlin, has received several communications or inquiries in regard to the article in the *American Journal of Photography* in reference to a new danger which threatened the American dry plate industry, and in which the *Wochenblatt* is quoted. Dr. Miethe thus disposes of the subject in his reply to an "Anxious Inquirer":—"Herrn P 117.—We have the article also now read, and ourselves much amused. You wonder yourself even so as we, that the smart Yankee our notice and warning against the 'Crotonwanze' for real earnest have taken. The dressing up of the jest is, however, very pretty. Our notice originated, however, as a matter of fact, in one American periodical, where it on an important place to find is."

LIGHT AND SHADE.—Light and shade, independent of its effects in rendering objects more distinct and intelligible, has other properties, and those of a higher quality; when portraiture has to take a station in the ranks along with music and poetry, these properties are the means of giving breadth and grandeur of form, the effects of bustle or repose, which portions of a picture require. Light and shade, or the conduct of the chiaroscuro of any work, is entirely given up to the control of the artist, to be used for the express purpose of rendering his design complete; where he departs too much from the arrangements observable in nature it becomes capricious, and loses its effect upon the eye; when, on the other hand, the every-day occurrences are adopted, his work becomes common and feeble. Reynolds says justly, "When we are required to paint broad, it is not understood that we should paint broader than nature; but objects are to be so placed that there is scarcely any limit to their breadth of light and shade." In the earlier stages of painting, relief and distinctness were the only requisites sought after. But whatever way the student takes to get an insight into this great charm of painting, either in arranging his composition so as to suit any particular effect of light and shade, or in trying various means of distributing light and shade over his design, let him carefully watch, both in nature and in art, its various combinations, and endeavour to find out the latent cause of beauty. As the etchings of Rembrandt embrace this quality in the highest degree, from a mere outline to the most extensive depth of shadow, they ought to be constantly before him when he has it in his power; they ought to be viewed in every direction, to enable the eye to get acquainted with the proportions of light, dark, and half-tint; he ought also to engraft the scheme of chiaroscuro on designs of his own, that the harmony which exists in these wonderful productions may be transferred, if possible, into new inventions.—*Burnet.*

RECEIVED.—Notice of change of address of Messrs. H. C. Lewis & Co., formerly of Ranelagh Street, Liverpool, to 31, Bold Street, Liverpool.

Answers to Correspondents.

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

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

V. B.—*Performance of Copying Lens.* Paste a sheet of the *Times*, *Standard*, or other clearly printed newspaper upon a drawing board, focus the lens upon it, and observe the definition at centre and margin, using a small stop. When the field appears flat and all in good definition take a photograph, and if the picture comes out sharp all over, or good within a certain area, there is no doubt about your being able to use the lens for copying up to that size.

G. P.—*Gold Toned Prints.* It is perhaps doubtful, notwithstanding the statement on page 623, whether the *whole* of the silver is replaced by gold in what is called a "rich black" print. Special experiments have hitherto shown that for this to be the case, the toning process must have gone on to the point of furnishing a green (overtoned) print. By burning one of the rich black impressions, and boiling the ashes with dilute nitric acid, the presence or absence of silver in the solution could at once be decided.

L. E. M.—*Effect of Ruby Light on the Eyes.* In summer time one ought to be careful to close the eyes for a few moments when coming out of the dark room, so as to avoid sudden transition from this trying light to brilliant sunshine. There is no doubt that the strain put upon the retinæ by incautious exposure is often very prejudicial to the visual organs, and may eventually produce decided and permanent ill effects. The temporary use of neutral tinted spectacles might be advantageous.

E. DARWELL.—*Alkali Equivalents in Developers.* It is by no means certain that the work done by different caustic and carbonated alkalies will be exactly proportional to their atomic weights; but here are the chemical equivalents in case you would like to try experiments for yourself:—·880 ammonia contains 27·3 per cent of real NH_3, the atomic weight of which, without water, is 17; pure sodium hydrate, NaHO, is 40; potassium hydrate, KHO, is 56; dry carbonate of soda, Na_2CO_3 (halved), is 53; dry carbonate of potash, K_2CO_3 (halved), is 69. In our view of the case 40 parts of caustic soda would go very much farther, as an alkali, than 53 parts of dry carbonate of soda.

W. TULLY.—You might get Mr. W. T. Wilkinson's "Photo-Engraving and Photo-Lithography," published by Messrs England Brothers, Charles Street, Notting Hill, W.; or Lietze's American work, "Modern Heliographic Processes," New York, Van Nostrand Company.

C. N.—*Varnish for Bright Silver.* Gum sandarac is dissolved in methylated spirit, to which an equal bulk of amylic acetate is added. The silver articles, freshly polished with a leather, are slightly warmed and then painted with or immersed in the varnish; they are then dried off in the open air, to allow the amyl fumes to escape, for if inhaled they are almost certain to cause severe headache. It is important to go over the whole surface very thoroughly if done by hand, as small patches of the silver left uncoated will only be detected, after a time, by the tarnishing of the metal at those parts; hence the method of total immersion is often the better plan.

CITRO (Shide).—*Testing Citric Acid for Tartaric Impurity.* Add a small quantity of carbonate of potash, stir well, and allow to stand at rest for some time. In the event of any appreciable quantity of tartaric acid being present, a white crystalline deposit of tartar will separate out and partly adhere to the sides of the test tube.

GLASGOW.—*Platino-Mechanical.* We have no knowledge of any such combined process as that referred to in your letter, but see no objection to working the two distinctly different operations successively.

Other correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1668.—*August* 22, 1890.

CONTENTS.

CLOUDS.

If it were possible for photographers to bring an action against the clerk of the weather for business opportunities lost in consequence of his vagaries during the present year, they would stand a good chance of obtaining exemplary damages. From all parts of the country have there been complaints of long periods of wet, when, according to past experience, it should have been dry, and of unsettled conditions where sunshine should reign undisturbed. Bad weather means stoppage of business all round, but, hard as their lot may appear to be, photographers are not by any means the most to be pitied, for although their hands may be idle during the bad time, they have not the mortification of knowing, like the poor farmers, that the fruit of their past labours is rotting for want of harvesting.

Photography is an art that is full of disappointments. We all of us know how something is apt to go wrong at the last moment, and how fond hopes are thus shattered. But it also has an advantage in giving its votaries plenty to do indoors, such as in the after-treatment of negatives and enlarging, when camera work is out of the question. Even unsettled weather brings with it a compensation in the opportunities it affords of obtaining cloud negatives, for at no other time does the firmament offer a more lovely field for this kind of work than it does when the barometer is on the move.

And it is necessary that the advanced photographer should have at hand cloud negatives to wed to his landscapes. Under certain happy combinations of circumstances it is possible to get a natural sky above a landscape on the same negative, but this desirable event very seldom occurs, and we may take it as a rule that the sky must be separately recorded. Excellent sky negatives can now be purchased, and their existence shows that there is a demand for such things. But the photographer who considers himself an artist, and even the conscientious man who cannot lay claim to that distinction, will refuse to be beholden to another hand for any part of his pictures, and will insist on using cloud negatives of his own production, or none at all. In this resolve he is wise, for setting apart all question of ethics, he will not care to run the risk of exhibiting a picture in which may be recognised the same sky which appears in somebody else's work. It is obvious that if two men purchase the same set of sky negatives, they must be prepared to run such a risk.

Cloud negatives are certainly troublesome things to produce, not because there is any particular difficulty in making them, but because much time is likely to be consumed in running down the quarry. In the same sense, we might say that it is not very difficult to shoot a stag, but you must spend much time in seeking him out. The expectant photographer may spend all his spare time in looking out for a sky which will photograph well—that is to say, a sky which presents much contrast of light and shade; heavy masses of cumulus against deep blue, or a dark cloud with its silver lining brightly showing. Such contrasts are common enough, but they generally seem to come when the camera is not at hand, or when there is no plate in the dark slide. A sportsman knows full well how the birds rise almost from his feet when he happens to leave his gun behind him, and he generally ascribes the provoking circumstance to the artfulness of the feathered bipeds. It would almost seem that the clouds treat the poor photographer in the same way, and mock him by their presence when he is unarmed, and therefore unable to be revenged upon them.

At the last exhibition of the Meteorological Society several very fine cloud pictures were shown. These were taken for scientific purposes, and possibly in the hope that they might help in the matter of weather study. But, apart from the scientific value of such works, they are objects of great beauty, notwithstanding the absence of nature's wondrous range of tints, for clouds take every diversity of form, and their shapes, owing to the veil of atmosphere through which they are seen, are never harsh, and are seldom cut with hard outlines. Cloudland is, indeed, full of fairy

forms, which change and change again with such rapidity that it is often difficult to catch the effect which it is desired to record. Before the camera can be set up the effect is gone, and it may be a long time before anything like it is seen again.

A cloudy sky through which the sun now and again endeavours to pierce an opening is the finest effect of light and colour which nature offers to the delighted eyes of men. And when the firmament has below it the ocean, which reflects upon its troubled bosom every delicate tint and shade, and which is occasionally crossed with bars of burnished gold where the rays can touch it, the beauty of the scene is enhanced a thousand-fold. Such scenes are not uncommon on our western coasts when the sun sinks to rest, and equally lovely visions are vouchsafed to early risers on our eastern shores. Mere sky and sea are sufficient to make up a picture, the loveliness and glory of which are without parallel, although some may prefer to endow it with human interest by the presence of a fleet of fishing boats going to or returning from their dangerous quest.

For the benefit of those who have not had much experience in making cloud negatives, we may offer a few words of advice respecting the manner of going to work. If the sun is to be included in the picture, as it commonly is in so-called moonlight effects, films or ground glass backed plates should be used. Any lens which will take a good landscape can be used, and its smallest stop should be employed. As a rule, the exposure will be about one second on a slow plate, but in the case of red sunrises and sunsets, this may often be increased to as much as eight or even ten seconds unless isochromatic plates are available. The development must be very carefully watched, and not carried too far.

Photographers who desire to help their distressed fellows would do well to send a donation to the Photographers' Benevolent Association, which is sadly in need of funds.

The Advancement of Photography.—Photography has seen much advancement of late years, and a vista of discovery and improvement, boundless and wonderful, stretches before it, which time alone will be able to define. If we to-day could but see photography as it will be fifty years hence, we should doubtless be equally if not more astounded than Wedgwood, the father of photographers, would be were he recalled to life now and shown the amazing heights of improvement his art has reached to. Thanks to its many seductive characteristics, than photography no science has acquired greater popularity, nor secured under its banner more ardent amateurs. —*Liverpool Echo.*

Photography in Florence.—Dark room accommodation for pilgrims is becoming common all over, not only our own, but also other countries. We have received from Signor A. Anghinelte the prospectus of a dark room company, which has organised a completely fitted up establishment, including laboratory, studio, finishing room, lecture room, and library, with all necessary teaching appliances, under the direction of Signor G. Moretti, for the use of amateurs at via della Scalla, 15 piano terrano, Florence. Members of the Photographic Society of Italy, and amateurs resident in Florence, may have the use of the establishment daily from 10 till 4 for a small annual payment, and practical instruction on the development of negatives or finishing of prints at very moderate charges; while members of photographic societies from any part of the world, who may visit Florence, are invited to use the laboratory free of charge.—*The Beacon.*

THE PHOTOGRAPHIC SOCIETY OF THE NORTH OF FRANCE.

I.

The Society bearing the above title has its headquarters at Douai, and is nearer to London than any other photographic society in France; in fact, it may be reached *via* Calais in five or six hours. Another route lies partly through Belgium, *via* Ostend, for Douai is on the main line from Ostend to Paris, along which run about two fast trains every day each way. Along the latter route the country is practically flat the whole way, but is slightly undulating just after passing the French frontier. Lille, said by some to rank fifth, and by others seventh, among the greater cities of France, is passed *en route*. By the slow trains the Belgian city of Courtrai may be visited on the way to Douai, and it is worth attention for photographic purposes, because of specimens of old ecclesiastical architecture, and from the new bridge across the river a picturesque view of the old bridge with ancient towers at each end is obtainable. Lille, for its size, has not many specimens of remarkable public buildings, ancient or modern, but there are a few. The people in these regions, and as far south as Lille, differ scarcely at all from the Belgians; Van Damme and other highly respectable Flemish or Dutch names are often to be seen over the windows of the shops in these parts, but French characteristics are rather more pronounced than farther north. The "Golden Lion" is a common hotel and inn sign about Belgium, and in the north the French also use it frequently, but display originality of thought by introducing also the sign of the Golden Ape. The Photographic Society of the North of France possesses the Golden Ape himself, secured by a light chain, which allows him to run some distance in the garden, and to climb up the windows of the house; the chain is not long enough to let him get at the printing-frames. We do not say that this active little ape is golden to the vulgar eye, but that he is golden by virtue of his numerous intellectual and moral qualities. Why should he not be trained to attend to the printing operations, and to take out the papers when the exposures have been sufficient? It is a fact that an ape has been trained to do the signalling, under direction, at one of the railway stations in Natal.

The Belgians in the villages between Ostend and the French frontier make up for the flatness of the land in which they dwell by constructing high spires to their churches, but the spires do not usually come to a point at the top, because the natives wish to see the view. The church spires, therefore, frequently have at the top what from the ground looks like a pigeon-house with a balcony running round the outside; close at hand, this elevated house is seen to be large enough to accommodate several sight-seers.

When the lines in these parts are not cleared for the few quick trains, some nondescript, slow-travelling vehicles occasionally appear upon the rails,

but get out of the way again before the times of their fleeter brethren draw near. A few days ago, at a junction station called Roulers, we alighted and explored the village, then waited for a slow train to Courtrai. A great vehicle of a blood-red colour came "lumbering" into the station, and it proved to be a train made all in one piece; the whole of it was mounted on one rigid framework. The first part of the frame supported the engine, close behind which was the luggage compartment, in which the luggage was kept comfortably warm. Behind that was a passage across the train—if train it may be called—for the entrances to the carriages were at the ends. Then came the third class section, next the second class section, then the first class section, and lastly, the guard's brake compartment. In this ponderous, but economical and useful vehicle, which travelled slowly and stopped at every station, Courtrai was reached.

Douai, which is situated on the Scarpe, covers an unusually large area in proportion to its population, so many of the houses have good gardens attached. The town is surrounded with the ruins of the ancient wall and fortifications; it has a noble belfry tower and Hotel de Ville, and some picturesque old churches, consequently a certain amount of photographic work can be done therein, and some of the members of the Photographic Society there tell us that there is no impediment in the way of anyone taking photographic views in Douai.

The town and surrounding country are flat. At the last Paris Exhibition the members of the Photographic Society of the North of France exhibited an album containing work done by its members. One photograph represented the *Géant Gayant* with his wife and family; the giant and his wife are each thirty feet high, and have moderately handsome faces; these giant dolls are made of osier, and each is worked by eight men inside. The family of giants is carried through Douai in a curious procession, which traverses the streets of the town early in July every year, according to ancient custom.

Of the work done by the Photographic Society of the North of France, we shall have something to say in the next article upon the present subject.

Photographic Conventions.—The oft-quoted saying that "the child is father to the man" is, to a large extent, applicable to the relation existing between the British Convention and her mother, the Photographers' Association of America, as, although only in her fifth year, the daughter has objects in view and ways of going to work that might be advantageously adopted by the mother. For one thing, the distinction between professional and amateur does not exist, and those who live by the practice of photography leave the "shop" behind, and meet those who only practise the art for the love of it on equal terms, and with but one, or rather two, objects in view, the advancement of photography as a science and art, and the cultivation of good fellowship by social intercourse. The offices are positions of honour and not emolument, and as there are no axes to grind, and no party factions to be considered, there is neither contention nor contest, the best man for each particular office being generally appointed *nemine contradicente*. — *The Beacon.*

THE CAMERA CLUB AND TRADING IN PHOTOGRAPHY.

There is a certain amount of truth in the prevalent rumour to which we gave publicity last week, about the Camera Club having the idea of letting a part of its new premises to a dealer in photographic goods. We have been told that the part of the ground floor let as a shop is entirely detached from the Club; there is a corridor belonging to the premises at the back, severing the Club from the shop. The entrance of the shop is at the corner of Cecil Court; the entrance to the Club is away at the other extremity of the façade. The Club will have nothing to do with controlling the dealer on the premises, and "the Club Company will give him a lease of seven or fourteen years," says a member of the Club, "just as we ourselves will have," and the Club will not think of making any kind of arrangement with the occupier. "The shop had to be let, and anyone could have it. It may be a convenience to some members to have a general photographic depôt near at hand, but the tenant will be entirely independent, and can snap his fingers at the Club if he so wishes." Such may be taken to be the view of some of those members of the Club in favour of the scheme.

For particular purposes the tenant is unlikely to draw any nice distinctions between organisations so closely allied as the Camera Club, and the Camera Club Company, Limited, and should he obtain but a seven years' lease, his freedom from the influence of members of the Club would be small, so the expression of opinion about the matter which we made last week, from our present point of view holds good. Should, however, he obtain a fourteen years' lease, doubtless he will have a greater proportion of freedom, at all events during the first seven or eight years. In accordance with the not over-elegant parable we put forth last week, but in terms "easily to be understanded by people," a seven-years' tenant at a moderate rental will look upon the possible obtaining of another seven years' lease upon the same terms, as a prospective "bunch of carrots" before his nose, and the non-renewal thereof on those terms as "the stick," so is not likely to regard any one of his numerous landlords with club voting power who may deal with him, in quite the same light as he would regard an ordinary customer not connected with the Club.

So long as the shop is on the premises at all, its exact geographical position thereon, and where its doors may be situated, seem to have no bearing on the question at issue. Perhaps it would be better were the shop in front rather than in a less prominent position. Once, in some discussion at the Club about professional and amateur photographers, Mr. Lyonel Clark made a statement to the effect that if anyone were "fool enough" to want to buy one of his pictures, he would sell it without hesitation. That was a bold, clear statement, to be respected. On like principles, with any shop at all on the Club premises, it might better be in front than elsewhere, and rendered

as prominent and attractive as possible. Once upon a time, shortly before the Paris Exhibition opened, in many of the shop windows of Paris might be seen a picture of the back of an elderly and stout peasant woman passing one of the *octroi* officers, to whom she shows her basket containing a few eggs, and declares that she has no game in her possession. The leaning forward to display the contents of the basket, revealed to the spectators behind, the head of a hare with its long ears dangling between her ankles. It would have been better had she displayed that hare with the eggs in her basket in front.

No doubt, with all the photographic conveniences provided on the new premises of the Camera Club, a shop in the basement at which photographic goods could be purchased would be additionally handy, but the convenience may be bought at too high a price, and give rise to various complications in the future. The meaner the individual, the more likely is he to impute unworthy motives, because he judges others by himself, and knows what he would do under similar circumstances, so with the somewhat strained relations between amateur and professional photographers, a few among the latter are likely to be found who will consider this shop not to have been started without ulterior objects.

No doubt much more time has been devoted to the consideration of these points by the members of the Camera Club than we have had an opportunity of giving, and as they have not yet published any official statement on the subject, it is judicious for everyone to wait until that statement is issued before forming a decided opinion.

The question at issue is one which concerns the members of the Club more than anyone else, because it affects the influence of the organisation. In any large organisation there is small power of controlling the erratic actions of some of the members, but as regards the Camera Club we have thought that its well-deserved influence would be increased, were there some rule that no member who has shares in any company—except the Camera Club Company, Limited—commercially connected with photography, shall be eligible to a seat on the Council, or to the position of an office-bearer connected therewith. With this rule, and with no shop on the premises, it is probable that decisions of the Club in relation to anything connected with photographic science and art would carry additional weight with both amateur and professional photographers, who might sometimes like to have a tribunal to which to appeal, about the disinterestedness of which tribunal all felt satisfied; and even "appearances" would have an influence in promoting the growth of such confidence.

THE PHOTOGRAPHIC CLUB.—The subject for discussion on August 27th will be "Printing under Coloured Media;" September 3rd, "Supplementary Exposures." Monthly Saturday outing August 30th at Pinner; train from Baker Street at 2.26.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

TIMING FLASH LIGHTS—SILHOUETTES—IRIDIUM PAPER—LIESEGANG'S PHONOGRAPH.

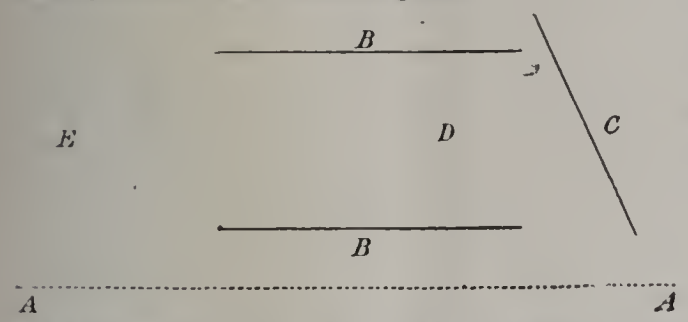
Timing the Duration of Flash-Lights.—Professor Eder has made some interesting experiments, together with Captain von Reisinger, for the purpose of timing the duration of the flash produced by various modes of burning the flash powder. He employed a heavy wheel of black wood of about twenty-six inches diameter, which is caused to revolve around its axis by hand. At the centre of the wheel a silvered hemisphere of glass was attached, and a similar one at the circumference of the wheel. The latter was caused to revolve at the rate of one revolution a second. At first the image reflected by the hemispheres was focussed by means of a candle-light, then the room was darkened, the sensitive plate inserted, the lens uncovered, the wheel caused to revolve, and the flash produced. The plate was then developed, and showed a sharp point at the centre of the wheel, and a sharp black line extending partly round the circle made by the rim of the wheel. This was the reflected light of the flash, and showed the arc through which the wheel had turned while the flash was produced. If this arc amounts to one-fourth of the circumference, the duration of the exposure has been $\frac{1}{4}$ second. The results of the experiments are as follows:—

Explosive magnesium mixture; 30 parts of perchlorate of potash, 30 parts of chlorate of potash, 40 parts of magnesium powder, containing 8 grains of magnesium... ...	$\frac{1}{20}$ to $\frac{1}{30}$ second.
Pure magnesium powder, blown as fast as possible through a glass tube into a spirit flame by means of an india-rubber tube held in the mouth; containing 8 grains of magnesium	$\frac{1}{8}$ second.
Pure magnesium powder, burnt in Mr. Von Loehr's flash lamp; 8 grains of magnesium	$\frac{1}{4}$ second.
Pure magnesium powder, burnt by means of Dr. Hesekiel's flash lamp; 4 grains of magnesium	$\frac{1}{13}$ second.
Pure magnesium powder, burnt in Prof. Schirm's flash lamp; 4 grains of magnesium	$\frac{1}{7}$ second.

These experiments show that the charges of magnesium powder mixed with chlorate of potash (the so-called explosive mixtures) are much quicker in combustion than those of pure magnesium powder alone. To those operators who have experience in flash-light photography this result will not be surprising, but it is well known that the various flash-light mixtures in which the magnesium is kept stored in mixture with potassium chlorate, picric acid, or other compounds acting as supporters of combustion, have occasioned serious accidents, so that it is doubtful whether their use is to be recommended generally.

Photographic Silhouettes.—A number of charming photographic silhouettes, produced by E. Stumman, a Russian photographer, is excellently reproduced in the last number of the *Phot. Correspondenz.* Mr. Stumman describes his mode of working as follows. Two dark coloured backgrounds are required, which are placed parallel to the glass side of the studio at a distance of about 3 feet from the latter and $5\frac{1}{4}$ feet distant from each other. The two backgrounds are covered with a black cloth, which then forms the roof of the tunnel produced. In front of one of the openings of the extemporised tunnel is placed

a perfectly white background at a distance of 3 feet, so that it reflects as much light as possible. The size of the white background corresponds to the size of the opening of the tunnel, or it may be a little larger. The sitter is placed in the centre of the tunnel, the face directed to one of the parallel backgrounds, but nearer to the white background, so that the side of the face directed to the camera is shaded as much as possible. The annexed sketch gives an idea of the arrangement.



A A the glass, or light side; B B two parallel black backgrounds; C the white background of an inclined plane; D the sitter; E the camera. As the white background reflects plenty of light to the camera, a very short exposure is sufficient.

A New Sensitive Positive Paper.—On behalf of Mr. A. Moll, of Vienna, Mr. von Zamboni has tried the new iridium paper, introduced by a French firm. It is a printing-out paper similar to the gelatino-chloride papers, and is said to give prints of the character of platinum prints; but it keeps better than the platinum paper, and is much cheaper. After removal from the printing frame the paper is washed in several changes of water, and then placed in a toning bath consisting of—

Chloride of gold	1 part
Bicarbonate of soda	3 parts
Distilled water	6,000 ,,

The toning bath should be prepared a few hours before use, but it keeps for any time. According to the duration of the action of the toning bath various tones may be produced. At any rate, the toning proceeds quickly, a rich sepia tone being obtained after the lapse of a minute, a bluish one after 1½ minute, and a velvet-brown tone within about two minutes. The prints are placed, after toning, in the fixing bath, consisting of—

Hyposulphite of soda	8 parts
Water	100 ,,

After about ten minutes they are removed and thoroughly washed. Mr. von Zamboni has found that the prints may as well be treated with the combined toning and fixing bath which is used in connection with the gelatino-chloride papers. They are placed in this bath directly after removing them from the printing frame, and allowed to remain in it until the desired tone, varying from sepia to brown, has been obtained. The paper is prepared with chloride of iridium; it keeps, if protected against moisture, at least six to seven months, and its sensitiveness is about equal to that of the gelatino-chloride printing-out paper.

Liesegang's New Phonograph.—An ingenious invention has been made of late by Mr. R. Ed. Liesegang in connection with phonography, showing clearly how the photographic camera and the phonograph can be made mutually helpful. It will be known that in Mr. Edison's phonograph the phonogram is recorded on a cylinder prepared with a wax solution. The wax film being, however, very delicate, it has been found in practice that this feature of Mr. Edison's apparatus renders its general introduction difficult. In Mr. Liesengang's phonograph the wax cylinder is entirely omitted, the sound-curve being written by means of a drawing-pencil on a paper or blackened-glass support, and the writing being afterwards made conductive by photo-chemical means. The arrangement of the apparatus is about the following. A diaphragm which is set into vibrations by sound transmits them to a lever, at the end of which the drawing pencil is fixed. The latter writes the vibrations of the diaphragm on an enlarged scale down on a sheet of paper or on a blackened-glass plate, evenly driven by clockwork. At the same time, a fixed pencil attached to another lever at the side of the first one records on the support the progress which is made by the paper or by the glass plate.

(*a*). Line drawn by the fixed pencil.
(*b*). Sound-curve transmitted by the diaphragm.

If the phonogram is recorded directly on paper, an ink is used for writing, which consists of a metallic salt which is easily reduced. If, however, a blackened-glass plate is employed, a photographic impression is taken from it on sensitised paper, after the image has eventually been previously enlarged. The printing process suited best for this purpose is the carbon process or the collotype, a well-conducting metallic powder being substituted for the carbon, which is mixed with the printing ink if collotype is applied, or dusted on if an impression in fatty ink is made. The prints can then be stored in book-form. To transform the curved lines into sound-waves again, a very thin platinum wire is used, being a little larger than the largest distance between the two lines recorded by the apparatus. A thick copper wire is placed around the platinum wire on its upper side, as near as possible to it, but isolated from it by a thin film of gutta-percha, a similar copper wire being placed around the platinum wire at its lower end. The two copper wires come up to another closely without touching one another. This instrument is passed over the lines with as even a pressure as possible, so that the copper wire at the lower end of the platinum wire is placed always over the straight line *a*, the copper wire at the upper end always over the curved line *b*. The electric current from the battery enters the lower copper wire, passes through a short way of the straight line, then through the platinum wire up to the curved line, and through the latter in the upper copper wire passed over it. Thence the current passes through a telephone of any construction, and runs back to the battery. It is evident from this description that the electric current has to pass through various extents of the platinum resistance, according to the form of the curvature, and that it is weakened thereby more or less, producing, consequently, the vibrations of the telephone-diaphragm.

A New Verb.—The new verb, "to kodak," is becoming assimilated. The Rochester edition of the *Elmira Telegram* of July 13th has an interesting article on the State Fish Hatchery, near Rochester, in which it incidentally mentioned that numbers of the finny tribe were attracted to the clear water surrounding the feeding house by the vibration of the meat-cutter, set agoing for the purpose, and successfully "kodaked," as were also a number of large salmon trout, in the act of jumping for food thrown to them.—*The Beacon.*

SPHERICAL ABERRATION, AND THE TREATMENT OF SUBJECTS BY FOCUS.

BY W. E. DEBENHAM.

As Mr. T. R. Dallmeyer remarks, in his letter appearing in your issue of the 18th inst., it is to be regretted that Mr. W. K. Burton is so far away from England for controversial purposes. One particular reason for this regret is, that readers who have not made such a special study of optical subjects as to enable them to go into the question and appreciate the arguments brought forward, may be induced by Mr. Dallmeyer's style of writing of "the errors into which Mr. Burton has fallen," of his having "certainly very much misunderstood the subject" of his (Mr. Dallmeyer's) article "for ever laying the ghost," and so on, to do injustice to Mr. Burton during the time that must elapse before he can reply.

The main question is, whether the planes not in focus are better defined when spherical aberration is introduced than when it is absent: whether, by sacrificing definition at the focal plane, better definition is obtained at the planes not in focus. The claim put forward by Mr. J. H. Dallmeyer, when introducing a certain lens to the public, was, that "by such diffusion, objects in planes wide apart were defined better, not simply relatively, but absolutely." The denial of this claim, made by Mr. T. Grubb and by me at the time, and I believe by Mr. Burton and others since, is the "ghost" which Mr. Dallmeyer would do well to lay, if that is possible.

I considered that Mr. Dallmeyer had practically abandoned the claim for improved definition when he recently admitted that, with spherical aberration, definition was worse on one side of the focal plane, but claimed that it was improved on the other. If the total range of definition is not greater, it is of very secondary consideration whether there is a little improvement on one side or the other, balanced by a decided diminution of sharpness on the opposite side. If, for instance, the eye of the sitter were focussed, some persons might prefer that, in accordance with Mr. Dallmeyer's latest contention, the back hair should be somewhat better defined, and the moustache more distinctly out of focus, whilst others might take the contrary view, and prefer the foreground plane represented by the moustache to be better defined, at the sacrifice of some additional fuzziness in the back hair.

If it is assumed that Mr. T. R. Dallmeyer's recent contention is correct, and that at the sacrifice of near objects distant objects are better defined with spherical aberration, and that to an extent that can be detected in the resulting photograph, there would still be no justification of the original claim, unless it could be shown that for planes wide apart the definition was better with the "diffusion" lens than with the other when both are focussed to get the best available definition on these planes simultaneously. Had Mr. J. H. Dallmeyer's claim been that now put forward by Mr. T. R. Dallmeyer, it is probable that neither Mr. Grubb nor I should have thought it worth while to discuss it. The claim was, however, for increased "depth of focus," a condition which cannot be said to exist if "increase" in one direction is counter-balanced, or more than counter-balanced, by "diminution" in the other direction.

Mr. Grubb, however, seems to have anticipated that such an argument as that lately propounded by Mr. T. R. Dallmeyer might be used "as a last resource," for after saying, "In short, in whatever way we make these comparative measurements, provided it be done fairly, we shall find the advantage with respect to 'depth of focus' to lie on the side of the corrected lens," he adds that it will probably be advanced that in the uncorrected lens—that with spherical aberration—the rays beyond the focus are more condensed in the centre than in the corrected lens, but that the antidote will be found at the opposite side of the focus where the rays are concentrated as much outwardly in the pencil as they are after crossing the axis concentrated inwardly.

Depth of focus does not mean an increase in one direction which may or may not be the more desirable one, accompanied by a counter-balancing or more than counter-balancing decrease of definition in the other direction. It means, as put by Mr. J. H. Dallmeyer, that objects in planes wide apart are defined better, and this is what Mr. Grubb and I have contested. Mr. T. R. Dallmeyer has inferentially, as I considered, abandoned this pretension. It would be well if he would either abandon it specifically, or re-affirm and prepare to defend it.

It would be no reply to affirm that when a certain plane is focussed as nearly as may be with a lens possessing spherical aberration, some particular background plane is better defined than it would be by a corrected lens focussed at its sharpest on the foreground. The corrected lens might be—and would be by a photographer desiring to secure these two particular planes—focussed at some intermediate plane, and if this can be done without more sacrifice in sharpness in the foreground plane than necessarily results from the presence of spherical aberration in the other lens, whilst the background plane is also as sharp as with the other, and the intermediate ones all better than with the "diffusion arrangement," there is clearly no greater depth of focus with the latter.

Mr. Burton's article in the current Year-Book, which originated the present discussion, is well worth the consideration of those interested in the question of sharpness in photographs. His main arguments are, I think, incontrovertible. A point less easy to concur with is the disposition to yield his reason and assent to the dictates of others in a point where, as he says, every argument they have produced is defective. This question, however, may form the subject of another article.

Wayzegoose.—On Saturday, August 16th, the employées of Messrs. Percy Lund and Co. held their wayzegoose at Morecambe. The party had engaged a Pullman car, which was attached to the usual Morecambe day trip, and arrived in Morecambe soon after nine. In the afternoon the company assembled at the Summer Gardens, where tea was provided. Fifty-five sat down, after which the whole of the party were photographed by one of the firm's employées. A short programme of vocal and instrumental music and recitations was afterwards gone through, and brief speeches were made by Mr. Percy Lund and others.—*Bradford Observer.*

Cleaning Soiled Engravings.—It frequently happens that fine engravings, notwithstanding every precaution, become soiled and stained, and a recipe for restoring them is valuable. Put the engraving on a smooth board and cover it with a thin layer of common salt, finely pulverised; then squeeze lemon-juice upon the salt until a considerable portion of it is dissolved. After every part of the picture has been subjected to this treatment, elevate one end of the board so that it will form an angle of about forty-five degrees with the horizon. Then pour on the engraving boiling water until the salt and lemon-juice are well washed off. It will then be perfectly free from stain. It must be dried on the board, or on some smooth surface, gradually. If dried by the fire or sun it will be tinged of a dingy yellowish colour.—*Wilson's Photographic Magazine.*

THE STATUE OF DAGUERRE.

BY JAMES MEW.

When the marble statue of the Komthur, or Commendatore, or Commander of the order of Knighthood in the fifth act of Don Giovanni, pale, and terrible, and solemn, stalks into the supper room of the libertine hero, and, with sombre majesty of demeanour, seizing him by the arm with his stony fingers, drags away that unfortunate man from what seems to be an exceedingly sumptuous supper, in the direction of a place not mentioned to polite ears, the spectators are commonly conscious of a feeling of commiseration which they would be scarcely likely to experience were some of our own public statues to be endowed with life, and in like manner to drag away those gentlemen who had designed, or carved, or cast them. The spectators of such an incident would regard it very probably with cool complacence, not only devoid of any sentiment of remorse, but with some slight satisfaction arising from a sense of the general fitness of things, and the recognition of a late but wholly righteous administration of retaliative justice.

A statue, it is said, is about to be erected to Daguerre in front of the Smithsonian Institute at Washington. It may be permitted us to enquire why in front of the Smithsonian Institute? Our ignorance is complete as to the nature of the Smithsonian Institute, but we hope and charitably suppose that this Smithsonian Institute may be in some way connected with the photographic art. For it is occasionally necessary to reverse the aphorism of De Ségur, and say that statues, like men, should be seen in their proper places. That they are not always so seen our own metropolis bears pregnant proof. "Things" which it would be polite and moderate to call only ill-natured, have been said about our own statues and their positions. These "things" it is, happily, wholly needless to recapitulate. A statue has now, indeed, become a doubtful mark of honour, and it is much to be desired that the ghost of the deceased Daguerre may have no cause to regret this public recognition of his artistic service.

Rollin relates that some good folk one day enquired of Cato why, in a country adorned with so many statues, not a single statue had been erected in his honour? To which that stoic philosopher is said to have replied that he preferred that people should ask why he had not a statue, than why he had. About the deserving a statue, supposing it to be a desirable award of honour, there can, in the case of an inventor of photography, be little doubt or discussion. It is needless at this time of day to expatiate on the many advantages which this wonderful art has conferred upon almost every section of the globe—an art for which nothing is too high and nothing too low, an art which is no less interested in earth and its most delicate organisms, than in heaven and its most distant stars. It shares, indeed, with the steam engine and the electric telegraph, the honour of being, in the words of the Photographers' Association of America, one of "the three great discoveries of the age." The close of its first half-century of existence is to be commemorated by a statue of Daguerre.

In what position is the great photographer to be presented? Sculptors are, as the public knows to its cost, compact of idiosyncrasies. It may be the sweet will of the glyptic artist to seize the forelock of the present occasion to deliver to posterity a portrait of Daguerre on horseback, or seated in the magisterial siege, but neither the cavalier nor the occupant of the curule chair is a statue in the strict etymological sense of the word. A statue is clearly something standing, not sitting, whether on a horse or on a stool. The first statues, from which our present expression "stiff as a statue" seems to have been derived, were always upright, with joined feet, legs well glued together, and arms perpendicularly pendant on the figure's sides. Such, according to Grimm, was the original statue, whether the material were gold, or silver, or marble, or bronze, or wood, or clay. It represented man in the dignity of his nature, not prone as other animals, but erect and raising his face to the firmament.

It will be interesting to learn whether the artist who has Daguerre's statue in hand has considered the chair, or the column, or the curtain, or the book, which are almost constants in the old Daguerreotypes, in any way necessary or advantageous to the monument of him who pictured them. There is no doubt that in any case the utmost pains will be taken to secure a personal resemblance, so as not to detract in any way from the privilege of the statue to be the nearest of all copies to the object it represents. In this respect the verbal description and the picture are of inferior power, and though the latter, like the statue, can speak in all languages, yet the statue alone, of all the secondary pleasures of the imagination, as Addison has called them, can convey, by the sense of touch, information and delight.

Louis Jacques Muadé Daguerre was born at Cormeilles, in the department of Seine-et-Oise, and began the earning of money for the support of that life to which his parents had assumed the responsibility of introducing him in the somewhat prosaic employment of an inland revenue officer. But the artist in Daguerre soon rose superior to the accountant, and he deserted the inquisitorial inspection of kegs for the more congenial occupation of painting the visions of his imagination upon canvas. He became a scene painter for the Opera at Paris, and in his remarkable power of exhibiting the effects of light and shade, threw into the latter not only his predecessors, Munich and Bibiena, accomplished as they both were, but also his own tutor, Degoti. The Chapel of Glenthorn, at the Ambigu, and a pellucid picture of sunrise in "Les Mexicains," are still quoted as the most marvellous of his inspired manifestations. He supplemented his theatrical work with panoramic views of Athens and Jerusalem, of Rome and London, and other great cities, and followed step by step the leading genius of his life, the spirit of the contrasts of light and darkness, in a dioramic exhibition which he opened in Regent's Park. The picture of a Midnight Mass at the Church of Saint Etienne du Mont was his penultimate effort before he appeared as the inventor of the Daguerreotypic photography.

Hos ego versiculos: It was I who wrote these little verses. A stormy autumn at Rome, some nineteen hundred years ago, on the occasion of a spectacular exhibition of the time, when the storms confined themselves—as people in these later degenerate days have often wished, when bent on pleasurable excursions into the country, that storms would confine themselves—to the night, and in the morning all again was bright and fair. And Virgil, then a young man, wrote in Latin the following lines, and placed them high on the theatre of the spectacles and sports, where all who ran might read—

> "Rain rules the night, with day our sports arise,
> So seems it right in Jove's and Cæsar's eyes."

And those who read inquired after the author, and one

Bathyllus, a poetaster, not devoid of audacity, rose up straightway and said, "I am the man," and received in due course royal flattery's rich reward. Then Virgil grew wroth, and wrote under the lines, "I wrote these lines," and left a blank space, and then "For others so," four times repeated, and left after them four blank spaces, one in every line, and publicly asked Bathyllus to fill up the blank spaces. Bathyllus, finding himself in an intellectual quagmire, with floundering thoughts which in vain attempted to gain a poetic foothold, gave up the attempt in despair, and so, we are informed with some looseness of logical deduction, was found to be an impostor, and Virgil gained reputation, an inadequate substitute, perhaps, for the payment already secured by Bathyllus, by concluding his commenced verses thus:—

"I wrote these lines—the laurels others bear,
For others so—steers drag the heavy share,
For others so—bees stock their cells with care,
For others so—sheep fleecy raiments wear,
For others so—birds build their nests in air."

It is an old story, but it comes pat to the purpose, for Niepce, of Châlon-sur-Saône, and Daguerre, of Cormeilles, in the matter of the founding of photography stand in somewhat the same relation to each other as Bathyllus and Virgil, though which is Bathyllus it is no easy matter to determine. It seems that Nicéphore Niepce, who, since 1814, had been seeking a means of obtaining permanent pictures by the sun's assistance, learned in 1826 that Daguerre was similarly occupied. These are the dates given by the historians, but, of course, they are a little difficult of proof. We are told that in the following year Niepce communicated to Daguerre particulars of his own method of fixing the images produced in the camera lucida by making use of metallic plates "coated with a composition of asphalt and oil of lavender; this, when acted on by the light, remained undissolved when the plate was plunged into a mixture of petroleum and oil of lavender." The two investigators, it is fairly certain, continued to labour conjointly in the production of their photographs, or, as they called them, heliographic pictures, from 1829 till the date of Niepce's death in July, 1833. Daguerre, building on the solid foundation of their joint travail, erected some little time after his fellow student's death the edifice—since so much enlarged—which he called after his own name. A chief point, it has been well said in favour of Daguerre as the discoverer of photography, lies in his familiar development of the latent image by means of the vapour of mercury, which he discovered, we are told, by accident. That the French Government had some doubt about the relative merits of Niepce and Daguerre appears clearly from their consideration of a bill according to the provisions of which Niepce's heir was, on certain conditions, to receive an annuity of 4,000 francs. But the discoverer of photography must depend upon what is understood by those words. Schulze may have this title, and Thomas Wedgwood and Fox Talbot, to whom is owing the first transparent paper negative. History, like many other matters, suffers from the bias of patriotism.

Daguerre died in July, 1851, at Petit-Brie-sur-Marne, a suburb of Paris. Two books written by him will interest the photographer, his "Historique et Description des procédés du Daguerréotype et du Diorama," published at Paris in 1839, which passed through several editions, and has been translated into English, and an octavo work published at Paris, in 1844, entitled, "Nouveau moyen de préparer la couche sensible des plaques destinées à recevoir les images photographiques."

ARTISTIC EDUCATION FOR CHILDREN.*

BY ADA M. LAUGHLIN.

All children should be taught enough drawing to be able to express themselves readily with the pencil; not with the purpose of making artists of them, but because such power is an enrichment of ordinary daily life. This study awakens an appreciation for beauty and truth, and leads to higher ideals in conduct and workmanship. There is a yearning toward beauty in form and colour as well as in sound and morals, and it is to this upward tendency of the mind that the wise educator will address himself. The higher our conception of material beauty, the higher will be our ideal of moral beauty.

We, as a nation of peace, maintaining the smallest standing army in the world, in our public education are doing nothing compared with Europe to advance and ennoble peaceful occupations. What is being done in America toward fitting the people for adjustment of their relations to peaceful labour is being done wholly by private enterprise. Pratt Institute in Brooklyn, whose varied work is illustrated so beautifully in our city to-day, is maintained wholly by private enterprise, and is training 1,500 young people to self-reliance and skill, the expense to them being merely nominal. Mr. Philip Armour, of Chicago, has in view the establishing of a similar enterprise in his own city.

With the diminution of hours of labour for the working man rises the demand as to how he shall spend his time. Because more leisure is coming to people, we must create, foster, and nourish the desire for pure and elevating amusements, and this fostering of correct tastes must be begun in childhood, and cared for under the state and civil authorities. Few studies can claim to do as much as music and drawing toward advancing children in paths of peace, obedience, and order, giving them present happiness, future occupation, and a constantly elevated enjoyment.

America must not judge herself nor her arts by standards of Greece and Rome, for the conditions of life now are vastly changed and much improved. We cannot do, even if it were a thousand times better worth doing, anything well except what our American hearts shall prompt and our American skies teach us, for all good workmanship is the natural utterance of its own people in its own day. The art life which is the result of this new industrial activity will come from the sure and gradual elevation that is the necessary outgrowth of universal purity of thought and action. Inspired by the purpose to educate and thus redeem the masses, to awaken and stimulate an appreciation of nature as the externalisation of God's thought—dominated by the Christian idea—the leavening of the entire lump, the nation's aim shall be, not the development of intellect for intellect's sake, nor science for science's sake, nor art for art's sake, but everything for humanity's sake—to make humanity godlike.

Prices of Paper and Platinum Salts.—Mr. Otto Scholzig writes that owing to the continued rise in price of silver nitrate, he has been obliged to raise the price of his sensitised paper by 10s. per ream. The price of Dr. Jacoby's platinum paper has also been raised from 2s. to 2s. 6d. per sheet, owing to the high price of platinum salts.

* A paper read before the American National Convention of Teachers at St. Paul.

SUCCESS IN PORTRAITURE.

I am going to offer a few more remarks upon the portrait branch of photography, and I will ask all experienced workers to give what I have to say the go-by, recollecting that, while what is here told may be familiar enough to them, there are a great many enthusiastic ladies and gentlemen providing themselves with cameras every day, and scanning photographic literature for help, to whom assistance will, I am sure, not come amiss.

There are a few broad principles underlying success in the taking of portraits, which, if properly understood at the outset, lead rapidly to success, and without a knowledge of which the aspirant will inevitably waste his time and materials, and find himself disposed to set aside in disgust an occupation which ought to prove, with proper guidance, an endless source of interest and pleasure to himself and his friends.

First let us call attention to the importance of simplicity in our arrangements and effects. In mechanics, it is well understood that simple contrivances are generally better than more complicated ones, but the mistaken impression seems now to prevail in relation to artistic productions, that the more complex and over-crowded they are, the higher they must stand in the scale of excellence.

The mind should be impressed, not distracted, and a work of art, to be impressive, must tell its story simply and directly. Its objects should be suitably grasped, and its light and shadow collected into broad masses. All that we admit, as we proceed, to give fulness and interest to our subject must yet remain subservient to the larger and simpler parts, and it must be constantly remembered that the more we introduce by way of embellishment, the more we are likely to drive away the attention, and destroy the breadth and unity of purpose in our picture. When we set out to make a portrait, we must bear in mind that the head and bust of the individual are the aim and end of our work. Anything else that is introduced must not only be entirely subservient to this main end, but should be as far as possible in harmony with it.

It is very difficult to secure about residences and homes generally the breadth of lighting and repose of background that are necessary to the production of a good portrait, and it is for this very reason that I am particularly induced to urge the necessity of bestowing a little time and pains upon a few necessary arrangements before attempting to expose plates upon heads.

First, as to the matter of lighting. Good portraits can never be made in any situation where the lighting does not extend above the level of the head, because all under-shadows are destroyed, and the important modelling which gives expression is lost. For the same reason, outdoor pictures taken in a diffused light are seldom good, and we may here add that, under the latter condition, it is impossible to secure a calm, tranquil expression, owing to the effect of the glare of light upon the eyes. Whether the work be attempted in an apartment or out-of-doors, the conditions should, in a general way, be the same, namely, the direct light should come upon the sitter as nearly as possible at an angle of forty-five degrees, and somewhat from the front. It matters little whether the amount of light be great or small. It may be merely what may proceed from a little window near the top of an apartment with a high ceiling, or the whole of an outdoor light which happens to be cut off eight or ten feet from the ground, and sheltered still higher on two sides. It will be seen that the former condition is absolutely unattainable in an apartment with a low ceiling, while the latter may readily be got in the city, in back yards where there are high walls and high board fences with big spaces of overhead light, and in the country where walls and shrubbery very often give us virtually the same conditions.

Heads taken under porches can never make good pictures, because all the overhead light is cut off, and if the sun happens to be shining upon the floor of the porch or light earth in front of it, we have a lighting precisely analogous to that produced by the stage footlights upon the players, which is abominable to artists.

After lighting, the next most important matter is to see that we secure a quiet background. The beginner in portraiture is apt to be so absorbed in his sitter that he rarely thinks of what may happen to be back of the latter, and if there should be a combination of strongly-defined objects near enough to be in focus, the head is lost in them, and the picture is spoiled. It so rarely happens that we find a quiet space in front of which to pose a sitter that it is much better to provide ourselves with a suitable piece of quiet, grey drapery, or to stretch some muslin on a slight frame a couple of yards square, and tint it with a coating of distemper, and this gives us the additional advantage of being able to grade our background from a light tint on one side (or corner, rather) to a darker at the other, which not only varies it and prevents monotony, but will enable us to relieve the light side of our head by a dark ground, and *vice versa*.—*American Journal of Photography.*

Decomposition of Eikonogen.—Eikonogen in crystals kept for a long time becomes greenish in colour, then black. This partial change does not prevent its use as a developer. The solutions then obtained have a more or less green colour, whilst the substance freshly prepared yields solutions of a pale yellow. It is easy to remove from the affected mass the portion which has remained uninjured. Make a cold and very neutral solution of sulphite of soda—that is to say, containing less than 500 grammes of the salt for 1 litre of water; boil, and add an excess of the affected eikonogen reduced to powder. Agitate with a glass rod until complete solution. Decant, and cool rapidly the liquid in a bottle exposed to a flow of cold water, and continually agitating, so as to avoid the forming of large crystals of eikonogen, which rapidly crystallises. Filter the whole and wash the crystals on the filter with a little alcohol. Allow the mass to dry, and we have an eikonogen that is almost colourless.—*Journal des Sociétés Photographique.*

Solar Activity.—Prof. Tacchini gives the following results of solar observations during the second quarter of this year (*Comptes Rendus*, August 4):—

	No of days of observation.	Relative frequence of spots.	Relative frequence of days without spots.	Comparative area of spots.	Comparative area of faculæ.	No. of groups of spots per day.
April	19	2·08	0·75	1·40	10·40	0·44
May	20	2·55	0·54	2·58	25·83	0·71
June	26	1·35	0·76	0·86	8·10	0·25

A comparison of these figures with those of the first quarter of this year shows that the spots are slowly increasing in magnitude, and that the number of days without spots is diminishing. The following results have been obtained for the prominence:—

	No. of days of observation.	Mean number.	Mean height.	Mean extent.
			"	"
April	19	1·90	35·2	1·5
May	20	1·55	37·9	0·9
June	26	2·42	27·7	1·3

Notes.

The great statue of "Liberty Enlightening the World," on Bedloe's Island, New York Harbour, has been photographed at night by an enterprising Yankee by the aid of the magnesium light. A wire was stretched from the Torch of Liberty to the mast of a ship in the neighbourhood, and by this wire the pot containing the magnesium compound was slung under a pulley wheel, which was made to travel to the desired position. Twenty-four ounces of magnesium compound were used with an ounce of the pure powdered metal on the top, and the compound was fired by electricity from the electric light plant on the island. The photograph was taken from the dock on the east side of the island. The ambitious photographer who did this work was Mr. S. R. Stoddard, of Glens Falls, New York. The result is said to be much the same as if the picture had been taken in daylight, but the sky is darker.

Great preparations are being made in France, both by ecclesiastics and the laity, for the coming festival in honour of Joan of Arc, and soon a great change will come over the little village of Domremy, in which she was born. At present it is in its primitive state, but half a mile or more away is a new church on the borders of the wood in which she heard the voices; this church was erected from the plans of Parisian architects, and is a handsome structure. Before new national buildings are erected in the village itself, the latter should be well photographed from different points, although it is not a picturesque place, and is interesting chiefly from its historical associations. The little cottage of Joan of Arc, which has long been kept in order by the Government as a national monument, is about the most picturesque subject in the village; we photographed it once in a storm of wind and rain, which had kept on for two days previously, and then showed no signs of abating. The old church bears no resemblance to its representation in theatres; it is no majestic pile rearing its head in the moonlight, whilst the pealing organ adds to the solemnity of the scene, but it is an ugly little white building, like some of the plainest Little Bethels to be found in back streets in London; in front it has an ugly black statue of the Maid of Orleans. A narrow street runs by its side, and at the opposite corner to the church is a small *cafe*; French "Cheap Jacks," sometimes put up their travelling vans against the wall of the church, then turn their horses out to grass. The inside of the little church is interesting, but badly lighted for photographic purposes. Banners and wreaths, dusty with age, wrought by the hands of fair ladies in France, abound; many of these came from the great city of Orleans, which always turns its eyes with affection towards Domremy. This historical village is not an easy place to get at; it is down a branch line in the Vosges district, along which line a few slow passenger trains pass during the day; the nearest large city is Nancy. No authentic portrait of Joan of Arc exists. The oldest representation of her is a time-worn stone effigy in the wall of her cottage; if she bore any resemblance thereto, she was a rather pudding-faced, obstinate-looking young woman. It is doubtful whether Joan of Arc was burnt.

The East Dulwich and Peckham Photographic Society has changed its name to the South London Photographic Society—a title borne by an organisation of the past, which died after a long career of usefulness and of honour. The new Society seems to have taken the name of the old one of its own sweet will and pleasure—not that there is any actual connecting link between them. Having taken a good name, the new Society would do well to act up to the traditions connected therewith.

Our American brethren have a neat way sometimes of describing ordinary events. Recently, it will be remembered, Voigtlander had conferred upon him by the Emperor of Austria the Ritterkreuz of the Franz-Joseph Order. About this an American writer says:—"We congratulate Herr Ritter von Voigtlander, and trust that he may bear his honours meekly, and that the glitter of the knightly star upon his manly breast will not prevent him from continuing in his efforts to give us a perfect photographic lens. Farther, that the escutcheon of the new Baron Euryscope von Voigtlander may never be fogged by the Bar-Sinister, and that the results of his labours may always prove absolutely rectilineal and free from distortion, with a flat field and sharp definition."

Hogarth's illustrated moral story of the industrious and the idle apprentices is often called to mind by living illustrations which we see around us. The man who is conscientious and careful in his work gets to the top of the tree, while his fellow worker who is slovenly grovels at the root. We came upon a case in point the other day at a certain country town which boasts two photographic establishments. In one of them everything was spick and span, the reception-room was garnished with flowers, the specimens were good, and everything wore the aspect of prosperity. The other establishment was the reverse of all this, but perhaps the worst point about it was the sorry condition of the show cases which lined the entrance hall. The pictures could not have been renewed for at least a couple of years, and were afflicted with measles, yellow jaundice, and all the other ills to which photographic flesh—on albumenised paper—is heir. We learnt incidentally that the other man had all the best of the business, and we had no need to ask why.

The condition of the show-case is of the utmost importance to a photographer, and yet some seem to think that it is not worth troubling about, and that its proper rôle is to form an interesting exhibition of the fashions which were in vogue ten years back. Others, again, depend more upon quantity than quality, and cram their cases with hundreds of portraits, mostly of an

indifferent kind, as much as to say, "Look how many I take," instead of, as it should be, "Look at the excellence of my work." The best photographers know better than this, and are content to exhibit one or two really good portraits set tastefully on little easels. A real work of art will immediately attract a passer-by, who will stay for a moment to look at it, while the large collection of indifferent ones will only attract the idle residents of the place, who will point out Miss So-and-so, and criticise the portrait of Mr. Somebody else for the amusement of themselves and their companions.

The itinerant seashore photographer is, perhaps, the man who is most commonly blind to his own interests in exhibiting portraits which should be consigned to a photographic room of horrors. Poor fellow, he often lacks the means to alter this condition of things, and open air portraiture, generally done in blinding sunshine, is hardly conducive to good work. But even he might eliminate the pictures which have turned all kinds of colours except a pleasing one, so as not to advertise too strongly the want of permanence in his wares. He might, indeed, refrain from exhibiting any paper proofs at all, seeing that his work is wholly on ferrotype plates; in fact, he goes out of his way to show faults of manipulation.

While we are discoursing of faded prints, we may note a curious case of fading which came under our own observation a short time ago, for which it is difficult to discover any sufficient cause. We have in our private album the portrait of a child which was taken about twelve years ago by one of our best professional workers, one whose honoured name is known throughout the photographic world. It is covered with spots, has turned to a sickly yellow hue, and is altogether a most miserable example of a faded silver print, while the rest of the pictures in the book—some of much older date—are in fair condition. In a friend's album we lately had an opportunity of seeing another copy of this same picture which was printed at the same time, by the same hand, and presumably with the same materials. It is as bright and good in every respect as the day it was printed. This second picture, too, has been kept in an album, but why the difference in their appearance?

Automatic photographs are still in the dim and distant future. The statutory meeting of the company, which was held this week, did not disclose much which was cheering either to the shareholders or the public. Though the company has been in existence nearly three months, not one of the machines has yet been placed, nor could the chairman state exactly when it would be. He hinted somewhat vaguely at about thirty days; so that at the earliest the public cannot have their photographs taken for a penny until the autumn is well advanced. As light will have been considerably reduced in its actinic value by that time, and is likely to get worse during the next four or five months, a considerable proportion of failures may be expected. It is to be hoped, when an irate sitter fails to obtain a flattering portrait or even no portrait at all, that he will not wreak his vengeance upon the unoffending machine. Possibly the directors had some fear of this kind before their eyes, as Lord Kilmorey, the chairman, spoke of a new lens which was being constructed, by which photographs would be taken in a dull light equally as rapidly as in a good one. Photographers will be delighted to hear of this. In fact, what with the "secret" chemicals which the company is going to supply them with, and what with the new lens which it is about to introduce, the Automatic Photograph Company promises to be quite a benefactor to the profession. The curious thing is that it is so modest in offering the said chemicals for sale. We should be very glad to hear of a single photographer who has been able to secure a single pennnyworth. Mr. W. E. Debenham addressed the chairman on the question of the price of the chemicals, asserting that what the company was going to pay a halfpenny for would cost but the sixteenth part of a penny. The chairman, however, discreetly avoided answering the question, and the world is still left in darkness as to what the "secret" of the company is. No doubt in time the shareholders will discover for themselves.

The President of the Photographic Convention has been taken to task for his statement that "colour printing in photogravure will produce water-colour drawings with a fidelity so great that it must deceive even the artist of the original drawing." While admitting the great advance made in fine art progress by the aid of photography, the critic of the *Sunday Times* doubts if the almost infinite gradations in tone and tint of a good water-colour can be exactly reproduced. It is to be hoped that the critic is right. The possibility of reproducing a water-colour drawing so faithfully as to deceive the original artist places a dangerous power in the hands of unscrupulous persons, who are always ready to avail themselves of a chance of piracy in art.

Photography has invaded the music hall. We do not refer to the photographs of the lion comique, the sister ducttists, and the marvellous acrobat, with which the entrance halls are plentifully ornamented, but to the comic song. The latest effusion is sung by a young lady in a fancy costume who comes on the stage holding a bundle of cabinet photographs in her hand. The song is of a topical character, each verse relating to some well-known personage, such as the Prince of Wales, Mr. Gladstone, and others, but without any mention of the name. The key to the allusions is given by showing the photograph of the person sung about, with the refrain, "Do you not think so?" to which the audience are expected to reply with a stentorian "Yes." The song seems to take, whether through the popularity of the personages, or the exhibition of their photographs.

THE KEEPING QUALITIES OF GELATINE PLATES.

The question is often asked, How long will gelatine plates keep? And the answer, of course, must depend on the experience of the particular individual, or on evidence gathered from the experience of others. As every item of experience in this direction must be of more or less value, we proceed to note down a few facts, impelled thereto by the result of an experiment made to-day—a repetition of a series made at intervals during the last five years. The experiment was simply the exposure of a plate on a fairly well lighted subject, with *f*/22, for a little less than a second, and its development into a fairly good negative, with a solution of pyro three grains and sodium carbonate twelve grains, in about eight minutes; the history of the plate alone giving interest to the experiment. During 1875-6-7 we had been experimenting extensively, numerically at least, with gelatino-bromide emulsions, and naturally accumulated a large quantity of "bottoms" when the results were promising, and larger quantities when the experiments were, as happened more frequently than not, unsatisfactory. Our method was to make batches of five ounces, no two of course being made alike, and after coating a number of plates, and otherwise examining each batch, the remainder was set aside in a dark closet in the laboratory. By the August of 1877 the shelves of the closet became crowded with bottles aggregating sufficient to fill three Winchester quarts—a gallon and a half—some containing alcohol, some carbolic acid, some salicylic acid, thymol, &c., and all with varying proportions of iodides and bromides, and made at different temperatures and with shorter and longer subjection to the "cooking" process. Some samples were white and solid, apparently unchanged, while others were of the consistence of thin syrup, dark as molasses, and smelling abominably.

The whole was turned into an earthenware jar as the first step toward the recovery of the silver, and as it occurred to us that the haloid salt could not be injured, or probably changed to any great extent, by contact with the decomposed gelatine, we placed a few ounces in a water bath and added sufficient of Heinrich's gelatine to make a firm emulsion. This was set and thoroughly washed in the ordinary way, melted, and a few plates coated, which, on exposure and development, proved, to our surprise, to be in every respect excellent, and very much more sensitive than any one of the samples, or than any emulsion that we had heard of. The experiment was repeated on a larger scale, and about a gross of plates coated, all of which, except three dozen, were used in our ordinary course of practice. The three dozen were put up in packets of four, each pair face to face, and wrapped in yellow paper, the common commercial yellow demy, two half sheets being employed for each four. Each three packets were placed in boxes made to order, and of a better quality of board than is now used, and the boxes were simply wrapped in brown paper and fastened with a string. In this way they remained until 1885, having in the meantime made three voyages across the Atlantic, and on one of the boxes being opened and a plate tried it was found in good condition and apparently as sensitive as at first. From time to time, from then till now, the experiment has been repeated, and the plate exposed to-day is apparently in as good condition as its neighbours were thirteen years ago.

On critical examination by an expert, the plate would not be pronounced equal to those by our best makers at the present. The negative is on the thin side, and slightly wanting in contrast. This is caused partly by over-exposure, no doubt, but it also arises in part from lack of silver, emulsions being less rich then than now. A careful examination also shows at one end and one edge a faint trace of the well-known metallic appearance that some plates assume even within a few months after being made, but it does not extend to the breadth of the rebate, and the picture is clean, crisp, and full of delicate detail, without trace of fog or other fault.

We believe the fact that these plates have retained their good qualities for such a length of time is due mainly to the way in which they were packed. The only objection to their being placed face to face is the possibility of their being scratched or rubbed; but when tightly bound together in fours—perhaps twos would be better—each packet is as solid as a single plate, and, while there may be vibration between the packets, the surfaces are not injured.

Some of the negatives made on the thirteen years old plates are in our office, and will be shown to those who are sufficiently interested in the matter to favour us with a call.—*The Beacon.*

A Transformation of the Physiognomy.—Physiologists assert that a married couple having reached a certain age, having ideas in common, in sympathy with each other and leading the same life, end by resembling each other facially. The Geneva Photographic Society has taken the photographs of seventy-eight couples to see to what degree this resemblance is developed. The result was that in twenty-four cases the resemblance between husband and wife was greater than between brother and sister, and as great in thirty cases.

Silver Malonates.—G. Massol.—This salt, $C_6H_3O_8Ag_2$, is obtained by the double decomposition of potassium malonate and silver nitrate. It is a white or faintly yellowish powder formed of fine microscopic needles which blacken on exposure to light. When dried in the open air, but in the dark, it yields 67·11 per cent metallic silver. If heated it blackens slightly, takes fire, and burns with brisk deflagration, leaving a residue of metallic silver. It is slightly soluble in water; at 20° 1 equiv. dissolves in 559 litres of distilled water, absorbing —9·8 cals. The formation of this salt by double decomposition is accompanied with a liberation of heat.—*Comptes Rendus.*

Electioneering Photographs.—Mr. G. T. Teasdale-Buckell, editor of *Land and Water*, is circulating the following letter among country Conservatives:—"I intend to publish some special editions of *Land and Water* relating to your county, and in each of these editions I desire to give the photograph of a Conservative or Unionist member of Parliament, or a candidate for the next Parliament. The photographs will be done in the best possible manner, and for this purpose it is necessary that the sitters should be taken specially for the purpose. I have already had a number taken, but many members have sent me their photographs previously taken which I unfortunately cannot use. It is my intention to deal extensively with the industries of your district by the assistance of experts, and to get out the photographs and literature some time in advance of the next general election, so that when this event does occur reprints of the photographs and literature can be made, if desired, and sold at a low price—perhaps 1d. The photographs will be superior to anything ever published in a newspaper. My object in writing to you to-day is to ask you to induce your member to call on us for this purpose at the earliest possible date, and before Parliament rises, if possible, as I cannot start with your county until I have taken the whole of its Conservative and Unionist members and candidates. I think that the earlier it is done the less like electioneering it will appear if it should be reprinted at the time of an election."

THE CAMERA THE HISTORIAN OF THE FUTURE.

BY JULIUS F. SACHSE.

Among the manifold uses of the camera and photography in the various departments of the sciences and arts at the present day, both as a profession and pastime, no field opens wider nor shows greater possibilities than that of photo-historiography. With the great improvements which have lately been made in portable apparatus, and the simplification of the various manipulations and formulæ, together with the perfection of permanent processes, photography is destined soon to take its place, we may well say, as the historian of the future. The camera, with its great recording eye, will not alone pictorially depict the passing events of the day, but retain the appearance of the fast crumbling landmarks and monuments of the past; it will duplicate the features of the present generation, as well as permanently renew the old fading portraits and yellowing parchments, thus preserving them for the students and searchers of the future. That such photographic records will before long become the one thing needful in connection with every country, society, or other body having any interest in its history being handed down to posterity, will be apparent to all.

This fact is being recognised in different parts of the world. We already read of photographic surveys of various localities, castles, and historic buildings in England; of the "Ausflüge" of the photographic societies in Germany; the efforts made to reproduce old paintings, documents, and engravings in Vienna; the glorious photographic detail survey of the Basilica of St. Mark, at Venice, in Italy, consisting of six hundred and fifty plates in five large portfolios, executed under the patronage of H. R. H. Margaret of Savoy, Queen of Italy, the work having been commenced in 1878 and completed in 1885, by Fernando Ongania, and a large corps of assistants. The majority of these plates are reproduced by the heliotype process; others in colours by chromo-lithography. How thoroughly the work was done may be surmised from the fact that the entire facade was divided into twenty-one sections. Yet so exact is the work that the plates fit together exactly, forming one large picture, 8 ft. 9 in. long by 5 ft. 9 in. high. This valuable collection of plates shows completely all the decorative features of both the interior and exterior of the grand ecclesiastical edifice. Every detail being taken directly from the actual object by the camera, and reproduced by the phototype process in printer's ink, this collection, besides serving as a basis for any renewal or restoration that may be necessary in the course of time, will transmit to students in all parts of the world, as well as to posterity, a faithful record of the splendid ecclesiastical monument in the state of preservation in which it is found at the present time.

A somewhat similar work has been done on the Alhambra, in Spain; while from far-off Australia comes the news that some hundreds of photographs have been collected of the leading men who assisted to lay the foundation of Victoria, and which have been reproduced in uniform size, thus forming an interesting volume which, in time, will prove one of the most valuable historical records of the colony. In our own country this subject has not received the attention which it deserves; it is true a few individual efforts may have been made in different parts of the country, but in most all cases without any definite system, or without any intention to thoroughly exhaust the territory. A work of this kind, to be of future historic value, must be done conscientiously and intelligently, as well as in a systematic manner, and those who undertake the task should be thoroughly posted, not alone in the general and local history of the territory and subjects at which they wish to point their camera, but also train their eye for the salient and important parts, to say nothing about the picturesque bits of the subject, no matter how unpromising it may appear from an artistic standpoint at first sight.

In a work of this kind, negatives are apt to increase in number rapidly, and at the very outset, after the survey is completed, a new difficulty presents itself, viz., how to utilize the prints to the best advantage for future use and availability; and it is here where we must look to the expert book-binder, as well as the photographer or silver printer. As is well known, the regular albumen prints are so apt to twist or warp as to make them almost useless for book-work. Turning to the new "permanent" processes, where the plates could be printed on heavy plain paper, masked so as to show a wide margin, same as an etching or steel engraving, all difficulties were thought to have been overcome. This was notably the case with the platinum process, but here again a difficulty presented itself from the fact of the prints having to be developed in hot chemicals; the paper loses its sizing, opens the fibres, and becomes tender, and the white margin soon turns yellow. The same may be said of some of the bromide papers. Phototypes would seem to present the best results for our purpose, but as at present produced, and on account of the small editions, would be out of question on account of the expense involved. The welcome news, however, comes to us from Vienna and Paris that the process of producing these reproductions has been much simplified. In Paris, amateur outfits for "phototypie" are already offered for sale. If this process is practicable and cheap it may solve the problem, especially as there can be no question as to the permanency of printer's ink.

The first complete copy of a photographic survey which has been made in this country, so far as has come to the knowledge of the writer, was shown a short time ago at the rooms of the Historical Society of Pennsylvania. The subject was the old religious community at Ephrata, and consisted of fifty silver prints, 4 by 5, mounted on heavy cards, 7 by 10, a print being mounted on each side of the mount. They were burnished by a peculiar process, so as to overcome as much as possible the twist of the cards. These pictures reproduced all the different buildings still standing which had formerly been used by the community; the various interiors were also portrayed, together with the mystical inscription upon the walls; then came the various details of the construction, such as unique portals and quaint staircases; then followed some specimens of their peculiar musical MSS., so highly valued by all bibliophiles, the series concluding with the mossy and crumbling tombstones which mark the resting-place of these old religious pioneers, who unto death upheld their Sabbatarian doctrine. Between each two cards a page of heavy bond paper was inserted, upon which was engrossed a short sketch or description of the picture on the page opposite. A title page and full index preceded the illustrations. The mounts were hinged at the back, and the whole was bound in a rich morocco cover. The volume formed a unique book, which may well be classed as an "edition de luxe," irrespective of its great historical value. As a matter of course, the limited demand for any such a work would debar the average professional

from undertaking the photographic part. The same reasons apply to the printing of the descriptive pages or inserts.

In the meantime, until the difficulties which so far present themselves shall be overcome, we would suggest that wherever a photographic society or historical association exists, work of this kind should be encouraged, and some provision be made for preserving such negatives as may be given them, or means taken at least to obtain a print from any such negatives of value. These prints, when properly mounted, classified, and indexed, must prove of great value and interest in the near future.—*The American Journal of Photography.*

FIXING PHOTOGRAPHS.

BY ELLERSLIE WALLACE.

IT is now conceded by all good authorities on bromide paper printing that stability or permanency largely depends upon thorough fixation of the print. This same assertion has often been made concerning the ordinary silver print on albumenised paper, and is also quite true.

The conditions involved in the making of bromide prints are so different from those in silver printing, that it will not be amiss for us to compare them and see why the necessity for thorough fixation is so specially urgent in the case of the bromide print. Almost every one knows that the bromide print is made on a gelatine emulsion, while the silver print is made on a surface of albumen. The bromide print is the result of a process of development, while the silver print is "printed-out" as the phrase goes. The albumen forming the vehicle for the sensitive compound in the silver print is an exceedingly thin layer; while the gelatine, which correspondingly forms the vehicle for the sensitive salt in the case of the bromide print, is very much thicker and heavier. The gelatine layer absorbs a large quantity of water, and swells to still greater thickness during the development and finishing, while the increase of bulk of the albumen layer of the silver print when wetted is so slight that it may be practically disregarded. Lastly, the silver print depends for good quality largely upon the keeping of the picture upon the surface, while the bromide print is rather one of those kinds where the image penetrates more deeply.

For the benefit of those of our readers who have never made silver prints, we may say that one chief point requiring attention is the condition of the fixing bath of hyposulphite of soda. This salt, although highly soluble in water, is quite unstable chemically, and is particularly susceptible to decomposition in the presence of acids or acid salts. Every care is taken that nothing of the kind is introduced into the bath. When the prints are "reddened" by means of acetic acid, they are always well washed before reaching the fixing solution.

This brings us now to one of the points that we feel sure is often overlooked by makers of bromide prints. Everyone conversant with the process will remember that when the development is concluded, it is necessary to rinse off the developer with weak acetic acid in order to prevent foggy deposits and general discolouration of the print. The extreme weakness of the solutions generally used—say one drachm of the acid to thirty-two ounces of water—being overlooked, the prints are hurried into the hyposulphite without sufficient washing, and a highly undesirable decomposition is forthwith set up. The products of this decomposition are numerous; sulphur, sulphurous acid, and sulphide of silver being the chief ones. Supposing that the developer had been but imperfectly removed by the acid, there would also be more or less oxalate of iron present.

Even if the bromide print were thus carelessly and ignorantly made, it would nevertheless have fair chances of permanency when compared to the ordinary silver print. It has long been known that photographic images produced by development are more permanent in their character than those which are "printed-out."

But there is another point connected with the fixing of bromide prints that we must not neglect to speak of. If permanent results are expected, *time* enough for the hyposulphite to fully do its work must always be given. And it should not be forgotten that the hypo really has a double task to perform: first, to convert the unaltered portions of the gelatine-bromide of silver into a soluble form; and secondly, to take them up or dissolve them. Besides this, the process has to be done throughout the whole mass of a tough gelatinous layer that is comparatively slow to receive chemicals, but slower still in parting with them.

Those who can look back to the early experiments with gelatine negatives will remember how many failures were caused by imperfect fixation of the plates. To those used to working collodion plates, it seemed impossible that so long a time was required for thorough fixation. But painful experiences taught us what we now know about the matter.

Before concluding, let us give a few words of practical advice. If silver prints are being made, see that before fixing they are well washed free from acid, if this be used for reddening. Let the fixing bath be rather large in quantity, *not too cold* in winter, and see that the prints are well worked about in it. Twelve or fifteen minutes would be a fair time of immersion. If bromides are the work in hand, see that the prints are likewise well washed front and back in running water before laying in the hypo pan, and do not hurry the prints out when once they are in. The mere disappearance of the yellowish tint of the unaltered bromide of silver is not proof that the print is fixed. Additional time should be allowed, just as in the case of negatives, which cannot be safely removed from the fixing bath as soon as the shadows clear. Twenty minutes' immersion for the bromide prints would, in most cases, be none too long. The prints should never be allowed to stick together so that the solution will not pass freely between them, but, as we before said, they should be well moved about. Care must be taken that while doing this the soft gelatine surface is not injured or scratched. Silver prints will bear rougher handling, the albumen surface being thoroughly coagulated and hardened.

The first washing waters for both varieties of prints should be rapidly changed, and the prints not allowed to stick together in batches, or sink down to the bottom of the vessel, and lie on the bottom. Neglect of this caution in silver printing often makes yellow prints.—*Ibid.*

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Subject August 28th—Demonstration of Mr. Varley's Magazine Camera, and discussion on the uses and abuses of Hand-cameras; September 4th—"Pictorial Definition," opened by Mr. P. Everett. Visitors invited.

SNAP-SHOT PHOTOGRAPHY.*

The young man whom you see sliding along the street with a peculiarly shaped grip in his hand is not a commercial traveller, nor is he just about to begin a journey. Follow him at a distance, and you will see him glide into a hall-way, open his grip, pull out something that looks like a flat board, turn what appears to be a long screw, slam down the cover, throw up a diamond-shaped piece of leather in one end of the box, and then step jauntily into the street. Suppose it is in Mott Street that you encounter him for the first time. He appears to be watching the entire neighbourhood, and you might be inclined to think that he is a detective, with several assumed names about his person, except that he doesn't wear a cloak. Opposite the Chinese joss-house he stops, lifts his queer box up to the level of his breast, and lo! every Chinaman in front of the building takes a dive below, out of the way of impending danger; for he believes that the man with the grip is going to riddle the building. The mysterious individual has noted all this, but even while the pigtail of the last Celestial is whisked about as its owner disappears in the hall-way the man with the grip has pressed a button and his work is done. He has caught an exposure of the building and the flying Mongolians, and he knows that under good conditions he will have as a result of his labours a very good photograph of the joss-house. The mystery of the man and the box stands revealed in all its hideous proportions. Its owner is an amateur photographer, and the little grip is a detective camera.

It is astonishing to consider the number of snap-cameras now in use in New York. Turn where you will, you are likely to run against a man mooning around with one of these machines. He is relentless and terrible. He will take you so that you will appear in the worst possible light to your friends if only he can get you in a good one to snap his weapon. No cowboy in the wilds of Texas takes greater pleasure in punching an ugly steer than does this gentleman of the gelatine film when suddenly there bursts upon his vision a group of boys playing "craps," toughs discussing politics, Chinamen paddling about, or a pretty girl posed on a curbstone waiting for a horse-car.

The snap-camera man is not always skilful. In fact, he works for weeks before he can secure an exposure with that deftness and swift accuracy so characteristic of the veteran photographer. His first efforts, as a rule, are generally failures, and he spends a large share of his patrimony in plates and chemicals before he learns how to get a really good negative.

It was a Parisian who hit upon the novel idea of a detective camera. He made a small camera, which he concealed in his hat. A shutter in front was so cleverly arranged that the joint could not be seen. At first he used wet plates, but he soon saw the disadvantage he was labouring under. About that time the lightning dry plates were put on the market, and the Frenchman's hopes rose high. He could take his hat anywhere with him, and no one, at a glance, would suspect its double purpose. Placed on a table facing the person to be taken, the little button at the back could be pressed, and the exposure made. In some respects the hat camera was immeasurably superior to the toys now on the market.

The perfect detective camera should be all that the name implies, and the name manifestly becomes a misnomer when the camera is encased in a yellow wooden box. There are certain kinds of satchel cameras made that to all outward appearances are simply "grips," but by far one of the best of the late inventions is a camera in the shape of a book. It has three compartments, each supplied with a lens, and when a roll of gelatine film is placed in each section, the capacity of the book reaches 300 exposures. Carried under the arm, a camera of this description has such an innocent appearance that no one gives it a glance. It could be carried among a gang of thieves, exposures could be made, and the operator could depart without suspicion of the real use of his book.

Another detective camera that has met with considerable success lately is in the shape of an opera glass. It is really an opera glass with the larger glasses removed and dise plates substituted. The shutter is in the smaller end, and a nicely concealed spring operates it. The focus can be adjusted easily, as the screw in the centre is arranged for that purpose. Of course the negatives are small, but they can be enlarged by any of the many appliances known to the photographic world. Two meniscus lenses of equal focussing powers should be substituted for the concave glasses at the narrow end.

On the principle of enlarging, a neat camera has been invented which can be carried on the person and its presence remain practically unknown. It is placed inside the waistcoat, and the only external evidence is the lens, which is easily mistaken for a button. The picture taken by a camera of this kind is an inch or an inch and a half in diameter, and it can be easily enlarged without losing any of its essential details.

It might be well here to give a few pointers to amateurs who have recently supplied themselves with detective cameras. Never carry your box as though you were conscious of its ulterior purpose, or as though you were looking around for the express purpose of "snapping" some one. Strike an average focus, and in the quiet of some friendly hall-way set the shutter, open the slide, and take out the slide-plate, and there you are. When you are abreast of the object you desire to take, level the instrument on a line with your breast, touch the spring, and lo! once more, there you are! Then go along to another hall-way and readjust the plate slide, reverse the plate-holder, and once more you are ready to "scoop" another crowd. Do everything neatly and with the utmost despatch possible, and you will never be troubled. This rule is too often violated by amateurs, and they are subjected to all sorts of petty annoyance by street urchins.

An all-important fact in connection with photography lies in the illumination. There are good days and bad days; days when the sun shines so brightly that shadows are distinct and outlines are sharp and perfect. To obtain a negative under the best conditions the exposure should be made when the sun's rays have attained an angle of about 35° on an object situated about twenty feet from the operator, who should have the sun behind his back. The general tone of the light should be blue; a yellow, hazy atmosphere will never give a satisfactory negative.

Remember this, that while you have an apparatus that will work much better automatically than a slot machine, the success of the exposure depends mostly on your appreciation of the laws of light and shade. No matter how perfect a machine may be, good results cannot be obtained if the operator is not careful to observe the needs of the moment. The camera may be pointed too high or too low, directly in the sun's path, or the hand may press the button at the wrong moment, or with a tremor that will cause the shutter to slide unevenly.

The enthusiastic student of photography may obtain a good deal of amusement, and not a little knowledge, by experiment with the "paste-board camera," as it has been called. Take a long cigar box and blacken the inside. Make a pin-hole in the centre of one of the ends, and place a sheet of carbon paper beneath the lid and jam it down. If a 4 by 5 dry plate is placed at the end opposite the pin hole, with the sensitive side toward the latter, the lid jammed down and the box taken from the dark room to an open window, where there is a view of some building or other object, a very fair picture will be obtained on returning the box to the dark room and developing the plate at the end of half an hour's exposure. By interposing a meniscus lens the aperture of the pin-hole may be greatly enlarged, and the taking of the picture much quickened.

It may be added that thousands of good exposures are ruined annually by fault of developers. Not enough attention is given to this subject, and the result is a general condemnation of all the cameras in existence. The first and most important rule is not to permit a ray of light to enter the dark room; second, see that your hands are clean, and wash them thoroughly after each immersion in the separate baths. The trays should be perfectly clean, and that one used for the oxalic agent in the development of bromide prints should be used for no other purpose. The hypo is so cheap that it is really no saving to use a wash of it more than once. One of

* From the *New York Sun*.

the best developers has for its fundamental part a quantity of eikonogen, a German product, very costly, but quite cheap when compared with the work it does. After the plate has been developed it should be thoroughly washed in clear, cold water, and then immersed in the hypo bath until it is thoroughly fixed—say ten minutes. Then it should be immersed in a running bath of clear, cold water for half an hour, until all the hypo has disappeared. Then put the plate aside to dry, a process that cannot be hurried up if you want a good picture.

THE ABOLITION OF LONDON SMOKE.

THE dirt in the air of London and other great cities—which not alone forces the inhabitants to take filth into their lungs, but commercially injures professional portrait photographers in the winter months by increasing the time of exposing plates, because dirt in the atmosphere specially cuts off the actinic rays of the sun—will cause this letter by Mr. T. Howell Williams, F.C.S., L.C.C., to be of interest to our readers. We publish it but as one means, perhaps, of solving the problem. There are others.

MY DEAR WREN,—In reply to your enquiry of some months ago for a fuller explanation and a more detailed account of a scheme which I brought before your notice as to the abolition of London smoke, and the future prevention of London fog, I have much pleasure in taking this opportunity of placing before you further particulars regarding a project which, I believe, would result in the removal of evils that are a disgrace and reproach to a scientific age. I have observed that Lord Rosebery, in his recent able review of the first year's work of the London County Council, stated that "as regards fogs, which was a subject on which the Sanitary Purposes Committee had built some hopes, they found it impossible to make any practical suggestion." Both the questions of London fog and London drainage are serious problems, which the administrative body for the metropolis must face at some early day; and it is exceedingly probable that any further delay means not only additional expense to the community, but also a menacing danger to the comfort and health of Londoners.

The plan which I have the honour to submit to you at the present moment is one which possesses all the elements of practicability, and, I think, will deserve some consideration. Briefly stated, this plan is the production of gaseous fuel, for the use of Londoners and those who reside within the metropolitan district, at such a low price that it would be impossible in the future to burn coal economically in London. This would, I propose, be accomplished by making two kinds of gas—heating gas and lighting gas—*at the coal fields*, closely adjacent to the coal pits, conveying the same, when manufactured, to London in separate systems of main pipes; storing it in convenient gas holders, and then distributing it for the two distinct purposes of heating and lighting, thus making it a matter of absolute impossibility that coal should be economically consumed within the radius of the metropolitan district for the purpose of heating, and preventing its import as a matter of profit, tolerating specimens of the precious but uncleanly mineral as curiosities in our exhibitions and museums.

It will be a convenient method of laying the scheme before you if I proceed to discuss the question in the following order:—

I.—I shall endeavour to state and summarise the present odious disadvantages ensuing from the indiscriminate, ill-regulated, and wholesale combustion of coal in London.

II.—I shall next place before you the main lines of my scheme, leaving the *minutiæ* to be worked out later on when required; and I shall endeavour to sum up shortly the undoubted advantages which, I believe, it would bring to a patient and suffering public.

I.—*Disadvantages and Evils of the present System.*

It will be unnecessary for me, in the first place, to do anything more than state as briefly as possible what are the present disadvantages of London life in this respect. You have, in your able pamphlet on the "Causes and Cures for London Fogs," stated them more fully than I shall have the opportunity; and Dr. Alfred Carpenter, in his pamphlet "On London Fogs," has dealt also with the question in a comprehensive manner. Although it is true that a smoky atmosphere is the creation of modern times, yet it must be recollected that the question has always been one of public interest. From early times the citizens of London have been of opinion that the fumes produced by coal combustion corrupt the air, and are injurious to public health. In 1306, Parliament petitioned Edward I. to prevent that fuel being burnt, and it was made a capital offence to burn "secole" within the city, its use being permitted only in furnaces. It is said that a man was actually executed for burning it contrary to law in London; and it may be not difficult to imagine that, with the ever-increasing area of London, the fog nuisance will become so unbearable and injurious that a severe punishment will inevitably be provided for those who contaminate the already overladen air with the deleterious products of coal combustion under the present arrangements. Theodore Hook, fifty years ago, described London as that "sink of sin and seacoal." But of late years London fogs have been becoming more intolerable and frequent. The unhappy inhabitants are compelled to grope their way too frequently amongst the darkened streets, quite unconscious of the beautiful weather which may, perhaps, prevail only a few yards above the fog, through which the rays of the sun cannot even penetrate. Fog damages the public health. It fills the lungs with choking, repulsive vapour, impedes respiration, lowers the vitality of the individual, and fills the air passages with dirt, producing the most irritating sensations. It spoils our libraries; it injures our property; it diminishes the value and beauty of our public buildings. It corrodes and destroys the appearance of our perishable articles and pictures; and the gaseous, as well as solid, impurities which are to be found in the air give a most unpleasant taste, which prevents free breathing. Added to these discomforts, there are the exhalations of human beings and animals becoming concentrated in the great blanket overlaying the huge city. The money cost of each fog must be enormous and incalculable. Traffic everywhere is paralysed by it, precious time is wasted, and outdoor business practically is at a standstill. During its occurence, the prevailing discomfort is made worse by the thousands of fires kept up on the railways emitting black smoke, necessary, however, to keep the signalmen from perishing from cold. The metropolitan district area is over 300 square miles. "There are at least, probably, 4,000,000 domestic fireplaces in this area, and about 1,500,000 lighted fires of every description in full operation daily during the winter months. It has been estimated that about 30,000 tons are daily burnt in London. About 13,000,000 of tons are brought every year into the metropolis, and, taking the percentage of one-tenth of a grain of carbon to each cubic foot of smoke escaping from London chimneys, there are, perhaps, sixty tons of unconsumed coal hanging over London every day. An immense amount of unconsumed hydrocarbon is also wasted, owing to unscientific methods of combustion, principally due to the use of the old-fashioned English fireplace and cheerful hearth said to be so dear to the peculiarly conservative people of these realms."

With these ingredients hanging over us, there is mixed up such products of coal as tar, itself the most unpleasant quality in fog. It is asserted that 200 tons of sulphur—the principal portion of which is in combination with ammonia as sulphate of ammonia—are daily thrown into London air, involving an enormous waste, and representing a dead loss of a very valuable fertilising agent.

The injury to life which fog creates was seen in that terrible season of the winter of 1879-80. For six weeks, ranging from November to February, there was a continuation of dense and protracted fog, doubling the number of deaths; asthma increased 220 per cent., bronchitis 331 per cent., and in the week ending February 13th, 1882, the death-rate, owing to the dense fogs, rose from 27·1 in the previous week to 35·3,

diseases of the respiratory organs rising to 994, the corrected weekly average being 430.

The dangerous element in fog is the smoke. There is as much fog sometimes in the English Channel as in London, but a great difference exists between the two varieties. In the Channel it is a clear, white mist; in London it becomes mixed up with carbon and other ingredients, which come out of our coal fires, and on each little water particle there is a layer not only of carbon, but of sulphuric acid and other choking compounds which make the "London particular" so deleterious and objectionable. In an article on waste in the *Quarterly Review* of April, 1889, the "filthiness of smoke" is well set forth. The household waste brought about is incalculable. The injury to the poor is shown to be the result of the pollution of the atmosphere. They are condemned to live, or die, in continual obscurity and dirt. Their surroundings are steeped in a perenuial filth. They have been born to dullness; it seems natural and appropriate to them, and it increases just as they increase. This deluge of coal smoke is permanent and desperate. Four million people of all ages, similarly ill-conditioned, live in the smoke supplied by chimneys, and they demand to be liberated from their grimy misery. To Londoners, accustomed to their present cloud of smoke, it is hardly conceivable that seventy years ago their city was a bright and sunny town. In 1817 the residents in the then well-conditioned quarter near the "Angel," Islington, would, sitting in their gardens, watch the shipping at Blackwall; and fifty years ago a favourite summer evening's walk was to the slopes of Highgate, to see over London to the Surrey Hills, with Banstead Downs and Epsom Stand, the woods of Anerley and Shooter's Hill, and the returning Margate steamboats on the river. But I think enough has, perhaps, been said about the nuisance and evils of fogs.

Another direction in which we discover enormous waste is in the work and worry attendant upon the present system of coal combustion in open fire-places. We have all the evil effects arising from these fires, producing dust, dirt, and deposits of soot in rooms and houses. There is the daily problem of dealing with the ashes and refuse of the grates, the great amount of constant and unremitting attention which must be paid by domestic servants to the fires and the cleansing of the grates and stoves. Indirectly, the reform of these fire-places would act upon the great social problem of domestic labour. Many of the present infelicities of household life, caused by the carelessness and behaviour of domestic servants, could be removed by making them not so necessary as they are at present. An immense saving of labour would at once result in this direction, as it would also by the abolition of chimney sweeping and its accompanying discomforts.

The quantity of coal which is brought into the metropolis annually, as before mentioned, is about 13,000,000 tons. The cost of transit of this coal, together with the profits obtained by the middleman and retail dealers, amounts probably, in the aggregate, to at least six million pounds sterling. Here there is an enormous waste of money, capital, and labour which cannot well be avoided under the present system of coal consumption. Added to this waste, we have the additional disadvantages of coal bays, wharves, and stations in the heart of the metropolis. There are the grimy waggons and waggoners to be considered as adding to the dirt and discomfort of Londoners. The atmosphere is daily polluted by the supply of private houses and manufactories with this fuel. Large coal yards, and a hugh army of highly paid labourers are utilised in the trade, and thus we have a further direction in which enormous waste is found.

It can easily be shown how extravagantly wasteful Londoners are in the present method of artificial lighting and warmth. Most persons agree in the present discomforts and terrible unhealthiness of London during a foggy season, and sigh at the same time for remedial measures that will carry away the evils which I have endeavoured to sketch. Further than these discomforts, is the serious question of persistent waste of resources going on, threatening the material prosperity of the citizens as well as imposing physical burdens upon them. "If coal smoke were avoided by complete combustion," says the *Quarterly Review* (April, 1889, p. 372), "and were houses scientifically warmed, the saving in the cost of coal, and in the labour and sickness, the destruction and depreciation caused by smoke, would in one year yield all the sum that is immediately required to provide sufficient parks and playgrounds, gardens, boulevards, and avenues for the metropolis; and London would then be as bright and cheerful as it was three-quarters of a century ago." The main remedy must be sought in the reform of our fire-places, and in a more scientific consumption of coal, a small proportion of which is now only used in giving forth heat. Five-sixths at least of the developed heat is lost, and much of the fuel passes away unconsumed. Dr. Carpenter and others have proposed a tax in the nature of a hearth-tax. I venture to submit that the preceding disadvantages which I have enumerated, and the hostility to any hearth-tax, will be obviated by the scheme which I propose herein.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

12,519. W. W. Beasley, 128, Colmore Row, Birmingham, "Detective Cameras."—August 11th.

12,552. J. H. Berd, 12, St. Peter Street, Islington, London, "Vignetting Photographs."—August 11th.

12,613. Victor Freiherr von Kalchberg, 55, Chancery Lane, London, "An attachment to Guns for taking a Photograph of the Object aimed at."—August 12th.

12,699. J. Miller, Arcade Chambers, St. Mary's Gate, Manchester, "Cameras."—August 12th.

12,711. J. J. Foster and H. Flack, 53, Chancery Lane, London, "Lens Shutters."—August 13th.

12,734. L. C. Niebour, Clarence Street, Kingston, "Instantaneous Shutters."—August 14th.

12,741. E. Gundlach, 112, South Avenue, Rochester, U.S.A., "Photographic Objectives."—August 14th.

12,766. E. Bloch, 35, Southampton Buildings, London, "Photographic Apparatus."—August 14th.

12,814. H. A. L. Barry, 46, Lincolu's Inn Fields, London, "Photographic Printing Meter."—August 15th.

Specifications Published.

13,697. *August 13th*, 1889.—"The Preparation of Alkaline Cyanides." Hermann Gruneberg, Dr. Phil., Holzmarkt 25, Cöln; Hugo Flemming, Dr. Phil., 165, Haüpstr, Kalk; and Wilhelm Siepermann, Dr., Elberfeld.

If quantities of coal and alkaline carbonate are heated together to a dark red heat, and ammoniacal gas be added to the same, then a quantity of alkaline cyanate is formed together with a little alkaline cyauate; if the same experiment be made at a light red heat, then alkaline cyanate alone will be formed, but with less profit.

If, however, ammoniacal gas be first introduced at a dark red heat, and be afterwards heated to a light red heat, then the alkaline cyanate which is formed at first is reduced to alkaline cyanide, and the gain of alkaline cyanide will be considerably more.

For a continual performance of these reactions of the preparation of the alkaline cyanates in two phases, the inventors describe apparatus.

The two reactions are effected in different parts of one and the same retort, of which a certain number are put in an oven at the same time, whilst a part of each of the retorts is heated to dark red, another part is heated to light red. For this purpose vertical retorts are used, so that the substance submitted to the tests sinks down by its own weight from the more heated to the less heated part.

For the manufacture of cyanide of potassium the inventors employ a special method, viz.:—The salt formed is dissolved out, until the resulting solution shows 40° Beaumé.

This solution is then supersaturated with carbonate of soda at ordinary or at higher temperature; in the former case the potassium cyanide precipitates at once, in the latter case it does so as soon as the solution cools.

The inventors claim :—

1. The employment of upright retorts for the manufacture of the cyanides of the metals of the alkalies, arranged in a furnace in such a manner that the passage of the heating gases round them brings the upper portion of the retorts to a dark red heat, while the part below is at a bright red heat.

2. The employment in the retort of a movable tube for the introduction of a current of ammonia.

3. The precipitation of potassium cyanide from its aqueous solution by sodium carbonate.

Correspondence.

ANIMAL STUDIES AT THE EDINBURGH EXHIBITION.

SIR,—Some of those who make animal photography their speciality have been working for a long time to get their studies removed from the instantaneous class at exhibitions—where they are mixed up with yachting scenes, breaking waves, and street scenes—to their proper place, viz., under the heading *scientific;* and as the executive of the Edinburgh Exhibition have just written to say that they will do this, I hope that all who can will enter as many as possible, and make a good show, as it is the first time that we have been thus rightly classified.

May I urge this point upon hon. secretaries of other exhibitions, as unless one tells a direct untruth by entering photographs under the heading instantaneous which have had from one to two seconds' exposure, he rarely has a chance to exhibit them at all. GAMBIER BOLTON.

Camera Club, 21, Bedford Street, W.C.

MORLEY AMATEUR PHOTOGRAPHIC SOCIETY.

SIR,—I am glad to say that the amateurs of this district have succeeded in forming a society entitled "Morley and District Amateur Photographic Society," of which I forward you a members' card and syllabus of meetings, hoping you will do us the favour to publish the same in your columns.

MORLEY AND DISTRICT AMATEUR PHOTOGRAPHIC SOCIETY.

The object of this Society is for the mutual improvement of its members in the art of photography, by reading of papers, the exhibition of work and apparatus, and by rambles in search of the picturesque. Meetings are held every alternate Tuesday evening. *President*—Samuel Atkinson, Esq. ; *Vice-President*—Mr. Illingworth ; *Treasurer*—Solomon Tomlinson ; *Secretary*—Lionel Lawton, 3, Bank Top, Morley ; *Committee*—J. H. Spencer, Henry Leathley, J. W. Smith. *Syllabus*—September 2nd, Mr. Sanderson ; September 16th, Excursion ; September 30th, Mr. Richardson. G. W. LAWTON, Hon. Sec.

3, *Bank Top, Morley, August 16th*, 1890.

WHAT ARE THE BEST USES TO WHICH PHOTOGRAPHY CAN BE APPLIED?

SIR,—I can quite sympathise with your correspondent, Duncan E. Dallas, in his complaints about the unfairness of the award in the recent *Short Cuts* photographic competition, in which I also foolishly entered. In my paper (of which, unfortunately, I kept no copy), besides enumerating the uses of photography as given by your correspondent in his paper, I also pointed out its use in warfare, and especially in reconnoitreing from balloons ; for multiplying copies of pictures by the old masters and other famous artists ; for aiding artists in securing bits of street life or rustic views, to be afterwards worked up in the studio ; for the *facsimile* copying of old and valuable books and manuscripts, and for the copying of important documents in legal cases, as well as its older and well-known use in the detection of criminals.

My paper was much about the same length as that of the prize-winner, and although I had very slight hopes of being successful (in the face of the fact that I knew of several photographers who were competing), yet I must say that I was utterly astounded at the character of the winning paper, which, however good as a piece of English composition, was in no sense an exposition of the best uses to which photography might be put, but the rather showed the writer's want of knowledge on the subject.

To the other grievance—that of changing the date—there was also added at the last moment a condition that a coupon cut from the paper was to accompany each contribution. Whether this was for the purpose of disqualifying those who had sent in their papers previous to the 12th of June or not I will not pretend to say ; but, judging from the result, I should imagine that all the good papers had been disqualified.

The same periodical is now offering prizes for instantaneous photographs, but I fancy the result of the previous competition will deter many from competing until they know who is to judge them, as good men will not submit their specimens to the arbitrament of persons who evidently know very little of the art-science of photography. GEORGE BROWN.

Walworth, August 18th.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 14th.—Mr. A COWAN in the chair. A portfolio of prints was received from Dr. Emerson.

Mr. J. GOTZ exhibited McKellan's hand-camera, and directed attention to some novel points in its working, more especially to the method of changing the plates. The plates, twelve in number, are fitted into sheaths, and placed in the camera from the back, the back of the sheath holding the last plate having a strong circular spring affixed to keep the plates in position. After exposure, a lever arm at the side of the camera is brought round a distance of half a circle ; this action releases the spring that holds the front plate, and at the same time raises a receptacle into which the plate drops. Pushing the lever back to its original position carries the box containing the exposed plates to a recess at the bottom of the camera. The camera was not fitted with a finder, which Mr. Gotz thought was not really necessary, an opinion which the majority of the members did not share.

Mr. J. J. BRIGINSHAW had tried hand-cameras with and without finders. Admitting that a fairly accurate aim, with some practice, could be taken of general objects without a finder, there were many pictures—architectural, for instance—that it would be almost impossible to photograph properly without a finder.

The adjourned discussion (third evening) on printing through coloured media was resumed.

Mr. OTTO SCHOLZIG said that matt-surface prints but slightly washed would lose in toning, but not in the fixing ; prolonged washing would cause a deterioration of image. He showed two matt-surface and one albumenised prints ; half of each of these had been printed under green glass ; the remaining halves in the ordinary way without any medium, all to the same depth as near as it was possible to judge. The prints were then divided lengthways, and half of each toned. After a close comparison, the general opinion was in favour of those printed through green glass, as showing the greater amount of detail.

Mr. J. S. TEAPE had received three half-sheets of sensitised paper from Mr. Scholzig. He showed prints from this paper printed in white light and through green glass from the same negative ; the latter were considered to show better detail.

In a similar set of prints, printed under the same conditions, on paper freshly sensitised without any preservative, the difference was not so marked. Two matt-surfaced prints were also shown, one printed in bright light under green glass, and one in the shade in white light, both toned in the same bath, and for the same length of time. The result was in favour of the green glass medium.

Mr. W. E. DEBENHAM held that experiments of this kind could not be considered identical when freshly sensitised and preserved papers were used ; in each case a different result being obtained. The colour of the glass used had also to be taken into consideration. He showed three pieces of green glass of varying depths of colour, which he had used in the course of his experiments. Using paper freshly sensitised in a sixty-

grain bath, four prints were made from a thin negative, two having an exposure of three and a half minutes; one printed for the same length of time in bright light, but at intervals to allow the chlorine to escape, and one printed in the shade, taking two days; three others were printed under light and dark green glass and white light respectively under a dense negative. Mr. Debenham was of opinion that with dense negatives printing under green glass brought out more detail, and that the prints were more amenable to toning effect.

Mr. ATKINS showed two prints, one of which had been printed under green glass, but little difference was noticeable. It was pointed out that the sheet of glass under which the print had been exposed, which was handed round with the prints, had a tendency to a blue colour.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A MEETING was held on the 13th inst., Mr. W. BENHAM in the chair.

There were seven applications for assistance, of which six were granted. The amount of grants voted was £15 4s. 6d.

THE SOUTH LONDON (*late* EAST DULWICH AND PECKHAM) PHOTOGRAPHIC SOCIETY.

THE usual meeting was held on Friday, August 15th, at 76, Peckham Rye, the PRESIDENT in the chair. One member was elected.

After the transaction of the ordinary business, the meeting was made "special" to take into consideration a proposed change in the title of the Society. On the motion of the President, it was unanimously resolved that the Society in future be called "The South London Photographic Society." On and after the meeting on October 3rd, the Society will meet at Hanover Hall, Hanover Park, Rye Lane, S.E., the number of members the Society has enrolled since its foundation necessitating increased accommodation. The new meeting place is within three minutes' walk of tram or train (Peckham Rye, L.C D.R., and L.B.S.C. Railway Company).

The following is the syllabus for the winter session, 1890-91 :—

September 5th—"Mounting and Finishing," Mr. C. Hoddle; September 19th—Exhibition of F. W. Hart's patented apparatus for Flash-light, with demonstration; also Stands for Optical Lantern Screens, Photo Backgrounds, Studios, &c., Mr. F. W. Hart; October 3rd—Lantern Night, Mr. Boydell and other members; October 17th—Demonstration with Alpha Paper, the President; November 7th—Lantern Night (A Tour to the Channel Islands), H. Banks; November 21st—The Annual Exhibition; December 5th—Photographic "Dodges," discussion to be opened by the President; December 19th—Experiments with Optical Lantern, H. Banks and S. W. Gardner. During the month of January, 1891, Mr. Leon Warnerke has consented to give a demonstration on "Mechanical Printing as applied to Photography."

The following medals are offered for competition at the Exhibition for work done by the members: One silver medal for the best general work, and one for the best six pictures taken at the Society's excursions: one bronze medal for the second best six pictures taken at the Society's excursions; one for the best of six local views; and one for the best series of lantern slides consisting of not less than six nor more than twelve.

HACKNEY PHOTOGRAPHIC SOCIETY.

MR. ROBERT BECKETT gave a paper on "Intensifying, Reduction, and Varnishing," on Thursday last, Dr. ROLAND SMITH presiding. His formula for intensifying was :—

Mercuric chloride	...	...	...	¼ ounce
Hot water	...	...	...	1 pint
Hydrochloric acid	...	...	...	60 minims

The great thing was to give plenty of washing to the negative. For blackening, he used a 15 per cent. solution of ammonia, but if denser negatives were required, he advised sulphite of soda. He had been very successful in intensifying under-exposed plates. For reduction he used Mr. Farmer's formula, a 6 per cent. solution of red prussiate potash and hypo. For local reduction, Mr. Beckett advised methylated spirit. He then reduced a negative, preferring to demonstrate, which he did very successfully.

The SECRETARY showed paper made by Messrs. Geering & Co., of Stamford Hill. He had tried their pyro developer successfully.

Mr. POULSON showed the Quadrant hand-camera, which is simple and compact.

At the monthly excursion to Carshalton, under the guidance of Mr. W. L. Barker, there was a good muster, and successful exposures were made.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

August 11th.—Mr. PAUL in the chair. Messrs. Norris, Gosling, and Cox were elected members.

Mr. WALKER said that he had found that nearly all the automatic arrangements for changing plates in hand-cameras were defective, causing the plates to get fixed at awkward times. The methods of changing plates with various cameras were discussed, as also changing bags for use with dark slides.

The advantages of a turntable fixed to a camera were considered.

On Monday, September 8th, the Secretary will read a paper on "Collotype," contributed by a producer in the trade. Visitors are invited to attend.

The following is the syllabus of ensuing meetings :—September 22nd—"Lantern Slide Making," a demonstration by Mr. C. Beadle; October 13th—"Pictures of Egyptian Life," an evening with the lantern, by Mr. D. P. Rodgers; October 27th—Lecture on "Stereoscopic Photography," by Mr. Bishop; November 10th—An evening with the optical lantern; November 24th—Mr. Friese Greene will occupy the evening with a description of his latest experiments; December 8th—Conversazione and exhibition of members' work; December 22nd—Meeting for the nomination of officers for ensuing year; January 12th—Annual general meeting. Members of kindred clubs and visitors are invited to attend any of the above meetings.

DUNEDIN PHOTOGRAPHIC SOCIETY, NEW ZEALAND.

THE first annual exhibition of this Society was opened on June 28th, and continued for a week, during which time it was visited by a large number of the public. The Society is composed of amateurs only, and though it is young the show of work by members was considerable, and called forth praise. On the walls were many specimens of enlargements, embracing portraits, landscapes, yachts, and animal life. Although prints on albumenised paper largely predominated, there were not wanting examples on other papers—platinotype, aristotype, and bromide. Perhaps one reason for the small number of platinotypes and aristotypes is to be found in the bad keeping qualities of the materials, both papers deteriorating to a great extent before they reach the Colony. Silver prints were represented by an extensive collection in all sizes from 10 by 8 to quarter-plate, illustrative of New Zealand scenery—yachts, portraits, and groups. Artistic taste seems to have been exercised by some members in their pictures, noticeably in the beautiful cloud effects, reflections, and atmospheres. It is intended to hold an exhibition annually.

This Society enjoys the reputation of being the most southerly photographic society in the world, and as its location is amid some of the most beautiful scenery south of the line, the work of the members may be expected to be, in views at least, interesting and pretty.

NORTHERN TASMANIAN CAMERA CLUB.

At the first annual meeting of the Northern Tasmanian Camera Club there was a good muster of members; Dr. H. A. ROOME occupied the chair. Mr. Walter Brickhill was unanimously elected a member.

The SECRETARY then read his report, in which he stated that during the year the list of members had increased from ten during the first month to twenty-eight at the present time.

The meetings had been fairly attended considering so many members reside in the country, and that next year the committee would endeavour to make the meetings even more attractive. One field day was held, in November, and it is hoped that more of these pleasant and useful excursions will take place. Two prize competitions have take place, one in landscapes and one in out-door portraiture. The winners of the first certificate were, in landscape, Dr. Roome; in portraiture, Mr. F. Styant Browne; second in landscape, Mr. F. Styant Browne; in portraiture, Dr. Roome; third in landscape and portraiture, Mr. R. L. Parker. Mr. S. Spurling acted as judge in landscapes, and Mr. Carl Burrowes in portraits. The circulation of collections of photographs, the work of members, had proved satisfactory; a good number contributed; the criticisms were given in a fair and good-natured way, and some changes are about to be made which will make these circulations even more popular.

Papers were read, and practical work in enlarging and developing considered, and lantern slides exhibited, all tending to make the meetings interesting and instructive. One death had occurred among the members, that of the late Captain Arthur, R.N., whose loss was deeply regretted. The income and expenditure were submitted in the treasurer's statement, and it was satisfactory to find that a substantial balance was left to carry forward to the new year. The library was well patronised, and thanks were given to the president (Mr. Wm. Aikenhead), Messrs. R. L. Parker, and S. Spurling for donations of books.

At the conclusion of the secretary's and treasurer's report office-bearers were elected for the ensuing year, with the following result:—*President*—Dr. H. A. Roome; *Vice-President*—Mr. R. Lewis Parker; *Secretary, Treasurer,* and *Librarian*—Mr. F. Styant Browne; *Committee*—Rev. A. H. Champion, Mr. R. Kermode, and Mr. A. C. Bonner.

Dr. ROOME then read a paper entitled "Practical Hints on Photography," and after a discussion upon some of the points in the paper, a vote of thanks was carried.

The Camera Club have reason to be pleased with the result of their first year's work, and it is hoped and expected that at the close of the second year the secretary and treasurer will be able to give a still better account of the prosperity of the Club.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The monthly technical meeting will be held on Tuesday, August 26, at 8 p.m., at the Gallery, 5A, Pall Mall East.

PHOTOGRAPHS ON GRAVESTONES.—Mr. Charles John Tozer, of 27, High Street, Plymouth, has brought out a device to be attached to gravestones, vaults, and such like, for displaying photographs, and for holding visiting, mourning, or memorial cards, flowers, and similar articles. It is intended by this ingenious inventor to attach the photographs of the deceased, or suitable mottoes, to a disc revolving by means of a button projecting from the face of the apparatus at the back of the device, which is locked at the back to a rebated ring fastened to, or suspended from, the head-stone, vault, or other place. The face of the device is provided with a glazed aperture, behind which the photographs appear successively as the disc is revolved. The disc can be covered at will by means of a flap or door, the inside of which may be fitted with a small mirror. A small lock-up box with glazed front is also attached to the face of the disc, the said box being provided with a longitudinal slit for the reception of visiting, memorial, or mourning cards, and with shade or canopy or hinged sloping roof over the said slit to prevent the rain and snow from entering the box through the slit. Double vases also are secured to brackets on the face of the device, the inner vase being watertight for the purpose of holding cut flowers, the outer vase being perforated to enable trailing plants to grow over the sides, thereby decorating the otherwise plain appearance of the stone. A hook is fixed just above the top of the ring for the purpose of hanging a wreath upon. Thus it will be possible in future to have the likeness of the deceased ever present to the mourners, and to provide a record of the visits to the grave.—*Invention.*

Answers to Correspondents.

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

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

MUCKROSS.—*Stains of Fading in Prints.* From the purely local character of the stains, and shape of the marks, we should unhesitatingly say they were due to splashes of hypo, which must have dropped upon the prints when the washing was nearly if not quite completed. This explanation is more probable than to suppose that they arise from original defects in the paper.

S. M.—*Time Indicators for Developing.* The common egg boiler is sometimes employed in studio practice, and if this does not give the exact period required, it is easy to guess the variation within or beyond this definite limit; at any rate, it is much more convenient than working by a clock dial or stop watch, the sand column being clearly visible by transmitted light if set on the window ledge.

SUTTON.—Received your letter. Leave the matter in our hands for a few days, to give an opportunity of making the necessary inquiries.

T. S. B.—Failing the course already taken, your want ought to be immediately met by inserting an advertisement.

L. E.—*Non-Corrodible Spatula.* A silver coin flattened out and elongated by passing several times through rollers makes a capital spatula, and for photographic use is almost as good as platinum. Any assayer will do it for you in a few minutes in the event of your own rolling-press proving unequal to the task.

M. G.—*Stripping Films.* After fixing and washing, immerse in dilute acid (three drops of strong hydrochloric to the ounce of water), then cut off the extreme edges of the paper, and heat up to 120°-140° Fahrenheit in a dish of hot water. Done in this way the stripping ought not to present any difficulty, although old exposures may demand the exercise of a little patience.

R. T.—*British Association Meeting.* At Leeds, on Wednesday evening, 3rd September, Sir Frederick Abel, president, will deliver his inaugural address, and the sectional meetings will occupy about a week. Mr. J. W. L. Glaisher is to preside over Section A (Physics), and Professor T. E. Thorpe has charge of Section B (Chemical Science).

LUTON.—*Interchangeable Albums.* If we rightly understand your description, Messrs. Marion and Co. will show you the identical thing already in stock. It is no novelty.

C. B. H.—*White Shellac.* This is always held to be a chlorine compound, and not bleached by sunlight exposure, as you seem to imagine. Deflagrate a little white lac in pure melted nitre, and you will be able to detect chlorine in the aqueous solution of the fused mass.

STUDIO.—*Fire Insurance Policy.* By paying for the odd time, in addition to the annual premium, you need not wait until Michaelmas day. The office takes the risk immediately on acceptance of your proposal, and may even do so before inspection.

NEMO.—*The Cantor Lectures.* Inside the wrapper of the *Society of Arts Journal* you will find a priced list of all the reports which are now procurable, and that which you are inquiring about is one of them.

C. N.—*Silver Varnish.* If you refer again you will find that last week we mentioned amylic acetate, and not amylic alcohol (fusel oil), which is a very different thing. The former is made from the latter by distilling it with oil of vitriol and fused acetate of soda.

DR. GUNTHER.—For the information of S. P. and another correspondent, will you be so good as to say what is to be understood by "thick gelatine" for etching solution, about the middle of your first column, on page 608? Further down, if the exposed plate be submitted only to a "short damping process," how is the excess of bichromate to be removed?

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1669.—*August* 29, 1890.

CONTENTS.

THE CAMERA CLUB AND COMMERCIAL PHOTOGRAPHY.

OF late years, the chief standards in photography have been rising; platinum prints have been gaining ground as compared with the position of their fading silver brethren; the artistic effects obtainable by photo-etching are daily more and more in demand; higher artistic excellence in landscape and portrait work has become a necessity for those professional and amateur photographers who wish to make a name in the world; lastly, as regards public organisations, high intellectual activity and culture, combined with freedom from bias by commercial considerations, form one among the requirements of the times.

In relation to the last-mentioned item, in the course of the past two weeks attention has been called in these pages to the Camera Club letting a portion of its new premises to a dealer for the sale of photographic goods, and as the Camera Club virtually, if not in set terms, professes to stand before the world as a body able to speak its mind freely without bias from commercial considerations, a public discussion about the relations of the Club to this shop became, sooner or later, inevitable.

A letter in our correspondence columns to-day settles the whole matter as regards the sale of goods on the premises, completely and satisfactorily. The shop is not let on a seven years' lease to a young dealer just starting in business, as might have been the case for aught we knew last Friday to the contrary, but to Mr. Adams, of the firm formely known as Abrahams and Co., who will use it but as a branch establishment, who has a seven years lease of the shop, and can get another seven years' lease at his own option and not that of the Club, and who is strong enough and experienced enough to take care of himself, or to "snap his fingers at the Club" if he likes, but which would be an extremely ill-bred line of action.

Thus the action of the Club stands clearly revealed; it has merely let the shop to a photographic dealer for the sake of the convenience of being able to buy photographic goods on its own premises, and in this matter cannot and does not desire to exert any undue influence whatever over the said dealer.

Mr. Adams tells us that, although his shop will have no door in the front of the Club premises in Charing Cross Road, it will have two windows there, so there is no hiding away of the shop at the back of the premises, as might have been the case for aught that we could gather to the contrary from the information afforded up to last Friday. Thus, prevalent rumours about the relationship of the Club to this commercial matter may now be decently buried for fourteen years.

THE VIENNA INTERNATIONAL PHOTOGRAPHIC SALON.

WE have just had the pleasure of receiving definite particulars about the forthcoming International Photographic Exhibition at Vienna from Mr. Carl Srna, the president, and Dr. Frederico Mallmann and Mr. Carl Ulrich, the vice-presidents of the Exhibition Committee of the Club of Amateur Photographers at Vienna. Special interest attaches to this Salon, because its managers will make the first influential attempt in connection with photographic exhibitions to reject all inferior work, irrespective of the amount of wall space they may have at command. A competent jury will decide whether each photograph proffered has sufficient merit to deserve exhibition at all. The promoters of this Exhibition care nothing for quantity, but regard only quality; they care not how small in number the pictures exhibited under their auspices may be. The coming Vienna Exhibition will be open from April 30th to May 31st, 1891.

The Exhibition will be held in the Imperial and Royal Austrian Museum of Arts and Manufactures, and the question of the admission of pictures will be subjected to the decision of a competent jury of artists and photographers. Each admission is an honour which

will be certified by special diploma bearing the signature of the "Patroness of the Exhibition, Her Imperial and Royal Highness the Archduchess Maria Theresa."

The jury will have the privilege of recommending competitors for special good work for the silver-gilt Maria Theresa medal, which, says our informants, "will be awarded by Her Imperial and Royal Highness." The number of these medals is not to exceed ten, and must be awarded unanimously.

The approval of two-thirds of the jury is required for the admission of a picture. No scientific section will be opened this time.

All photographs of artistic merit will be admitted, including landscapes, studies of flowers and of animals, genre pictures, portraits, and so on, besides diapositives, lantern slides, and stereoscopes. Every picture not smaller than 12 centimetres by 9 centimetres must be mounted on a separate sheet of cardboard, with or without a frame. Suitable frames will be supplied by the Club free of charge. The subject and artist's name must be on each picture.

Pictures previously exhibited in Vienna, in 1888, cannot again be exhibited.

Applications for admission of pictures must be made not later than the 15th of January, 1891, and exhibitors will kindly forward their photographs before the 1st of April, 1891, to a London address, which will be made known in time, whence they will be forwarded and returned at the expense of the Club, and no farther charges, as for wall space, and so on, will be incurred by exhibitors. The names of the members of the jury will be published before the 1st of January, 1891. No exhibits will be allowed to be removed before the close of the Exhibition. The jury will decide where the pictures are to be fixed.

The committee reserves the right of issuing farther rules, if necessary. All communications to be addressed to the President of the Club, Mr. Carl Srna, VII. Stiftgasse 1, Vienna.

The officers of the Exhibition Committee of the Club of Amateur Photographers in Vienna, other than those we have already mentioned, are the *Secretaries*—Anton Einsle, Dr. Julius Hoffmann, and Carl Winkelbauer; *Cashier*—Friedrich Vellusig; *Librarian*—Robert Ritter von Stockert; *Members*—Gustav von Dürfeld, Fritz Goldschmidt, Carl Hiller, Baron Alfred Liebieg, August Ritter von Loehr, Baron Nathaniel Rothschild, Dr. Eduard Suchanek.

The professional photographers of Holland have just formed an association, the Nederlandisch Photographen-Verein, at Amsterdam. They expect shortly to issue an organ of their own.

Sub-Fluoride of Silver.—A subject of interest to photographers was treated of before the Academy of Sciences at Paris, on 23rd June, by M. Guntz, who read a paper on the sub-fluoride of silver. The existence of this salt was indicated by the analysis of a precipitate produced on the negative pole, on the subjection of a hot saturated solution of silver fluoride to electrolysis, with the aid of a very strong current and silver electrodes. By heating finely-divided silver, with a saturated solution of silver fluoride on a bath, to a temperature of from 50° to 90° C., the pure salt may be obtained plentifully, which, on analysis, proves to be the sub-fluoride of silver, Ag_2F.

THE LIGHT OF THE FUTURE.

It would not be altogether an unprofitable task to search the newspaper files of past years in order to see how many of the inventions, loudly exalted by them, have survived their early infancy. We allude to those inventions which, like that of the phonograph, the penny-in-the-slot photographic camera, and others, are calculated to tickle the public taste, and for that reason have called forth all the flowery language that a daily leader writer has at his command. We venture to think that not a few of these children which, in their early years, showed such promise, have since died off from sheer want of strength of constitution.

Supposing that we made such a search as that indicated, we should find about every tenth year a crop of patents having reference to electric illumination, and in company with them we should have the inevitable leading article consisting, half of a condensed *Encyclopædia Britannica* account of the history of the thing, and the other half of a prophecy that Jones's new device would now bring electric lighting within the reach of the poor man. About every ten years has the subject cropped up since, at the beginning of the century, *Mr.* Humphry Davy showed that the terminal wires from a powerful battery would, if fitted with carbon points, emit a most brilliant light. Scientists have told us that spots on the sun have their periods, and that they very probably exercise some effect upon the abundance of our harvests and vintages. It would almost seem as if the sun-spot theory ought also to be applied to the periodic appearance of electric illumination patents; and there would be the more reasonableness in this, seeing that father Sol must be personally interested in the doings of a powerful rival in his own particular line of business.

But now, after many decades, during which the instant coming of general electric lighting has been as often prophesied as the end of the world has been forewarned by another class of enthusiasts, we are within measurable distance of seeing the prophesy fulfilled. Inventors have been busy, old patents have been re-patented and furbished up anew; novelties have been introduced; our American cousins, more go-a-head than we, have taught us what to adopt and what to avoid; the legislature has withdrawn many restrictions which it had imposed in the righteous endeavour to prevent such another monopoly as the gas and water companies represent, and at length the ground is cleared. The era of electric illumination has commenced, and it behoves us to consider how far the new departure will affect the work of those who—of all bread-earners—depend most upon light for their subsistence.

In endeavouring to glance into the future, it is always best to look back upon what has already been done in the same direction. Many of our leading photographers have long had the electric light in use, both in their studios and in other parts of their premises. They have been wise in taking first advantage of a method which is most effectual for portraiture,

and which offers many other minor advantages in its use. These pioneers have not been able to instal the electric light without considerable outlay of capital, and they certainly deserve all the kudos and more substantial return which the change has brought to them. A dynamo machine, and a gas or steam engine to work it, together with the rest of the apparatus necessary to produce the light, represent rather a costly enterprise, but one which—in London, at least, where there are so many days when the sun is hidden in clouds of smoke—would soon repay the speculator; and hence we find that several of the West-end houses have for some time been independent of daylight, and have actually been working in studios from which daylight is carefully shut out.

In the various London houses which are devoted to photo-mechanical block work the electric light is also installed, not only for copying the line drawings from which most of these blocks are prepared, but also for exposing the sensitised zinc plate beneath the negative. It would never do for such works to be dependent upon fickle daylight, and even if natural light did not deserve the charge of inconstancy, it would be the same, for the work has generally to be carried on during the dark hours. This is, of course, imperative for newspaper work, which is done, as everybody knows, when the rest of the world is asleep.

The electric light has also been long recognized as the best that can be utilised for the work of enlarging. The Eastman Company, at various exhibitions, have shown wonderful life-sized portraits which have been taken from half-plate originals, and we may say that this work would have been next to impossible in the absence of a light which is at once small in area and intensely brilliant in quality. The allied business of projection, optical lantern fashion, by means of electricity, is yet quite in its infancy; but we may mention, in passing, that a lantern lighted by this means has for some time been in use at the large theatre of the Society of Arts, in the Adelphi, and that at other places the electric arc light has been tried for this purpose with most promising results. For microscopic projection work the light is unequalled, as it is also for spectroscopic experiments. In these various ways it is coming into use in our leading schools and colleges.

But it is not until the electricity is "laid on" to us like gas and water is at present, that the photographer of humble aims can make use of it. It is then that he will have his perfect dark-room, which can be illuminated by incandescent lamps in red globes by the touch of a button. Then he can laugh at the occurrence of dull weather, for the arc lamps in his studio will place constant brightness at his disposal. He may possibly, for a time, be still dependent upon daylight for printing purposes, but we venture to predict that, before the new light comes into general use, a quick printing process by development will have cast out the older methods.

It it stated that the Photographic Society will take new premises for its meetings, and use its present ones for exhibitions only.

TOURIST PHOTOGRAPHERS AND THE CHANNEL PASSAGES.

III.

The great historical route to France by Dover and Calais now demands attention.

Dover is a highly picturesque place, and, as its heights are monopolised by fortifications, and its lower portions near the sea have been largely under requisition for railways and docks, the town is of straggling form, so that but small portions of it can be seen at any one time or from any one spot. Some of the oldest parts of the town have been pulled down in times past to give extra railway accommodation. The streets are so laid out that not a few of them at the southern end of the town, and some others all the way thence to Dover Priory, lie in such a direction that the view at the end of each street aforesaid is closed by the Castle Hill and old Dover Castle on the top thereof. Good instantaneous views of busy streets in Dover, with this picturesque termination, would make striking lantern slides. One of the best views of the Castle is to be obtained from the Admiralty pier. The photographs of the town in the shop windows of Dover are of mixed quality, and are commonly defective from having been taken with lenses of too wide an angle.

The English mails are carried on land by the South Eastern Railway Company, and across the Channel by the boats of the London, Chatham, and Dover Railway Company, in accordance with an understanding between the two companies. The French Government will not allow its mails to be carried under the English flag, hence some of the mail boats crossing between Dover and Calais are under the command of French captains, and manned by French crews, a fact of which the passengers travelling by them are not always aware. Some of the reputed French sailors on these boats cannot speak French, but were born in Dover, and can speak no language but English. These French boats, again, belong to the Chatham and Dover Railway Company, which lends them to the French Government for an annual payment rumoured to amount to £9,000 a year.

The largest passenger boat running between Dover and Calais is the *Calais-Douvres*, built in 1888; two other large ones are the *Empress*, built in 1887, and the *Victoria* built in 1886. Another large boat is the *Invicta*. Among the smaller passenger boats on this line are the *Petrel*, *Foam*, *Prince*, *France*, and *Wave*. The three large boats first mentioned are all built of Siemens' steel, and have compound engines; they run to Calais in about from fifteen to twenty minutes less time than the smaller boats, and at the cost of the great consumption of coal which is always necessary to get high speeds on the water; in fact, a gang of men is ceaselessly stoking all the way across.

The twin-ship, the well-known *Calais-Douvres* of times past, exists no longer; the new *Calais-Douvres* now running is not of such an experimental type, but is a steamship of a more normal description. As already stated, she is the largest boat on this service;

her length is 325 feet, breadth 70 feet, 1,000 tons burden, and steams, we are told, at from 19½ to 20 knots per hour, that is to say, about 23 miles per hour. Her upper deck is a shelter deck, which makes a fine promenade; there is also a broad promenade round the sheltered main deck. Deck cabins are numerous, and serve the purposes of the proprietors admirably, since the letting of them is all profit. The saloons for ladies and other passengers are of a splendid and comfortable description, with nothing tawdry in the fittings or ornamentation. Captain Frederick Dane, who commands the *Calais-Douvres*, is exceedingly proud of his fine ship. He says that amateur photographers abound among the passengers, especially among those coming from America, and occasionally, when on the bridge of the boat, he hears the remark coming from below, "Now we'll take a shot at the captain." He then promenades the bridge to render the self-appointed task less easy, but in so doing probably under-estimates the powers given by instantaneous shutters.

The *Empress* is 315 feet long, 67 feet broad, and 875 tons burden. The *Victoria* is 309 feet long, 64 feet broad, and of 800 tons burden. They are of the same type as the *Calais-Douvres* just described. They are all built for steaming into shallow harbours, like that of Calais. The *Calais-Douvres* draws 9 feet of water, the *Empress* 8½ feet, and the *Victoria* 8 feet 3 inches. On two or three days in each month, at low spring tides, these boats cannot pass over the sand-bar off the entrance to Calais Harbour, and the smaller passenger boats have to be run in their places. All the steamships in the Dover-Calais passenger service are paddle-boats.

At Dover, the incoming boats are usually met by three trains upon the Admiralty pier. One of these is the South Eastern train, to carry mails and passengers to Cannon Street; another is a Chatham and Dover train for Victoria; a third is a train of the same company for Holborn Viaduct. Most of the boat trains do not stop anywhere between Dover and London. Passengers, whether more or less sea-sick, can get tea and coffee directly they get on firm land, that is to say, on the Admiralty pier, Messrs. Spiers and Pond having fitted up a coffee stall on the pier in a bleak situation, chilly even in the summer; they might as well provide some kind of shelter, as in the offices on the pier of some of the officials alongside. Messrs. Spiers and Pond's coffee stall does not run upon wheels in orthodox fashion, but consists of a few planks; fried fish is not dispensed at this establishment. At Dover town Station the same firm has an excellent restaurant, and the moderate prices are in violent contrast to the excessive charges on the French side.

In certain states of the weather there are more facilities for obtaining good marine views from the decks of the Dover and Calais boats than can be obtained upon any other route. The Channel is at its narrowest there, and, moreover, is not much frequented on the shallower French side by shipping; hence, after vessels have been detained up Channel for some days by strong westerly winds, the sea off Dover becomes crowded with vessels. Last Sunday morning we counted more than a hundred ships in sight at one time from the deck of the Calais boat, and some of these sometimes passed under full sail close at hand; one of them had a windmill on deck, with the vanes rotating; the sunshine was bright and the clouds magnificent. In the broader parts of the Channel such photographic opportunities are less numerous.

As Calais is approached, the dark indigo colour of the sea begins to be broken by various areas of green and yellow water, and a line of surf is sometimes seen; the latter marks the position of one of the outer sand-beds, but not the one farther in, which sometimes prevents the passage of the larger boats. The differences in the colours of the sea are due to the character and amount of suspended particles in the water; the darker the sea, the more indigo-like or black it appears, the purer is the water; it is more free from suspended particles. Under these circumstances, such of the incident light as is not reflected at the surface, passes into the depths of the sea, and not being reflected abundantly to the eye of the spectator, the water looks dark. With a moderate proportion of suspended particles in the water the sea looks green, and with more particles still it looks yellow Professor Tyndall once illustrated the principle in his exquisitely clear way by attaching a dinner-plate to the end of a rope, then dropping the plate over the side of the ship into a dark indigo-looking sea. The plate looked bright green in the dark water, because it reflected to the eye green rays which otherwise would have penetrated to great depths. "Suppose this plate to be crushed into powder," he said in effect, "or into an infinite number of microscopically small white plates, each suspended white particle would still reflect green light to the eye; hence the green appearance sometimes presented by the sea."

With Calais we shall deal in the next article in this series.

PHOTOGRAPHY AT THE EXHIBITION OF THE MEDICAL CONGRESS.*

MEDICINE is one of the sciences which earliest adopted photography as an aid, and in few other sciences has our art achieved such triumphs as in this one. Whoever has examined the objects in certain departments of the recently closed Medical Exhibition in Berlin, cannot have escaped being impressed with the importance of photographic results in connection therewith.

The service rendered by photography to medicine is not confined to its application as a means of research; hygiene, diagnosis, statistics, pathology, and forensic medicine, are all indebted to it for the evidence which it brings to bear.

As it is difficult to classify the photographic contributions on view at this Exhibition, the description of them must partake, more or less, of a desultory character. Of cameras, and such mechanical aids to photography, there was a good and interesting display furnished by Stegeman, Schröder, Hezekiel, and others. Stegeman exhibited

* Translated for the PHOTOGRAPHIC NEWS from the *Photographisches Wochenblatt*.

amongst others, a very well-made bellows-camera, with a long base-board, to be used in combination with a microscopic objective, for the purpose of producing micro-photographs. Hezekiel showed a Loman camera and others specially adapted for medical purposes, particularly hand-cameras and flash apparatus, in the newest and most improved form. Dr. Hartnach and Görz had a large collection of photographic objectives. The latter showed optical glass, as used for photography, in large pieces and in the rough state, as well as an entire series of his new objectives. Dr. Hartnach exhibited here, for the first time, a selection of photographs exhibiting the capabilities of the lenses shown. As a step in advance, it is to be noted that the principle of the Iris diaphragm has been strictly carried out.

A very extended application of photography is found in the representation of typical forms of disease. Dr. Bein has cultivated this branch of photography at the University of Berlin with remarkable success. We find pictures of consumptives in all stages of the disease, and a similar collection of photographs illustrating asthma and various other maladies. In another place we meet with photographs enlarged from small originals to life-size of an old man in whom the action of particular muscles of the face has been called into play by electrical applications. The typical expression of pain, aversion, laughter, pleasure, astonishment, and fear, are clearly brought out. A very impressive series is that of photographs of the dying, mostly phthisis cases, in which the anguish of death is fearfully brought home to the spectator.

Particularly instructive for the surgeon must be the series of photographs in which the various phases of an operation are shown up to its successful completion. We thus follow the course of the amputation of a foot, and the manner in which the wound is closed; the curvature of a spine, and its improvement under orthopœdic treatment: the means employed with crooked legs; and many others of a like character.

Of a very large range are the performances of micro-photography. To the union of photography with the microscope medicine is indebted for some of its most successful progress. Drawings of microscopic objects, which are necessarily very imperfect and subjective in character, are now supplanted by photography. The study particularly of the bacteria organisms, which, though small, are of such destructive character to humanity, is enormously advanced by photography. Even where the eye of the seeker fails to reach, photography steps in and brings forth evidence of minute structure; the circumstance that we have the help of light, the wave-lengths of which are invisible, though still active upon the sensitive plate, coming to our aid. Pictures illustrating this department have been shown by Dr. Neuhaus. The sharpness and technical completeness of these photographs is wonderful.

Amongst the apparatus for micro-photography, the great camera of Dr. Zeiss, and the smaller one of Dr. Hartnach, should be particularly mentioned. The object aimed at in both cases is a fine and immovable focus, but it is brought about in very different ways. Very good apparatus of this kind is also shown by Klönne and Müller, and by Leitz. How far the task of resolving the finest structure has been achieved by modern apparatus may be illustrated by the fact that there is now no difficulty in resolving an object (*amphipleura pellucida*) which shows lines of 4,000 to 5,000 to the millimetre.

The experiments made in various quarters for bringing flash-light into the service of micro-photography are very noteworthy. Both in the original form of explosive powders, as prepared by Gaedicke and Miethe, and in that of blow-through light, as used by C. C. Schirm, the method finds application. Remarkably perfect results obtained in this way are shown by Dr. F. Röhmann, who has employed certain metallic salts for the purpose of colouring the flame.

(To be concluded.)

THE IMPERIAL AND ROYAL INSTITUTE FOR INSTRUCTION IN PHOTOGRAPHY AT VIENNA.

Assembly of the Students.

On the 12th, 13th, and 14th of September will take place the reception of students for the winter session of 1890-91 at the Royal and Imperial Institute for Instruction and Research in Photography and Reproduction Processes in Vienna; the course of instruction begins on September 15th. The duties of instruction are undertaken, and the processes gone through with the pupils, by the various practical professors in the studios, laboratories, and printing rooms of the Institution. Portrait and copying by the camera, wet and dry negative processes, orthochromatic photography, the preparation of emulsions, retouching of negatives and positives, printing processes, processes of printing direct from tracings, transparencies, enlarging, and micro-photography, are all gone through. Moreover, the photo-mechanical reproduction processes, collotype, photo-lithography, zinc etching, photo-zincotype, and other special photographic methods are demonstrated according to the measure of the requirements, and of the means at hand for executing the work.

The studios and printing rooms are open daily from eight in the morning till half-past three in the afternoon. The drawing studios—for freehand drawing, instruction in perspective, and mechanical drawing—are open daily from five till eight in the evening. There is instruction in the day-time for special artistic ends, such as making drawings for the purpose of having reproductions made therefrom, for more advanced pupils in drawing from the solid, in lighting, and in the study of colours.

The instruction includes photo-chemistry, photography, details of printing processes, retouching, chemistry, and physics, chemical manipulations (with practice in the laboratory), professional calculations, geometrical drawing, and the consideration of the question of protection of artistic and literary property.

For the use of the members of the classes, the Institute possesses a rich collection of apparatus and library of works pertaining to the art.

Professional photographers, artists, and teachers, who only require instruction in some particular photographic processes, are received as extra students.

Further particulars may be obtained at the office of the Institute, Dr. J. M. Eder, Chief Director, Westbahnstrasse No. 25, Vienna.

Messrs. Newton and Co. have just published a series of new lantern slides, consisting of pictures from Stanley's new book, "In Darkest Africa." Many of the pictures were copied from the original drawings on the wood-blocks before the latter were cut by the engraver; others were copied from the engravings as they appear in the book. Some negatives were taken in the course of the expedition itself, but rumour says that they were not of a first-rate description.

LIMITATIONS IN THE TREATMENT OF SUBJECTS BY FOCUS.

BY T. R. DALLMEYER.

Some Points of Comparison between Vision and Lens Images in Photography.

In this paper I propose not only to reply to the points raised by Mr. Burton on this subject, but also to some others that were recently brought forward by Mr. Dennis Taylor in the *Photographic Quarterly*. If I have misunderstood Mr. Burton, I have at any rate only spoken about what he has written, and endeavoured to put a fair interpretation upon it. Mr. Burton now confines himself to one aspect only of focus, viz., that one plane should be as sharp as any lens is physically capable of giving it, supporting this by the statement that it had been shown by Lord Rayleigh that the eye will define quite as perfectly as the best of lenses.* When comparison is made between what the eye can do and the definition to be assigned to a lens to become parallel with it, there are various considerations to be taken into account that must be weighed for a faithful representation of ordinary physical eyesight. As an optical instrument, Helmholz certainly has spoken of the eye in facetious terms, but I do not presume that Helmholz or any authority would detract from the beauty and value of the eye as it exists.

The late Sir John Herschel, speaking of the eye, has said:—"However anatomists may differ on points of structure, or physiologists dispute on modes of action, there is in what we do understand of the formation of the eye, so small and yet so infinitely superior to a production of human ingenuity, such thought, such care, such refinement, such advantage taken of the properties of natural agents used as mere instruments for accomplishing a given end, as forces upon us the conviction of a deliberate choice and premeditated design more strongly, perhaps, than any single contrivance to be found, whether in art or nature, and renders its study an object of the deepest interest." The scientific investigations on the construction of the human eye only help us to appreciate this most wonderful piece of mechanism, and if possible, from any of its defects as an optical instrument, value still more the enjoyment we derive from its marvellous powers as they exist. If, when we opened our eyes, we received a "sticking-plaister" brain-impression like the monotonous uniformity of impression given by a well stopped down lens on a sensitive plate—supposing such a state of things were suddenly to arrive to us—we should probably yearn again for the more defective construction that had doled out the beauties or incidents of the scene before it—the wherewithal for us to feast on, when and where we found enjoyment, by the combined use of our opticial and mental foci.

Mr. Burton's contention seems unsound, for the following reasons. First, in viewing any landscape or subject, the retina of the eye is more or less flooded with a diffused light; in the case of a camera with a well stopped-down lens there is comparatively no diffused light to interfere with the powerful discriminating focus that registers the image. Then, in viewing any subject, we have *binocular vision*. Binocular vision is, in one sense, of use only up to a certain distance, but is a very powerful means of discrimination for near planes. I believe I have normal vision, and I can distinctly see print using two eyes at a greater distance than is possible with one. I before mentioned that if a subject be photographed, then viewed at the same angle as is included in the photograph, near to the eye, with binocular vision, the discrimination seems to be very much greater, and even for one plane alone, as now contended for by Mr. Burton.

As a matter of opinion, I do not think that if photography is to be in accordance "with the contention that a picture should be a translation of the scene as seen by the normal human eye," that the best possible focus even for one plane should be quite as sharp as a lens can make it, but, of course, there may be occasions when it is necessary. Mr. Burton does not now, from his remarks, appear to maintain the position that every plane should be equally sharp. In Mr. Dennis Taylor's paper, at the outset he concurs with the quotation above given from Dr. Emerson, and then endeavours on optical grounds to refute the principles of focussing as carried out by the naturalistic school. It appears to me that the one optical principle that Mr. Dennis Taylor has enunciated, and certainly clearly explained, is not the only one to be considered. He says: "It is obviously out of the question to represent binocular effects upon a plane surface," and again. "It is evident that no out-of-focus effect produced by one lens can possibly resemble or stand duty for the important duplication effect, the result of binocular vision." Now the fact of binocular vision appears to me the greatest claim *on scientific grounds* that the naturalists have for their method of focussing. Of course binocular effects cannot be produced except through the stereoscope upon plane surfaces, but the "important duplication" can.

A simple experiment will show Mr. Dennis Taylor that this is easily attained by inserting a stop with two apertures in a lens, and separated by a convenient interval. Taking a lens of, say, 15 inches focus, or that of good normal eyesight, with two apertures of $\frac{1}{8}$ inch (the limit of size deduced by Mr. Dennis Taylor), separated by a distance of $2\frac{3}{8}$ inch, or about the distance between the eyes: this should register, on a photographic plate, what a "sticking-plaister" brain would receive. The effect of binocular vision so registered will show a distance for a given focus, beyond which the separation of double images is so slight that they may be said to coincide. Taking this as a displacement of $\frac{1}{100}$th of an inch at a distance of 15 inches, the distance after which there would be no detrimental interference from the duplication would be about 50 yards. Now the aperture for a lens with the ordinary stop, to accomplish the same end, would be *f* 6. It is remarkable that this is about the ratio of aperture to focus of the single lens of the eye. The duplicating effect for near planes thus obtained with a lens with a binocular stop is most disagreeable, as, although we do have a duplicating effect in the eyes, it is not so distinctly appreciated, no doubt one important reason being that we really see more distinctly with one eye than the other; and from experiment I have found that, by enlarging the $\frac{1}{8}$ inch aperture in the binocular stop till the apertures more than meet in the centre, some very interesting results are obtained when the apertures are made so large that the duplicating effect is not pronounced.

Again, in a paper that I contributed to the Camera Club, I mentioned that I had had the opportunity of consulting an artist, Mr. Davis Cooper, who had for many

* As a matter of fact, Lord Rayleigh has not said so, but in a discussion on the alleged superior vision of savages, he stated that "the margin for improvement in the vision of civilized men was not great," and in answer to my enquiry Lord Rayleigh says, "I have no doubt that a perfect lens of aperture and focus of the eye would give somewhat better definition than does the eye."

years lost the sight of one eye, and in his case, after careful and protracted trial, he was of opinion that there was muscular effort to focus for different planes within a distance of fifty yards. Dr. Emerson was the first to enunciate the distinctly appreciable time required to adjust the focus for different planes, and point out that it was *not instantaneous*.

Now as one single eye, for example, which is considered normal, can appreciate different conjugate points within this distance, and as also duplicating effect with both eyes ceases to exist appreciably beyond the same distance, it appears to me that, for a lens of the focus of normal human vision, say 15 inches, one should employ a stop *f*/6 to be on a parallel, or the nearest approach to a parallel with that of normal human vision. The round stop, as it exists, takes away any disagreeable duplicating effect in reproducing a photograph of any scene (as seen), and at the same time maintains a correct ratio as regards its relation of aperture to focus; *f*/6 for a lens of 15 inches focus. I repeat that binocular vision appears to me to be one of the most powerful arguments that the naturalists have in representing on a plane surface the chief object of interest with the most pronounced degree of definition, and allowing the remaining portions of that picture to be subservient to that one plane.

I have not had very much time to investigate the use of the binocular stop, but it appears that if a separation of $2\frac{3}{8}$ inches at a distance of 15 inches corresponds to normal human vision, it will be easy to find experimentally the correct separation, or, if a round stop be used, the correct aperture (theoretically, of course, a constant), for different foci of lenses, be they longer or shorter. Artists alone must be the judges. I should much like to see the effect of a picture taken with a 6-inch focal length of lens, with a binocular stop showing pronounced duplication, and this reproduced upon a screen by the lantern with the same lens and stop. Duplication, of course, will cease in the image, and it is possible that a more stereoscopic effect might be thus attained. I very much appreciate the direction of Mr. Dennis Taylor's work, and were it not for binocular vision, the $\frac{1}{8}$ inch stop that he deduces as that for every lens would be correct on optical grounds alone, but the mere fact of binocular vision, of course, upsets this; and I think it also would have been well to take into consideration, in the first place, what the eye can do as an instrument, and then assigning a sight stop to photographic lenses to be on a parallel with it, instead of only taking the measurement of the iris and the focus of the crystalline lens, as though it were a perfect lens.

As far as I understand, the object of pictorial art, in the matter of drawing, is to render a truthful impression of what is *seen*, and nothing more. The *sharp* throughout photograph is a truthful record of *what is* from the one point of sight of the lens, and to appreciate it as a picture you must find a picture in it. It is the memory and record of all the scene in its proper relation as regards *mathematical angular measurement*, and not of the picture that can be recalled by the contemplation of any portion of that scene. If a scene is of uniform interest, record it as such, and you will have done as much as lies in your power to convey to the one viewing the photograph the pleasurable sensations the scene had for you. I still contend that artificial means must be used in connection with the eye to make it see any point as clearly as a well stopped-down photographic lens will represent it. It is evident on the above reasoning that pinhole photographs must be failures, artistically, unless the nearest plane included be distant fifty yards; of the *quality* of definition artists must judge.

MODERN DEVELOPMENTS OF PHOTOGRAPHY.

A paragraph which we published a fortnight ago led to the following expressions of opinion in a leading article in the *Daily Telegraph* last Friday:—

From the mouth of his recognised organ comes the wail of the photographer, and his plaint is to the effect that there is a distinct falling-off in the demand for photographs of celebrities. No longer, it seems, does the gilded youth of the day decorate his mantel-piece with the sun-pictures that succeeded the old engravings of "Pets of the Ballet." If he sticks up photographs at all, they are personal gifts with autograph inscriptions, and his old habit of investing in "cabinets" of popularities has been abruptly dropped. In vain is the reigning beauty of the hour set in a shop window to entice him to purchase her, either in the pose of languid laziness when swinging in a hammock, pouring out tea, investigating her own personal charms in a hand-glass, or, in still more daring and original mood, focussed in the very act of attempting to resuscitate a stuffed canary, or swallow an enormous muff in the middle of a snow storm. Eminent photographic firms no longer, we are told, look upon the photo-mania of a few years ago as a source of income. Well-known shops, "for years useful to artists in want of photographs of celebrities," are closed, and no man is bold enough to adventure re-opening. The peripatetic vendors of like wares have disappeared from the public streets, or filled their carts and barrows with more saleable merchandise, and, according to the same trade authority, the Automatic Photographic Supply Company has discovered that the fascination once exercised by likenesses of ladies and gentlemen of the dramatic profession has sensibly waned, even though these gifted personages were to be procured, like everything else nowadays, by dropping a penny in the slot. Amongst learned and scholarly circles there is still a demand for bishops, men of letters, and "advanced thinkers" of various schools. Poets and artists and novelists are asked for and invested in, and there is still extant a fondly loyal class delighting in the possession of photographs of all "Royalties" of all countries, at all ages, and in all positions. It must also be admitted that the "family album" is still a cherished institution, and that usually dreary volume is highly useful as a record of the fitful changes of fashion, a study of the rise and fall of crinoline, and chignons, and similar eccentricities as extinct as the dodo. The rage for the purchase of celebrities or "notorieties," however, is stated to be exhausted. What has led to this remarkable change in public humour, and whence comes the disappearance of a once-popular whim? This is a question which the authorised organ of the craft is powerless to answer, contenting itself with a regretful record of the facts. A little investigation may possibly furnish some clue to the mystery.

Perhaps the secret lies in the fact that, while the purchase of public photographs issuing from well-known ateliers has sensibly decreased, the practice of the art of photography has spread enormously among the ranks of the amateurs. Really beautiful, sympathetic, and serious work is shown year after year in the photographic exhibitions; the

mysterious varieties of the various "processes" are being gradually mastered by the amateur apprentices; and the cult has been brought to such perfection that high-class photography may in truth be said to have captured Phœbus Apollo, and made an artist of the sun-god. The serious artist-photographer, then, would scorn to buy a picture not of his own producing, and it is likely that a similar spirit inspires his more comical brother, who has taken up the merry pastime of playing with one of the various amusing forms of "detective"—or, as they are often very properly termed, "demon" cameras. These ingenious "snap" detectors—remorseless recorders of a chance attitude, possibly inartistic, nay more, possibly compromising—are concealed in despatch or cigar boxes, peep out with enquiring eye from the back of a harmless, neatly-bound book, or can even hide their inquisitive eyes in the most innocent-looking of brown-paper parcels. With a couple of dozen "dry plates," a combination of a string and a shutter, and this apparently guileless instrument in his possession, the owner has only to learn the knack of holding it steadily and firmly against the body, and he can literally "shoot his friends flying," when they never dream of pose or smile. The flight of birds, the movement of a horse and its rider in the very act of topping a hurdle, the rush of a racing yacht through the foam—they have even gone so far as to be able to snatch the changing shapes taken by a charge of small-shot in mid-air—are all picturable by the new race of "Peeping Toms." The pictures are wonderfully brilliant and sharp, and the detective camera fairly takes rank with Edison's phonograph as part of that new movement which may be termed the ceaseless surveillance of science. How Fox Talbot and Daguerre, and others, who almost contemporaneously gave to the world the secret of producing a photographic image by the action of light upon the sensitive salts of silver, would have wondered could this "fin de siècle" result of their experiments have been prophetically revealed to them! Their advanced disciples are now numbered by millions, and it is, no doubt, largely to the spread of amateur photography, especially of this humorous though not altogether comforting detective character, that is to be attributed the alleged falling-off of the demand for the works of the professionals.

Of course, no one likes the idea of being caught, fixed, developed, and mounted, when unprepared. It is not given to all men and women to be habitually graceful, and even the most elegant youth, whose permanent public pose is that described by lady novelists as suggesting "a young Greek god," may sometimes relapse from his habitual Hellenism, and, what is more to the point, be caught in the act. It is hard, very hard, to evade the all-searching eye of this remorseless inquisitor. That astute convict, "Henry Fergusson," as told by our Paris Correspondent the other day, in spite of the fact that he possessed "finely-cut features" and had "hair falling in ringlets over his shoulders," displayed a resolute antagonism to be photographed. He made grimaces at the lurking camera, and wriggled out of focus, despite all the efforts of the prison authorities of Rennes. He may have had some rooted personal objection to having his "finely-cut features" sent to all the police albums of diverse countries; for many convicts entertain a singular prejudice against this artistic custom. It was only after he had spoiled many negatives, and successfully escaped all recording recognition a dozen times, that he was "snapped" when in the presence of the Judge and jury of the Assize Court by a concealed camera, and in this unsuspicious moment handed down his features and his ringlets to posterity and the French police. During the forthcoming decade of his enforced seclusion from society, owing to the lamentable fact that he had contracted a habit of collecting jewellery not legally his own, he will have leisure wherein to reflect on this irritating example of the surveillance of Science.

"Mr. Fergusson," of Rennes, however, is by no means the only objector to the "snap" system, for complaints on the subject are to hand from erudite and scholastic circles. At a certain large public school it is one of the canons of chastisement that when a form-master is under the painful necessity of caning a truculent or perversely stupid boy, the punishment must be so inflicted that the cane is raised no higher than the master's own shoulder. This benevolent and merciful rule was, it appears, habitually neglected by one of the form-masters, whose style was of the lofty-brandishing order. Various chastised culprits from time to time made protest against this literally high-handed proceeding. They requested that the regulation horizontal, and not the perpendicular movement, should be rigidly adhered to, and protested as strongly as did their cricketing forefathers, before the rules were revised, against the "over-hand delivery." The castigator stoutly denied the accusation, and the situation became very involved indeed, until one of the youthful offenders bethought him and bought a detective camera. At the very moment of punishment, when naturally, as the correspondent puts it, "the master's attention was otherwise occupied," a flash on a dry plate exhibited beyond all possibility of doubt the cane elevated above the regulation point. The fatal film was shown to the head-master, who, with impartial Spartan severity, rebuked the transgressing under-master on the evidence of the photograph, and at the same time gave the audacious young photographer four hundred lines of a recognised classical author to write out for "playing in class." These instructive stories point out some of the possible terrors of the new photography, but to continuously upright and properly-behaved people there should be no ground of apprehension at all. "So act," says Kant, "that the motive which influences you shall be fit for law universal;" and, coming from the region of pure ethics to more sensuous æsthetics, it might be suggested as a parallel maxim, "Always conduct yourself in such a picturesque and graceful fashion that you may boldly defy the doings of the demon camera, and stand in no fear of a random snap-shot."

The uses of celluloid seem to be increasing almost daily, and particularly in connection with photography and kindred arts; it is now being used considerably as the basis of photographic reproductions by the photo-mechanical processes, and is peculiarly adapted to such work, owing to the ease with which it lends itself to retouching, and artist work either with brush pencil, or pen. Its employment in this field will doubtless expand rapidly and permanently.

Dr. R. Krugner writes to *Anthony's Bulletin*:—"It is very well known to me that eikonogen has the displeasing quality of turning sometimes to a dark colour; but this is of no importance against the other excellent qualities of the product, if the discolouring takes place only on the surface of the crystals, and if the interior of them rests unaltered, which is the case generally. By testing, you will find the above confirmed. It is not known with certainty by what the discolouring is caused, but you can be assured that the best is being done to prevent it."

PHOTOGRAPHY: THE SCIENCE AND THE ART.

We often hear photography spoken of as the art-science, a combination of terms which seems somewhat contradictory, but which is really most comprehensive and accurate. Science has been defined as "knowledge reduced to a system," and when examined from this standpoint, both in its details of operation and in the methods of its application, photography may fairly claim to be one of the most exact branches of science. It is, indeed, not without its experimental side, in common with all branches of science, but in the present acceptation of the term, the camera is as much a scientific instrument as the engineer's transit or level, and for scientific purposes its uses may be acquired as methodically.

The application of the camera and its work to scientific pursuits has, however, not generally been regarded altogether as legitimate as some other instruments, and for a rather curious reason, namely, that it is rather an artistic than a scientific instrument; while, at the same time, the artist is sometimes disposed to give the camera the cold shoulder because, forsooth, it is a scientific instrument! and so, while claiming to be an art-science, photography flits midway between the two camps, like the bat in the fable, and is not fully accepted by either side.

Now, photography is really a science, and is also as thoroughly an art as is any other division of that much-abused term; but it is not both at the same time, and, without reopening an old discussion or stirring up old antagonisms, it may be worth while to examine somewhat the difference between the scientific and artistic applications of photography.

When the discoveries of Daguerre, and Niepce, and Talbot first made photography practicable, the immediate thought of everyone was of its application to portraiture: and even to-day, if one speaks of a photograph, without any further definition, it is generally understood to mean a portrait. Landscape photography, before the introduction of modern dry plates, was so little followed as to be of minor importance, and with the exception of some professional work in architectural photography, the artistic side of photography was mainly limited to portraiture.

Since the advent of the amateur into photography, however, we hear much more about photography as an art, and the ease with which the operative details of manipulation are mastered has made it possible for men of cultivated artistic tastes to exercise talents which might otherwise have remained purely critical. The result has been the development of what may properly be termed a "school" of artistic landscape and group photography, consisting of a number of earnest men of true artistic taste, whose time and opportunity have not permitted to acquire the technical skill with the brush, or crayon, or etching needle which, in former days, would have been necessary to make their talent evident, but who can, with the aid of the camera, show their ability, and gratify their own artistic sense in a manner otherwise unattainable.

Dr. Emerson, to name but one, has amply demonstrated by his published works how fully comparable the work of the camera may be made to the work of the needle and acid; and there are not wanting to-day those who openly express their preference for photograph to etching. The details of the latter process are quite as mechanical as those of the former, and the absence of colour is chargeable to both alike, and to what extent the public opinion upon the subject is due to the influence of unreasoning fashion, the reader can judge.

The artist photographer does not use his smallest stop for the purpose of obtaining the painful microscopic sharpness of definition which the mechanical taste may deem essential; he does not need to be taught any cast-iron rules about the direction of the light, or the introduction of the inevitable foreground stump. When his negative is made, he does not improve (?) it by printing the sky full of clouds, whose lighting gives the lie to every shadow in the picture. Indeed, his work is as marked by what he does *not* do as it is by what he does, and if he succeeds at all in any degree, he succeeds in leaving the impress of his own taste upon all his work.

Turning now to the use of photography as a science, it will be seen how different and yet how legitimate its claim to the title may be made.

Probably the use of the camera for astronomical purposes is one which would first suggest itself as a scientific application; but, as a matter of fact, stellar photography—while most valuable and interesting—can scarcely lay claim to the highest place under this head. The modern science of photogrammetry, using as it does the image on the plate in connection with measured horizontal and vertical angles, the whole to be combined with a similar record made from another standpoint to form an accurately plotted survey, is a far better example of the use of photography as a science. So, too, the boundless field of photo-micrography, and the use of the camera as a record for scientific experiments whose truth is beyond impeachment—these need only to be mentioned to be recognized as scientific uses totally distinct from the artistic use of photography.

The distinction between the two terms can readily be kept in mind, and if the artist would only remember that the camera belongs to him as an instrument of his art as much as do his brushes and his pencil, and if the engineer would also recall the fact that the same pencil which he uses for his accurately drawn diagrams may, in the hands of the artist, produce the sketch of a masterpiece, there would be less discussion about the meaning of art-science.—H. H. S., in *The American Journal of Photography.*

Photographers and the Phonograph.—Photographers consider it necessary in these days of competition to have special attractions in their parlours, and I hear of one leader in the field of photographic art who has a phonograph to amuse his customers while they are waiting for sittings. It is Falk, and as he numbers many prominent actors and singers among his patrons, the *repertoire* of his phonograph contains some great novelties. Patti and Tamagno sang into it. Edwin Booth recited a portion of Hamlet's soliloquy, which it gravely repeats, and Col. Bob Ingersoll has filled it up with some remarks about brimstone which make one feel hot and uncomfortable.—*New York Press.*

A Troublesome Customer.—To take a man's photograph against his will, says the *Daily News*, seems as difficult an operation as the proverbial taking a horse to the water and making him drink. So the French authorities have found at Alençon in their attempt to secure, according to law, a permanent memento of a prisoner who is now undergoing ten years' imprisonment for numerous robberies. It was in vain that he was brought in sight of the photographic camera; it was in vain that the official photographer cunningly hid under his arm a portable apparatus capable of taking an instantaneous likeness. The instant the dread engine made its appearance, the prisoner made such frightful grimaces that his own mother, as the popular expression has it, would not have known him.

Notes.

Lord Salisbury deserves the thanks of photographers for the vigorous utterances he made some time ago about the "almost inconceivable stupidity" of an English Custom House officer who interfered in a vexatious manner with the exposed plates of a returning tourist. The dynamite scare is not yet over at our seaport towns; every article of baggage has still to be opened for inspection, but the officers do not interfere to an unnecessary extent with photographic apparatus and plates. At the English frontier there is more delay and examination in passing the revenue inspection than anywhere else in civilised Europe. Chiasso and some few other places on the Swiss-Italian frontier are bad in this respect, but the inspection is tempered to passengers with through tickets who have come long distances. Smuggling into Italy from Switzerland flourishes on the southern border of Canton Ticino; the birds of the air, the fishes of the river, the winds of heaven, and the handkerchief-tied-up dinners of the labourers, all vie with each other in pouring contraband goods into Italy. The Italian Government has often complained to the Swiss Government about this, and the latter has replied, in the politest of terms, to the effect that it is not its business to provide revenue officials to protect Italian interests. The Italian Government should put such moderate imposts upon foreign goods as to make petty smuggling by individuals unremunerative.

Dr. Janssen has left, or is about to leave, the Observatory at Meudon, to make the ascent of Mont Blanc in a novel manner and for a special purpose. His object is to make observations at a high altitude in relation to certain problems connected with the solar spectrum, for the dirt floating in the lower strata of the atmosphere cuts off some of the rays of the sun which would otherwise reach us. Because of his state of health Dr. Janssen will not make the ascent on foot, but will be carried in a kind of specially designed slung hammock to the top; fifteen porters will do the carrying work. Dr. Janssen intends to spend several days at the Bossons chalet, 4,450 mètres above sea-level, where he will have a small observatory fitted with meteorological instruments.

In relation to spectroscopic observations at high altitudes, Captain Abney one evening told a good story in a Royal Institution lecture, and it was somewhat to the following effect. He was doing some spectroscopic work on the Riffel, when a curious Yankee wished to know what he was about, and Captain Abney told him about the problem of the presence of hydrocarbon vapour—a sort of alcohol—between the earth and the sun. That American returned to the hotel, and reported that there was a lunatic up on the mountain, who had told him that soda had been found in the sun, and that now he—the lunatic—was searching for brandy in the realms of space.

The prospectus of the fourth Annual International Exhibition of the Photographic Society of India is in circulation. The Exhibition will be held in Calcutta during December. Five gold, fifteen silver, and fifteen bronze medals are offered for competition, of which one gold, five silver, and five bronze are offered to the amateurs of the world; one gold, two silver, and three bronze to amateurs of India and Burmah; and one gold, two silver, and two bronze to amateur members of the Photographic Society of India. In addition to the above, a special medal will be given for the best photograph in the Exhibition. Copies of the prospectus and full particulars can be had from Mr. J. S. Gladstone, Woolton Vale, Liverpool.

Strolling the other day through a large cemetery in London, we noticed that in several instances photography had been utilized for preserving a memorial of the dear departed. In many of the gravestones there was an aperture cut the entrance to which was sealed by a plate of glass, and inside the little casket thus formed was a vase of flowers, and in some cases a photograph. The effect was pathetic, especially in the case of children; but it was sad to see how often the fugitive silver print had become almost obliterated, most probably this being hastened by the damp surroundings of the picture. This custom of ornamenting the shrines of the dead with the portraits of those who have gone is of course not new, as every visitor to the Egyptian Room at the British Museum can ascertain for himself. The paintings on the mummy cases there look as fresh as the day they were executed so many centuries ago. But the colours used—chiefly earths of a stable character—are far more permanent than the metallic deposit laid on paper by light.

But there is at least one process which would suffer no decay by exposure to the atmosphere, and if this were once understood by the public, it would give a great impetus to the practice of this particular branch of photography. We allude, of course, to the ceramic method, by which the image is burnt-in to its support. Such photographs can be made either upon porcelain or enamelled copper, and the latter material would be preferable for churchyard monuments. A well executed burnt-in photograph has no rival, for while it has all the best qualities of a silver print, it is as imperishable as anything on this globe can be, and its utter absence of all texture gives it a depth which no other printing method can boast.

What is called post-mortem photography must be always more or less unpleasant, and ought to be well paid for. The most repugnant task in post-mortems is without question that which relates to the photographing of corpses which are found from time to time floating in the river Thames. A journalistic friend has just related the result of a casual interview with one of the Thames police, and the officer in charge of the mortuary of a riverside parish. It appears that these

bodies, when not identified, are always photographed. There is, however, no accredited photographer attached to the police force, and an outside photographer is always engaged. The sum paid for photographing these bodies in all stages of decomposition is, we are informed, £2. Not an extravagantly liberal sum, considering that a copy has to be sent to the head-quarters of each division of the police throughout the metropolis. But, no doubt, the photographer makes his own terms; if he is satisfied, we do not know that anybody has a right to say a word.

Her Majesty the Queen, as is well known, is a great lover of photographs, and every part of her various palaces has formed at some time or other subjects for the camera. But the Queen is also a collector of portraits of those who have distinguished themselves in her service, from the highest in command to the humblest soldier in the ranks. Many of these portraits are burnt-in photographs upon metal, and one worker in London was at one time constantly in receipt of commissions to produce them, very often from faded silver prints. So that it will be seen that Her Majesty has a little national portrait gallery all to herself, and one in which the pictures are warranted permanent.

This thought brings us to a subject which has often before been broached, but which, like the farmer at the county dinner who drank claret in mistake for port, seems to get "no further." It is quite time that we had a national photographic portrait gallery, and it might be made an adjunct of the gallery already in existence, which is presently to find a new home. The photographic section need not take up much room, for the portraits would be in the form of miniatures, and a large number would cover small wall space. When possible, an oil painting should have hung near it the photograph of the original, so that future critics may be able to compare the two. We have thus shown that in many ways there will come a demand for ceramic pictures, and those of an enterprising cast of mind will do well to turn their attention towards the subject.

The question of the necessity of swimming is very much to the front just now; in fact, it always is in the summer months. To those who can swim nothing is easier than swimming; to those who cannot, and make futile efforts to acquire the art, nothing is more difficult. A swimming class which was established recently in South London for teaching swimming on land, and which met with some success, suggests that the various movements might be made tolerably plain by means of a series of photographs. To photograph a person swimming in the water is impossible for practical purposes. The distortions would be an obstacle; but the South London plan was to turn a piano stool to account as a substitute for water. It is clear that, so long as the stool is fastened securely to the ground, the motions necessary for swimming could be well displayed, and if so, the various movements could be photographed. We are not going to say that the resultant pictures would not be open to ridicule as pictures, but that is not our affair.

It is reported that the district through which the Manchester ship-canal finds its way is about to be photographed on a most extensive scale. Materials for a lecture on this gigantic engineering work have been collected, and, as a lecture now-a-days is nothing unless it is illustrated by an optical lantern, an enterprising photographer has obtained special facilities for photographing every spot and locality, including notable incidents and features in the work of constructing the water-way. It appears that no fewer than two thousand negatives have been already taken, and as many more are likely to be added to the store before all the points of interest are exhausted. It is rather curious that a perfectly new work of this kind should receive so much attention, when the river Thames, which is full of lively interest from its source to its mouth, should have been comparatively neglected. The Thames has been photographed in spasmodic fashion, but nothing like a systematic series of photographs exists. The work surely should be worth undertaking.

One of the oddest uses to which a photograph can be put is to eat it! Yet a singular fact of this kind is recorded by the author of an interesting book just published giving an account of the French nunneries. As a teacher of gymnastics, which the Government insisted should be introduced into the religious establishments to improve the health and physique of the inmates, she had an opportunity of seeing the inner life of the nunneries, and graphically describes the morbid condition of mind which discipline and monotony induce. "Many," she says, "were ailing, and to cure themselves put very small photographs of the heart of Jesus into the soup and swallowed them!" Apart from the extraordinary purpose for which these photographs were used, the fact that such photographs were in existence is a curious revelation of what may be called one of the bye-ways of photography. One is tempted to enquire whether any other religious symbols are photographed, and the photographs sold to such as derive comfort from gazing upon them.

Photographs are more often the cause of quarrels than is generally suspected. The latest example is that of a lady who was lately charged at the North London police court with assaulting a gentleman by striking him in the face with a glass. The whole thing arose out of being photographed. The attitude the lady assumed when the photograph was taken appears not to have been pleasing to the gentleman, and it seems to have rankled in his mind until night, when his remonstrances seem to have taken so severe a shape that the lady flew at him, so the prosecutor asserted, and bit his wrist. This is sad, and one would like to know what was the precise attitude which excited the anger of the gentleman, just as a warning to other people.

HOW THEY WERE PHOTOGRAPHED.

THEY came in late in the afternoon, all talking at once.

"We want our tintypes taken."

"Yes. Altogether?"

"In a group."

"Any particular style you'd like?"

"Oh, we want something picturesque. Yes, we want it artistic—an outdoor scene, you know."

The photographer quickly whee's up a mountain view background, waltzes a wooden-looking "rock" into the foreground, props up a rustic fence at one side, and throws down a shaggy, grass-suggesting mat before it. While he is composing this medley from the inexhaustible beauties of nature, the girls discourse on the subject in hand.

"Belle, you sit on the rock and I will stand beside you; Grace can lean on the fence, and May, you sit on the floor. We ought to have a book to be looking at. Ah, here's an album; that will do. Dora, which side of my face would be the best to have taken?"

"The outside," said Dora, promptly.

"I wish we had a parasol," says Grace.

"Be quick as you can," interrupts the photographer, realizing how precious is every moment of the fast-fading light. Dora bestows upon him a look which plainly says "with intent to annihilate."

"We pay you by the job, not by the hour. Do not presume to hurry us."

At last they locate themselves according to the dictates of their own sweet and wayward fancies.

"Ah, my," exclaimed Belle from the rock, "what an awfully uncomfortable thing this is to sit on"

"Put your hand on my shoulder, Grace."

Finally all seems in readiness, when, just as the photographer is about to remove the cap to expose the plate, May suddenly exclaims from the floor:

"Hold on a minute, Grace, you ought not to be standing, you are too tall. Change places with me."

Then ensues a general scrambling and rearranging, Belle improving the opportunity to try for a softer spot on the rock.

"Am I looking at the right place?" May anxiously asks of the photographer, as if the sun would certainly fail to do its desired work if her head was not turned at just the most becoming angle.

"Yes," replies the much harassed personage addressed, heroically choking back unholy utterances. "Sit perfectly still now."

He removes the cap, and a brief and blessed silence ensues. When he replaces the cap for a moment the chorus breaks out.

"Oh, my goodness—dear me—I never—why, I was just——"

"Keep just as you are," says the photographer, authoritatively, unexpectedly removing the cap again, and thus effectively shutting off the threatened deluge of remarks.

The poor light necessarily made the exposure unusually long, and when at last it is over, a volley of deep and revengeful groans comes from the girls as the photographer disappears with his plate.

Then their tongues are loosed.

"My! I feel all tied up in a bowknot."

"Goodness! but I'm tired standing so long."

"I never knew any one to be so long taking a tintype."

"Oh, I feel as if I had just had a tooth pulled—so thankful it is over."

"Oh, see this picture of some girls in a boat. Why didn't he say he had a boat?"

"I don't think he is very agreeable, anyway. All he thinks of is to get it over with."

"Oh, here he comes with the pictures."

Now they gather around the man with the pictures, all talking excitedly.

"Oh, oh, just look at me."

"Just see the way my eyes look."

"My head is held too high, and I asked you"—

"Oh, see how my dress looks," &c., &c., until at last they relinquish the artistic treasures long enough to have them put in envelopes. Then they pay for them and go out, leaving the long-suffering photographer free to relieve his overwrought nerves in any form of speech he thinks will be most soothing to his feelings and expressive of his sentiments.—*Boston Herald.*

A NEW SOCIAL FANCY.

ONE of the latest fads of social swelldom is the "Trousseau Album"; and although it has been mercilessly ridiculed in various quarters, we think the idea will increase in favour, and that it has come to stay. An album of this kind, even if not as extravagantly gotten up as the one here described, will without doubt always be an object of interest and curiosity, the more so as the years elapse. To a family in which it descends as an heirloom its value cannot be measured by money; while to the student of history and social philosophy a work of this kind—a century hence—would prove a perfect storehouse of information.

To properly arrange an album of this kind is not an easy task, as it requires not only good judgment on the part of the photographer, but of the modiste and binder as well, to which must be added a liberal outlay of money.

The specimen which came under the notice of the writer was a perfect specimen of its kind. Sufficient funds had fortunately been left the family, after securing the titled foreigner as a husband for their daughter, that they were free to indulge in this whim of the bride. The album was handsomely bound in Turkey morocco, and fastened with gilt clasps. On the corner was emblazoned a gorgeous crest and coat-of-arms in gold, silver, and bronze. The inside of the cover was lined with heavy watered silk, as was the fly-leaf, which protected the illuminated title pages. Then followed on opposite pages a portrait of the bride and her foreign consort. On the next left-hand page was a full-length photograph of the bride in her wedding dress, veil, orange blossoms and all, just as she had stood before the altar. Opposite, on the right-hand page, a dress similar to the photograph was constructed in miniature of the identical fabrics, silks, satins, and laces, as was the original; even the garniture of orange blossoms being painted on the model. This was protected by a deep hinged matt, made of the finest pebble board, with gilt bevelled edge. The next picture represented the bride in her tailor-made travelling dress, which was worn on the wedding tour immediately after the ceremony. On the opposite page we again had a miniature model of the original fabric, showing the colours and materials, which could not be reproduced by the camera, and so on through the whole category. Evening dresses, street costumes, house robes, followed one after the other, through the whole list of trousseau, the pose of the bride being varied in each picture so as to show off the dress and its fair wearer to the best advantage, while on the opposite side was to be seen the exact model of the identical fabric, always, of course, protected by the deep matt. The whole album did credit to the different artists who were engaged on it.—*American Journal of Photography.*

SUBTERRANEAN PHOTOGRAPHY.—Mr. Langlois has constructed an apparatus for subterranean photography, in cases where the only means of communication to underground localities is a narrow shaft, and the instrument must be manipulated from the surface. His invention consists of a *camera obscura* of small size, the plate being about two inches square, and the focus of the lens being of comparatively short range. The camera, mounted in a metallic case or tube, open on one side, can be lowered by means of a cord or small chain attached to the tube. The camera is pivoted within the tube, at its upper end, so that it can be kept at an angle by means of a cord or small chain fastened to the lower end of the camera. Above and below the camera are placed rows of incandescent lamps. When the apparatus is lowered, and the camera made to incline outward from the case, the current is turned on and the plate exposed. The photographs thus obtained are said to be excellent.—*Mechanical World.*

Literary Notices.

The Evolution of Photography. By John Werge. (*London: Piper and Carter*, 1890.)

This book consists of 139 pages devoted to the history of photography chronologically arranged, followed by 173 pages of articles which, at different times, Mr. Werge has contributed to photographic periodical literature.

As regards the first part of this book, it is interesting because it deals with subjects with which Mr. Werge, as a member of the photographic fraternity of the old school, was, to a large extent, personally conversant. He tells of men and events which played their part in the photographic world before the new race of photographers of the gelatino-bromide dry plate period came into existence. He has also been careful to collect and publish the portraits of many pioneers of photography, and sometimes took special pains to achieve this result. For instance, he obtained the likeness of Josiah Wedgwood from Mr. Godfrey Wedgwood, photographed from a plaster cast taken after death, and the portrait of Nicephore Niepce from the Mayor of Chalons-sur-Soane. Sir John Herschel's portrait was obtained by him from Mr. H. H. Cameron, and he took pains to specially obtain a few others. The following is the complete list of those given in the book: Josiah Wedgwood, Nicephore Niepce, the Rev. J. B. Reade, Henry Fox Talbot, Sir John Herschel, L. J. M. Daguerre, J. F. Goddard, F. S. Archer, Dr. R. L. Maddox, and Richard Kennett. We should have liked to have seen those of Thomas Sutton and Major Russell in the list. The portraits have been well reproduced by the collotype process by the Autotype Company; the latter were about the earliest commercial pioneers of that process in this country.

The work consists largely of personal reminiscences, and is written in easy narrative style, which makes it all the more interesting; and the fact of its being arranged in chronological order renders it easier for the reader of the present to follow the march of discovery in the past. Mr. Jerome Harrison has written a little book on photography, in which historical events are given in chronological order, so Mr. Werge does not stand so much alone in this arrangement as he seems to think, judging by some remarks in the preface.

More might have been said by Mr. Werge about the collodio-bromide emulsion process of Messrs. Sayce and Bolton than the three lines given to it on page 135, and might have been done without taking notice of recent disputes, but summarising only the original utterances of 1864. More also should have been said than the three lines given about Gaudin's position in relation to the origination of gelatine negative processes.

The facts are, that on the 15th of April, 1861, M. Gaudin published an article in the journal *La Lumière*, of Paris, in which he set forth in minute detail, and giving the proportions, how he prepared a gelatine emulsion containing *washed iodide* of silver. With this emulsion glass plates were coated, and the emulsion made to adhere thereto by means of an albumen substratum. These plates were exposed in the camera, and developed by means of a solution of tannin to which a few drops of solution of nitrate of silver had been added.

More than ten years later, Dr. Maddox first published, in *The British Journal of Photography* of September 8th, 1871, how he made an *unwashed bromide* of silver gelatine emulsion, which he spread upon glass and upon paper; then printed images thereupon from negatives, and developed with a solution of pyrogallol containing a trace of nitrate of silver. He put it forth as a positive printing process, and said nothing in the article about its being of any use for negatives.

Between the above dates, and in the journal last mentioned, another experimenter published on the 17th of January, 1868, how he coated a glass plate with a gelatino-bromide of silver *unwashed* emulsion, dried and exposed it, then brought out the image with an alkaline developer. He said:—"I wanted to have a solution which would give a good dry plate by simply coating a sheet of glass with it, and allowing it to dry on the levelling stand, thereby abolishing baths, washings, and the use of collodion in the process." This was put forth as a gelatino-bromide negative process, and one to be used with alkaline development, and was published three years before Dr. Maddox printed his emulsion process for positives.

When we have a school of historical criticism in photography composed of men whose duty it will be to see to the accuracy of historical utterances, their chief attention will have to be given to the original text of the three articles just mentioned, when investigating the facts about the origin of gelatine negative processes. When that time comes, we shall hear much more about the part taken by M. Gaudin in the origination of those processes than we do at present, or than is given in Mr. Werge's book.

The following narrative of the manner in which modern gelatine plates gradually came into commercial use will serve to illustrate Mr. Werge's style of writing, and of describing circumstances of which he was cognisant:—

In 1873, Mr. J. Burgess, of Peckham, London, advertised his gelatino-bromide emulsion, but as it would not keep in consequence of decomposition setting in speedily, it was not commercial, and therefore unsuccessful. It evidently required the addition of some preservative or antiseptic to keep it in a workable condition, and Mr. J. Traill Taylor, editor of the *British Journal of Photography*, made some experiments in that direction by adding various essential oils; but Mr. Gray—afterwards the well-known dry-plate maker—was most successful in preserving the gelatine emulsion from decomposition by the addition of a little oil of peppermint; but it was not the emulsion form of gelatino-bromide of silver that was destined to secure its universal adoption and success.

At a meeting of the South London Photographic Society, held in the large room of the Society of Arts, John Street, Adelphi, Mr. Burgess endeavoured to account for his emulsion decomposing, but he did not suggest a remedy, so the process ceased to attract further attention. Mr. Kennett was present, and it was probably Mr. Burgess's failure with emulsion that induced him to make his experiments with a sensitive pellicle. Be that as it may, Mr. Kennett did succeed in making a workable gelatino-bromide pellicle, and obtained a patent for it on the 20th of November, 1873. I procured some, and tried it at once. It gave excellent results, but preparing the plates was a messy and sticky operation, which I feared would be prejudicial to its usefulness and success. This I reported to Mr. Kennett immediately, and found that his own experience corroborated mine, for he had already received numerous complaints of this objection, while others failed through misapprehension of his instruction; and very comical were some of these misinterpretations. One attempted to coat the plates with the *end* of the stirring-rod, while another set them to drain in a rack, and those that did succeed in coating the plates properly invariably spoiled them by over-exposure or in development. He was overwhelmed with correspondence and visitors, and, to lessen his troubles, I strongly advised him to prepare the plates himself, and sell them in that form ready for use. He took my

advice, and in March, 1874, issued his first batch of gelatino-bromide dry-plates; but even that did not remove his vexation of spirit, nor lessen his troublesome correspondence. Most of his clients were sceptical, and exposed the plates too long, or worked under wet-plate conditions in their dark rooms, and fog and failure were the natural consequences. Most, if not all, of his clients at that time were amateurs, and it was not until years after that professional photographers adopted the dry and abandoned the wet process; in fact, it is doubtful if the profession ever tried Mr. Kennett's dry plates at all, for it was not until Mr. J. W. Swan and Messrs. Wratten and Wainwright issued their dry plates that I could induce any professional photographer to give these new plates a trial, and I have a very vivid recollection of the scepticism and conservatism exhibited by the most eminent photographers on the first introduction of gelatino-bromide plates.

For example, when I called upon Messrs. Elliott and Fry to introduce to their notice these rapid plates, I saw Mr. Fry, and told him how rapid they were. He was incredulous, and smilingly informed me that I was an enthusiast. It was a dull November morning, 1878, and I challenged him, not to fight, but to give me an opportunity of producing as good a picture in quarter the time they were giving in the studio, no matter what that time was. This rather astonished him, and he invited me up to the studio to prove my statement. I ascertained that they were giving *ninety* seconds—a minute and a-half!—on a wet collodion plate, 10 by 8. I knew their size, and had it with me, as well as the developer. Mr. Fry stood and told the operator, Mr. Benares, to take the time from me. Looking at the quality of the light, I gave *twenty* seconds, but Mr. Benares was disposed to be incredulous also, and after counting twenty, went on with "one for the plate, and one more for Mr. Werge," but I told him to stop, or I would have nothing more to do with the business. The plate had twenty-two or three seconds' exposure, and when I developed in their dark room, it was just those two or three seconds over-exposed. Nevertheless, Mr. Fry brought me a print from that negative in a few days, and acknowledged that it was one of the finest negatives he had ever seen. They were convinced, and adopted the new dry plates immediately. But it was not so with all, for many of the most prominent photographers would not at first have anything to do with gelatine plates, and remained quite satisfied with collodion; but the time came when they were glad to change their opinion, and give up the wet for the dry plates; but it was a long time, for Mr. Kennett introduced his dry plates in 1874, and it was not until 1879 and 1880 that professional photographers had adopted and taken kindly to gelatine plates generally.

With amateurs it was very different, and many of their exhibits in the various exhibitions were from gelatine negatives obtained upon plates prepared by themselves, or commercial makers. In the London Photographic Society's exhibition of 1874, and following, several prints from gelatine negatives were exhibited, and in 1879 they were pretty general. Among the many exhibited that year was Mr. Gale's swallow-picture, which created at the time a great deal of interest and controversy, and Mr. Gale was invited over and over again to acknowledge whether the appearance of the bird was the result of skill, accident, or "trickery"; but I don't think that he ever gratified anyone's curiosity on the subject. I can, however, state very confidently that he was innocent of any "trickery" in introducing the bird by double printing, for the late Mr. Dudley Radcliffe told me at the time that he (Mr. Radcliffe) not only prepared the plate, but developed the negative, and was surprised to see the bird there. This may have been the reason why Mr. Gale was so reticent on the subject; but I am anticipating, and must go back to preserve my plan of chronological progression.

RATHGEBER FUR ANFANGER IM PHOTOGRAPHIREN UND BEHELF FUR VORGESCHRITTENE. Von Lieut. Ludwig David. (*Halle a. S.: Wilhelm Knapp.*)

THIS is a modest little book written in a concise and popular style for beginners. It is divided into two parts, the first treating of the negative, and the second of the positive process; the whole is illustrated by eighty-six engravings. As frontispieces are representations from a photographic negative and positive respectively of the same picture. At the end of the book samples are given of photographic labels for the various materials used by the photographer.

PHOTO-CHEMICAL INVESTIGATIONS.*

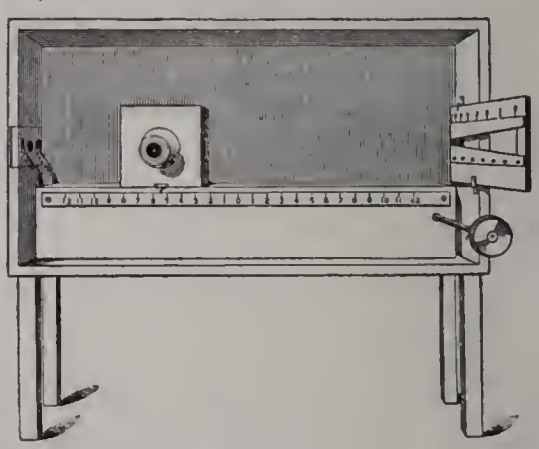
BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

II.—INSTRUMENT FOR MEASURING DENSITIES.

WE proceed to describe the instrument for measuring the density of the deposit. It is based on the relation existing between density and opacity. We measure the opacity of the plate, and, in order to avoid calculations and references to tables of logarithms, the scale of the instrument is so arranged as to read the logarithm of the opacity, which is the density. The reason why we prefer to have the results expressed as density is because the density is a measure of the amount of silver deposited, or of the chemical work done by the light.

The instrument pictured in Figs. 1 and 2 consists essentially of a small Bunsen photometer similar to those

FIG. 1.



used for testing the illuminating power of gas. The paper disc with its grease spot is placed in a small cubical

FIG. 2.

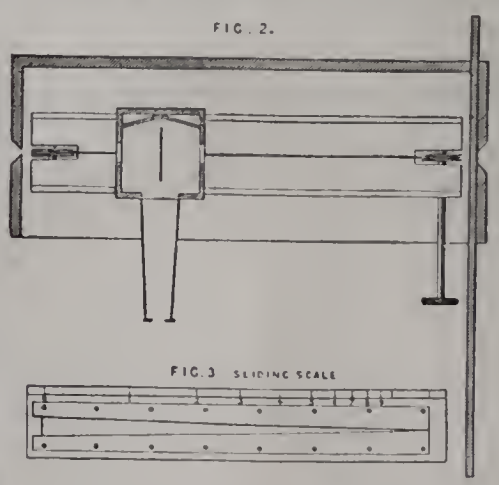


FIG. 3 SLIDING SCALE

chamber. The chamber carries an eye-piece, through which an image of each side of the disc can be viewed in two small mirrors, and so compared. The chamber can be made to slide in a straight line on a support by turning

* Continued from page 599.

a key connected to one of two pulleys, over which passes an endless cord attached to the chamber. This arrangement is placed within a larger box, the ends of which have apertures through which light is admitted from two powerful petroleum lamps. Corresponding exactly with these apertures, similar apertures are bored into the sides of the small chamber, which admit the light to either side of the Bunsen disc. The dimensions we have adopted are, for the larger box, 12 in. long, 6 in. high, and 4 in. deep. The small chamber is a cube measuring 2 in. insied. We find it neeessary to blaeken everything within the box except the seales, and it is also important to exelude all extraneous light by means of a sereen. The heat of the lamps, also, very soon injures the woodwork unless it is covered with asbestos eardboard and sheet metal.

The aperture on the left-hand end of the large box we reduce to about ¼-inch diameter by a diaphragm. At this end is placed the plate to be measured, held in position by springs. The hole at the right-hand end of the box is redueed by a reetangular diaphragm, ¼-inch wide and ½-inch long, the length being vertieal. This diaphragm can be reduced in length by moving a taper diaphragm past it.

The instrument is provided with two scales, one fixed, the other movable, the use and construction of which we will now explain. The fixed scale indicates the position of the disc ehamber, and is constructed as follows:—

Suppose that the lamp on the left-hand side gives light of the intensity T_1, and that on the right-hand side light of intensity T_2, and that both lamps are equidistant from the centre of the instrument, and that this distanee is l.

Then, when the dise ehamber has been moved to a distanee x from the centre of the instrument, so that—

$$(1) \qquad \frac{T_1}{(l-x)^2} = \frac{T_2}{(l+x)^2} \text{ or } \frac{T_1}{T_2} = \left(\frac{l-x}{l+x}\right)^2$$

the two images of the dise will be alike. If a plate is now inserted which reduces the light from the intensity T_1 to intensity i, then the dise ehamber will have to be moved to another plaee nearer to the plate before the two images of the dise are alike again. Supposing the distance of the dise from the centre of the instrument is now y, then—

$$(2) \qquad \frac{i}{(l-y)^2} = \frac{T_2}{(l+y)^2} \text{ or } \frac{T_2}{i} = \frac{(l+y)^2}{(l-y)^2}.$$

By multiplying the two equations we find the fraction which measures the opacity—

$$\frac{T_1}{i} = \left(\frac{l-x}{l+x}\right)^2 \left(\frac{l+y}{l-y}\right)^2.$$

Taking logarithms on both sides, we have, since log. $\frac{T_1}{i}$ is the density D of the plate,

$$D = \log. \left(\frac{l+y}{l-y}\right)^2 - \log. \left(\frac{l+x}{l-x}\right)^2.$$

If, therefore, at the distanees x and y we write on the scale the values of log. $\left(\frac{l+x}{l-x}\right)^2$ and log. $\left(\frac{l+y}{l-y}\right)^2$, we can simply read off these logarithms, subtract one from the other, and the result is the density of the plate. For general convenienee, we use vulgar and not hyperbolie logarithms. In order to avoid all errors arising from the distance of the lamps, we make the apertures in the box small compared with the luminous portion of the flame of the lamps; it can be shown that in that case the distanee l must be measured between the centre of the instrument and the diaphragm.

The following table gives the relative distances of the various points of the scale from the centre of the instrument, at which the logarithms of $\left(\frac{l+x}{l-x}\right)^2$ have the values 0·1, 0·2, 0·3, &c., l being half the distance between the diaphragms.

Table I.—Fixed Scale of Instrument.

Log. $\left(\frac{l+x}{l-x}\right)^2$	Distance from Centre of Instrument.	Log. $\left(\frac{l+x}{l-x}\right)^2$	Distance from Centre of Instrument.
0·000	$l \times 0{\cdot}000$	0·900	$l \times 0{\cdot}476$
0·100	$l \times 0{\cdot}057$	1·000	$l \times 0{\cdot}519$
0·200	$l \times 0{\cdot}111$	1·100	$l \times 0{\cdot}560$
0·300	$l \times 0{\cdot}171$	1·200	$l \times 0{\cdot}599$
0·400	$l \times 0{\cdot}226$	1·300	$l \times 0{\cdot}634$
0·500	$l \times 0{\cdot}280$	1·400	$l \times 0{\cdot}667$
0·600	$l \times 0{\cdot}332$	1·500	$l \times 0{\cdot}698$
0·700	$l \times 0{\cdot}382$	1·600	$l \times 0{\cdot}726$
0·800	$l \times 0{\cdot}430$	1·700	$l \times 0{\cdot}752$

Suppose, as in our ease, the box were 12 in. long between the diaphragms, then l is 6 in. The eentre of the instrument is marked with zero, and we find from the table that 0·500 must be plaeed at $6 \times 0{\cdot}280$ in. from the centre on both sides of the eentre. Similarly, other points of the scale are found by means of the table. The scale on both sides of zero is symmetrical. The distances between the points so found are subdivided into equal parts. This is not absolutely neeessary, but it is convenient.

The movable seale (see Fig. 3) is attaehed to the upper edge of the taper diaphragm, which is used for reducing the amount of light admitted through the reetangular opening. This taper diaphragm is made of sheet metal about 12 in. long and 2 in. wide, out of which is eut a triangular opening about 10½ in. in length from base to apex, the width of the base being ½ in. It is essential that the sides of this triangle be absolutely straight lines. The scale attached to this taper diaphragm is constructed as follows: From the apex we measure 10 ins. exactly towards the base; this gives the zero point of the scale. The other points of the scale are marked so as to read directly the densities. At any distance x from the apex the area of the opening, and with it the intensity of the light, will be reduced as 10 : x, and the vulgar logarithm of the fraction $\frac{10}{x}$ is the corresponding density with whieh the seale is marked. For convenienee we append table showing the distances from the apex at which the figures 0·1, 0·2, 0·3, &e., are to be placed:—

Table II.—Movable Scale.

Value of Log. $\frac{10}{x}$.	Distance from Apex.	Value of Log. $\frac{10}{x}$.	Distance from Apex.
	Inches.		Inches.
·00	10	0·50	3·16
·05	8·91	0·60	2·51
·10	7·94	0·70	2·00
·20	6·31	0·80	1·58
·30	5·01	0·90	1·28
·40	4·00	1·00	1·00

Intermediate points are obtained by subdivision into equal parts.

An index is fixed to the inside of the box over the centre of the rectangular diaphragm, pointing to the num-

ber to be read. The figures 1 and 2 will help to make this description clearer.

Two examples will show how the instrument is used.

1. When measuring a small density we move the sliding scale to zero, and the disc chamber to such a position that the images of the Bunsen disc are alike. We then insert the plate to be measured, and, without altering the position of the disc chamber, slide the movable scale until equality is restored. The density will then be indicated by the fixed index on the diaphragm scale.

2. In the case of a high density we place the sliding scale to 0, and by placing a piece of opal glass outside the box, between it and the lamp, we reduce the light on the right-hand side until the disc chamber requires to be moved almost up to the right-hand end of the box in order to secure equality of the images. If necessary, we move the lamp further away. When equality is thus secured, we read the number below the index of the disc chamber on the fixed scale. We then insert the plate to be measured, and move the disc chamber to the left until equality is again restored. If that cannot be done by the movement of the disc chamber alone, it can be obtained by using the movable scale in addition.

Suppose the index stood at 1·100 on the right, and afterwards at 1·55 on the left of zero, then the density would be $1{\cdot}100 + 1{\cdot}55 = 2{\cdot}65$.

If the index stood at 1·10 to the right and afterwards at 1·7 to the left, and equality could then only be restored by using the movable scale as well, and its index pointed to ·75, then the density would be $1{\cdot}10 + 1{\cdot}7 + 0{\cdot}75 = 3{\cdot}55$. Higher numbers than 3·55 do not occur in ordinary negatives. A plate, the density of which is 3·55, only transmits $_3{}^1{}_{4\,5}$th part of the light it receives.

The general rule for finding the density is: Consider the numbers to the right of zero as negative numbers, those to the left as positive. Subtract the first reading from the second; the result is the density. If the movable scale be used as well, the amount it indicates must be added.

With this instrument we have obtained fairly accurate results. Analyses of mixtures of Indian ink and water, indigo solution and water, and of many other substances have been made by it. The following analyses are given to show the capabilities of the instrument:—

1. Experiment with Indian ink.—An Indian ink solution was mixed with water in known proportions, and the density of one solution being known, that of the others was calculated. The following table shows the observed and calculated densities. The calculated density is simply proportioual to the amount of Indian ink employed

Table III.—Experiment with Indian Ink.

Indian Ink employed to 100 c.c. of Water.	Density calculated.	Density found.	c.c. of Indian Ink found.
c.c.			
5	·240	·240	5·00
10	·480	·500	10·42
15	·720	·750	15·62
20	·960	·950	19·80
25	1·200	1·245	25·90
30	1·440	1·440	30·0
35	1·680	1·665	34·7
40	1·920	1·885	39·3

The greatest error made does not reach 4 per cent. of the total amount, and even better results can be obtained if more than one reading be taken. But this accuracy is quite sufficient for photographic purposes, where, from other causes, still greater errors are liable to arise, as will presently be shown.

Sometimes, when using the instrument for analysing solutions of coloured salts, a peculiar difficulty arises from the different colours of the two images of the Bunsen disc. This is easily overcome by viewing the disc through appropriately coloured glass, red, green, and blue glasses being the most useful. The following experiment with indigo solution is representative of one of the most difficult, since dark blue glass was used to view the disc.

Table IV.—Indigo Solution.

Indigo Solution Employed.	Indigo found.	Density calculated.	Density found.
c.c.	c.c.		
100	96·0	1·554	1·487
50	50·6	·777	·787
25	24·1	·388	·375
10	10·0	·155	·155

It will be seen again that the results are only accurate within five per cent. of their value.

With regard to the lamps, they should be powerful petroleum lamps with duplex burners. The flames should be in planes at right angles to the axis of the instrument. Very erroneous results are obtained if Argand burners are used. The lamps should be placed close to the diaphragms, and it is advisable to provide a small stage outside the diaphragm, to hold coloured glasses when a substance requires investigation in light of a particular colour. Captain Abney has also devised an instrument for measuring transparencies. His instrument consists of a Rumford shadow photometer as indicator, and of a revolving sector, which can be closed or opened whilst revolving, as a measure of the transparency. Apart from the fact that a Bunsen disc is more sensitive than the shadows, there is a fallacy in the assumption that the amount of light which passes through a revolving sector is proportional to the angle to which the sector is opened. Experiments made for the purpose show that the amount of light passing through a revolving sector is more correctly represented by a formula—

$$T_x = T\,\frac{\phi}{360} + C,$$

where T_x is the light transmitted by the sector, T the intensity falling upon the sector, ϕ the angle of opening, and C a constant, which depends upon the relative position of the lamp, the sector, and the screen, and is, in fact, due to the semi-shadow on both edges of the sector openings. The error caused by this constant is small with plates of low density, but it rises to over 100 per cent. with plates of high densities, which renders the results utterly untrustworthy.

We have thought it necessary to give this lengthy description of our instrument, since we consider it a very important one; it is for photographic experiments as indispensable as the balance is in analysis. The instrument is capable of other applications; its indications can always be translated into weights by simply multiplying them with a factor. It is, therefore, capable of applications in analysis.

(*To be continued.*)

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The following is the list of awards in the Photographic department:—

Professional.—1st Silver Medal—L. Sawyer, R. H. Lord, W. W. Winter; 2nd Silver—W. J. Byrne; 1st Bronze—T. Protheroe, T. G. Whaite, H. W. Reeves, R. Keene, T. Whalley, R. W. Robinson.

Amateur.—1st Bronze Medal—W. W. Fry, A. G. Tagliferro, Rev. H. B. Hare, A. K. Dresser, J. W. Charlesworth, H. D. Arnott.

Honourable Mention—R. W. Robinson, York and Sons; S. W. Bhedwar.

RULES OF LIGHTING.

BY H. EDWARDS FICKEN.

Hard and fast rules, formulated but from one point of view, will inevitably produce hard and fast effects; nor will isolated passages from the writings of the old masters, bearing but upon the production of *certain* effects in *certain* directions, prove anything else.

In the review of "The Lighting in Photographic Studios," given in a recent number of the *Photographic Times* (No. 448, p. 184), occurs the following paragraph, taken from the first chapter of the book: "The illumination of the face being the main object in portraiture, every other light should be subordinate to it, and no light should surpass or equal it in brightness."

There is not an artist who would not, on purely artistic grounds, take strong exception to this hard and fast statement set down as a rule. It is simply mischievous, and altogether bad and misleading. There is not an artist who has ever painted a portrait who would not laugh at it. The reference to artists is only made as the chapter quoted, and from which the above paragraph is taken, constantly refers to artists and their work.

All artists hold the colour of the flesh as a distinct tone—distinctly lower than the greatest lights in their paintings. A knowledge of the works of our best modern portrait painters—and modern work is only suggested as the more accessible for study—will prove this without question.

Take Alma Tadema, Herkomer, Sargent, Chase, Beckwith, and others as well known, and you will find their backgrounds, their accessories, their details of costume, painted in higher and more brilliant tones than the flesh, and their work is the work of master hands, and founded upon the truest insight into nature, and the truest study of art.

The face is never the highest light in nature, and to portray it so in photography is to portray a photographic untruth. It is the restless striving to produce too much lighting, too much shading, too much modelling, that mars the usual photograph of the face, and irritates the artistic judgment.

No better illustration of the highest results artistically to be obtained in photographic portraiture could be given, in its combination of the brush and the camera, than two photographs taken some two or three years ago by Mr. Kurtz from the original paintings—one of a young Vanderbilt, painted by Cabanel, and the other by Mr. Walters, of Baltimore, painted by Bonnat. The paintings were masterpieces, and the photographs of them, taken on orthochromatic plates, were photographic masterpieces, the schemes of colour being perfectly preserved. Each photograph seemed to be from life—in this lies the moral—and no better tribute could be paid the painter.

In the case of the young Vanderbilt, the background and the accessories—the costume was that of a young cavalier—were all in a *lighter* key than the flesh tones. In Mr. Walters' portrait the dress was the modern frock-coat, but the colour showing above and the cuffs over the wrists were *white*, the flesh tones being quite intermediate.

There was but little attempt at "modelling" in the face of the boy, yet it was full of expression. In the man's portrait the face was full of deep shadow, and the white hair and shaggy eyebrows quite subordinate to other and higher lights.

Both pictures—and the photographs alone are referred to—were notable in all ways, and especially for study and example—for the study and example that will do more a thousand times for the student than hard and fast rules that are as jingling emptinesses in the presence of nature.

If photography seeks to follow in the footsteps of art, it should free itself from the limitations of lighting in portraiture imposed by the narrow confines of skylights and reflecting screens. Were more study given to simplicity in lighting, the more successful would be the average portrait. This is exactly the study of the painter—*simplicity* in his methods.

Why does the amateur often beat the professional? Because he is backed with more artistic judgment, and, freed from the conventions of the skylight, works with the greater simplicity. What has made the artistic success of the Messrs. Cox? Nothing but this. What has led Sarony nowadays to discard backgrounds and bric-a-brac altogether?

Mr. Duchochois quotes Da Vinci in relation to light and shade: but what value has the reference in the light of modern methods, and the wider, sounder, and better equipped knowledge of art to-day? Every picture gallery, every collection of connoiseurs, contains masterpieces of genre painting without a single cast shadow. The very narrowness of education, of vision, of surroundings of the old masters, effected by the confines of their times, produced their hard and fast effects under the hard and fast rules of circumscribed and purely conventional schools. Some did rise above their fellows and their time in occasional greater freedom from conventional method, and these to-day remain cherished—cherished as "old masters," but no longer held up to the student for more than study of generally what to avoid.

The student of to-day must study the modern master, working in his greater knowledge of perspective and the laws of atmospheric condition governing it, as he works with his brighter palette, with its modern extended range of colour, working in his greater insight of nature's moods and harmonies in his drawing upon nature itself for his inspiration.—*Photographic Times.*

The *Wiener Allgemeine Zeitung* (weekly), of which several sample copies are forwarded, has opened a photographic column. Several articles on "Amateur Photography" have appeared over the signature "E.K.," followed in some cases by answers to correspondents and brief notices of books.

Our Egg Supply.—In a return which has been published, it is stated that our egg imports increased from 123 millions in 1853 to 757 millions in 1881. The imports were 1,090,089,240 eggs, valued at £3,085,681, in 1887; 1,126,792,680 eggs, worth £3,083,167, in 1888; and 1,129,796,680 eggs, valued at £3,122,813, in 1889.

Patent Intelligence.

Applications for Letters Patent.

13,031. F. FICHTELBERGER, 142, Fleet Street, London. "Phosphorescent Signs for Tradesmen."—August 19th.

13,054. G. A. SINSEL, 70, Market Street, Manchester. "Magnesium Lightning Lamps."—August 20th.

13,055. L. A. FRANKS, 4, St. Ann's Square, Manchester, "Cameras."—August 20th.

13,066. S. J. STREET, 11, Gt. Coram Street, London, "Optical Illusions."—August 20th.

13,191. G. W. WOOD, 3, St. Nicholas Buildings, Newcastle-on-Tyne. "Improvements in the Photographic 'Dusting-on' Process."—August 22nd.

13,205. M. A. WIER, 9, Strand, London. "Brake for Photographic Shutters."—August 22nd.

13,262. J. C. OSBORNE, 402, Mare Street, Hackney, London. "Removal of the Action of Light on Untoned Sensitised Papers and Surfaces."—August 23rd.

13,283. J. B. FENBY, Sutton Coldfield, Warwick, "Instrument for Producing Caricatures of Drawings."—August 23rd.

13,304. E. A. WIER, 115, Cannon Street, London, "Cameras."—August 23rd.

Specifications Published.

15,451. *October 2nd*, 1889.—"Preventing Second Exposures." GEORGE RENWICK, 20, Station Street, Burton-on-Trent, Staffordshire, Photographer.

This invention consists of the herein described improvements in connection with photographic dark slides, by which the operator can tell whether the plate has been exposed or not, and which will prevent the dark slide shutter being accidentally withdrawn to expose the plate a second time.

For the purposes of my invention, I provide a lever-catch which is pivoted near one end to a base plate fixed to the dark slide frame near the open end of the rabbet in which the shutter fits. A suitable spring acts upon this lever-catch, and forces its free end towards the shutter, so that it will engage with a projection on the shutter, and thus lock the shutter in its closed position. This projection may be the end of the tongue on the shutter which fits in the rabbet. Fixed to the shutter adjacent to the free end of the lever-catch is a peg or hook, and on the said lever-catch, and preferably at or near the free end thereof, is a projection corresponding with the said pin or hook.

The parts above described operate as follows: When an unexposed plate is in the dark slide frame the operator, just before closing the shutter, pushes the lever-catch sideways, so that when the slide is pushed home, the pin or hook on the shutter will come into contact with the said projection on the lever, and prevent the lever engaging with the shutter, thus leaving the shutter free to be withdrawn to expose the plate. On withdrawing the shutter to expose the plate, the said pin, or hook, on the shutter, being withdrawn from the projection on the lever, allows the lever to spring against the shutter, so that when the plate has been exposed, and the shutter again pushed home, the said projection on the lever will be free of the pin or hook on the shutter, and the lever-catch will engage with and lock the shutter. As the shutter cannot be withdrawn without the operator first pushing the lever-catch sideways to unlock it from the shutter, the operator knows that the plate has been exposed, and its accidental exposure a second time is thus prevented.

15,530. *October 3rd*, 1889.—"Camera Stands." ROBERT WILLIAM BOYD, Fairbank, Caterham, Surrey, Merchant; HENRY SUTTON NOBLETT, Ashton Place, Cork, Ireland, Gentleman; FRANK THOMAS CANTLE, 4, Shepherd's Bush Road, Shepherd's Bush, London, Electrician.

Our invention relates to the portable class of camera stands, and is constructed so that while having the advantages of the ordinary stand, it can be closed up into the form of a walking-stick, or staff, and is fitted with special arrangements for facilitating the movement of the camera, also for keeping the stand rigid, and for raising or lowering; and to carry out our invention, we make the legs of the staud preferably of a shape so that in section they would (if three legs are used) be each one-third of a circle, or (if four legs are used) one-fourth of a circle, so that when closed they appear as one stick; the bottom ends of these legs are provided with spikes to prevent slipping when in use; on the upper part of the fitting of these spikes is a part of a screw thread, which forms a complete thread when the three, or four, are closed together, and a ferrule is provided to screw over the spikes on to this screw, which protects them, and also keeps the lower ends together when the stand is being carried: a bayonet or other suitable joint may be used in place of this screw. The upper part of each leg is hinged to a top fitting which carries a screw socket into which a ball is fitted, which ball has a screw projection to screw into a plate, or other fitting, on the bottom of the camera; the screw socket is made for this ball to fit into loosely and screw down over the ball to fix it in any desired position, thus forming an ordinary ball-and-socket joint.

The periphery of the top fitting is provided with a screw, and a hollow knob is provided to fit over the ball-and-socket joint, and screw to this screw, thus forming, when closed, and with bottom ferrule attached, a walking-stick; or, instead of a knob, a crooked or other suitable shaped handle may be used to screw on in a similar manner, or a bayonet joint may be used instead of a screw. This stand may be made the length of an ordinary walking-stick, or, if desired longer, can be made of any suitable length and form a staff. If the stand is required to be adjustable in height, we construct the legs so that when closed there is a hollow space down the centre, and in this centre space we fit a tube connected to the top fitting; in this case the ball-and-socket is attached to a rod which is made to slide down through the top fitting into this centre tube, and this rod may be raised to any desired height and fixed in position by a set screw or other suitable means.

To make the stand more rigid we attach ribs to the inner side of each of the legs, and these ribs are fastened to a collar running on the central tube; one or more of these sets of ribs may be used; preferably two sets are used, one set at or near the bottom to keep the legs extended, and one set at or near the centre, made somewhat shorter than the actual distance between the centre tube and the legs, so that they will spring the legs slightly in, and thus prevent all vibration. Various modifications may be made, and any suitable materials may be used, always preserving the essential features of our invention, which are a portable camera stand, made and fitted with the supplementary parts, as herein described.

3,736. *March 10th*, 1890.—"Stand for Use in Enlarging." JAMES CHAPMAN SHENSTONE, 13, High Street, Colchester, Essex, Chemist and Druggist.

The material used from preference is white pine wood. It consists of a rectangular platform on which to stand the lamp, the height of which can be made such as to bring the lamp to a convenient height, and with a base for a camera adjusted to the front and on the top of and square with the platform, by studs or suitable screws. This base can be made of such a size and height to bring the camera into a convenient position. A horizontal slot in front and back of the platform receives a flat rod of wood of sufficient length gauged to move steadily through the slots of the platform, and always parallel to the axis of the camera. At the distance end of the rod is fixed a bracket to hold a board or picture at right angles to the rod, and parallel to the end of the camera base and platform.

This bracket may be hinged, so that it can be laid flat upon the rod for convenience in putting away when not in use, and can readily be raised and fixed into its proper position by a thumbscrew at the back. The top surface of the rod has a shallow slot along its centre, in which is a scale in feet, and inches, and centimetres, whereby to note the focal distance for facility and accuracy in taking duplicate copies or enlargements.

THE Berlin *Photo-Nachrichten* grows enthusiastic over a beautiful zinc etching by Mr. Kurtz, recently published. It says: "It shows a wonderful clearness and fineness of light, and has an entirely individual quality. This is the process of the future for illustration."

Correspondence.

HACKNEY PHOTOGRAPHIC SOCIETY.

Sir,—Below is our programme for September, 1890:—6th—Excursion to Broxbourne (train leaves Liverpool Street at 2.15); 11th—"'Silver' and 'Obernetter' Toning," Messrs. H. J. Beasley and A. Barker; 25th—"Shutters," Mr. W. L. Barker.

The Council has decided to withdraw Class F, and the Championship award will be made to the best picture in the Exhibition, without any special fee or classification.

W. Fenton Jones, *Hon. Sec.*

12, *King Edward Road, Hackney, London, N.E.*

THE CAMERA CLUB AND TRADING IN PHOTOGRAPHY.

Sir,—Having only just returned from a short visit to the Continent, it was but to-day that I read the last two numbers of the Photographic News. In each number there is an "editorial" criticising an action of the Camera Club. As mine is the firm referred to, it may make matters a little clearer if you will allow me to state the following.

About eighteen months ago, hearing that the Club was to have new premises with a shop on the ground floor, I wrote to Mr. George Davison, asking him for the first refusal of the lease of the shop, as I thought about taking a West-End branch. Our business has now grown so rapidly and extensively, that we find additional premises necessary, and even imperative. We are taking them on a seven, fourteen, or twenty-one years' lease, the seven to be terminable at our option only, and not that of the Club.

As to your remark about rent, it probably may be excessive, but that is, of course, a matter entirely for our own consideration. There is no occasion for us to be in any way dissatisfied with the treatment of the Camera Club, and we neither ask for nor expect trade at their hands merely because we are their tenants, but fully hope that by catering in our usual prompt and general business-like manner, to deserve not only the patronage of the Club's members, but of the photographic public generally.

Pro Adams & Co.

81, *Aldersgate Street, London, E.C.* Arthur L. Adams.

SPHERICAL ABERRATION AND TREATMENT OF SUBJECTS BY FOCUS.

Sir,—I did not ask Mr. Debenham to criticise my style of writing. Mr. Burton and I correspond privately, and if we disagree on any subject, we agree to be perfectly free to use expressions which we consider honest. Mr. Burton has *said* that I have been wrong, and I have *proved* him to be wrong.

As Mr. Debenham does not *yet* seem to understand this subject, I will ask you, Sir, to allow me to reproduce the diagram by Grubb that you have reproduced before, and another one which I shall furnish you with, *correctly disposed*, in order that, placing the two together, I may repeat distinctly and concisely the advantages that exist by the introduction of spherical aberration as regards improvement in out-of-focus planes.

Th. R. Dallmeyer.

25, *Newman Street, London, W., 26th August*, 1890.

The Photographic Club.—Subject for discussion on Wednesday, September 3rd, "Supplementary Exposure;" September 10th, "On Modifying Lenses."

Chained Up.—A photographic newspaper printed in Coventry, a few days ago said about our criticisms on the wisdom of having a photographic shop on the Camera Club premises:—"The Photographic News has found a mare's nest, and built up a couple of two-column articles upon it." As the said journal publicly parades the names of leading members of the Camera Club every week as its chief writers, it is unlikely to give offence to its chief patrons by ever criticising the Camera Club adversely, and may be assumed to object to any free discussion as to whether anything is strongly under the thumbs of members of the Club.

Proceedings of Societies.

Photographic Society of Great Britain.

At the technical meeting of this Society held on Tuesday evening last, the 26th inst., Mr. W. England occupied the chair.

A set of photographs of microscopic sections of marl-stone and of chalk-bearing foraminifera was shown by Mr. T. E. Freshwater. He had preferred to use a low power on account of the field then being flatter, and obtained size by a long extension of the camera. The magnification was about 250 diameters.

Some prints sent by Mr. O. Schölzig to illustrate the advantage of printing through green glass were submitted to the meeting, and a letter accompanying them was read by the Chairman. In the letter it was stated that prints made in this manner readily toned to a good black colour, and that thus they were a perfect substitute for the expensive and troublesome platinum process.

Mr. W. E. Debenham said these prints might and did resemble platinum prints in colour, and so might matt-surface prints without green glass, but that to be a perfect substitute for platinum they should be equally permanent. The effect of printing under green glass he had found was to cause toning to take place much more quickly, and thus black prints were easily obtained. It also lessened the contrasts, and so was useful for printing such negatives as, in the ordinary way, were so dense as to lose in printing the details in the high lights and deep shadows. With negatives wanting in contrast it had consequently proved injurious. As ready-sensitised paper was generally more difficult to tone than that prepared at home, the facility of getting a black tone when using green glass was an advantage of more consequence than with home-sensitised paper.

Mr. Scamell had found that the ready-sensitised paper did not tone with at all the same facility as that prepared at home.

A print on gelatino-chloride paper sent by a Dutch firm was submitted to the members.

A number of views of the cyclists' camp, and some taken at a recent photographic outing, were shown by Mr. Chang.

It was announced that the next technical meeting of the Society would be held on the 30th of September, the fifth Tuesday of the month instead of the fourth Tuesday, as is customary.

London and Provincial Photographic Association.

August 21st.—Mr. A. Haddon in the chair.

A question was asked if any advantage was gained by using an old toning bath in preference to a new one?

Mr. W. E. Debenham said that he always used an old bath; he believed it worked better.

Several members thought that an old toning bath had no advantage whatever, and that after a time its composition could only be a matter of speculation.

The subject for discussion was "Cloud Negatives." This was opened by Mr. J. S. Teape, who said that he used slow landscape plates, the lens being well stopped down. In developing, he recommended using a full proportion of bromide and very little alkali. Clouds could be printed artificially by applying colour to the back of a thin, or reducing parts of the sky of a dense, negative, or holding the negative over the smoke from a lamp. Mr. Teape exhibited a variety of prints and negatives of clouds.

Mr. T. E. Freshwater found a difficulty in getting sufficient contrast between a blue sky and white clouds.

The Chairman suggested reflecting the clouds at an angle on a piece of plain glass.

The Hon. Secretary said that excellent results in cloud pictures could be obtained with isochromatic plates; he had used these plates with very great advantage.

Mr. Atkins thought that Nicol's prism might be found useful in photographing clouds.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE last half-day excursion took place on Saturday last to Lichfield, under the leadership of Mr. A. J. Leeson. The light of the afternoon was excellent for photography, and considerably over one hundred negatives were taken by the party, which was the largest this season. The cathedral—interior and exterior—made some charming architectural pictures, while St. Chad's church, and some old picturesque cottages near the reservoirs, together with a very fine rainbow, which about a dozen members attempted to take, gave sufficient employment till the shades of night came on.

THE BATH PHOTOGRAPHIC SOCIETY.

LAST Thursday's outing of the members was well attended, notwithstanding the threatening aspect of the sky. The excursion party left the city in a brake, taking the Wells Road, through picturesque Midford, to Norton St. Philip. Upon arrival at Norton nearly a score of cameras was quickly ranged in line for views of the quaint "Old George Inn," an ancient hostelry said to have sheltered Charles one night and Cromwell the next when on the war path. Having visited the church and exposed plates on the village surroundings, a start was made for Bradford-on-Avon, a cloth manufacturing town of some 7,000 inhabitants. Farleigh Castle was passed upon the road. The "Swan Hotel," Bradford, was reached in due course, and a move at once made for the Duke's or Kingston House, a splendid mansion erected in the 17th century for the Duke of Kingston. Mr. Fred Shum, F.S.A., in a paper read before the Archæological Society, describes the style of the buildings as transitional, between the old Tudor and Palladian. The front, facing south, is divided into two stories, with atties in the gables. The windows are in beautiful proportion with the stone mullions, and at first sight appear to cover the whole front. The present owner received the party, and gave every facility to photograph within and without his premises.

At Belcombe Brook the party and some other subjects were photographed; but owing to the approaching twilight no work was attempted within these picturesque grounds.

WHY A SITTER COULDN'T LOOK PLEASANT.—"A man trips over his own cleverness now and then," said Max Platz in the *Chicago Mail*. "You know that when people are sitting for pictures they are given an object to keep their eyes fixed on, don't you; that this object is usually a photograph fixed in a clasp at the top of a stick, which may be raised or lowered to suit the case. Usually there are two photographs back to back—one the picture of a gentleman and the other the likeness of a lady; if the sitter is a gentleman he is given the *charmante dame* to rest his eyes on; if a lady, the gentleman's photograph is turned to meet her gaze. The other day a charming young society lady was sitting for a picture. I had her all posed and told her to look at the object indicated and look pleasant; she complied by looking savage enough to fight a dog. I didn't say anything. Its no use, you know. Besides, the plate was spoiled; so I slipped in another and gave her a slightly different attitude, and ventured a bit of time-tried and fire-tested wit in order to make her look sweet as I called her attention to the object picture and pulled the string. Same as before—a scowl that nearly broke the plate. Once more, and a funny story thrown in. No good. Still another, with a neat bit of flattery at the critical moment. Worse and worse! Four plates spoiled. Finally I said: 'Had a death in the family?' 'No,' she said. 'Lost a pet dog?' 'No.' 'Had a quarrel with anybody?' 'No.' 'Well, then, please look pleasant,' and I drew her gaze to the aforesaid picture. 'Must I look at that?' she asked. I told her she must. 'And look pleasant?' she enquired. 'Yes,' I said. 'I can't,' she remarked quietly but firmly. I looked at the photograph to which I had been directing her gaze. It was a picture of myself. The joke was on me."

W. D.—The matter you write about in *ex parte* form is more within the functions of the law or police to take up than it is within the functions of a newspaper, especially as we know neither of the parties to the case.

Answers to Correspondents.

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

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

FERRIC OXIDE.—*Photography in Natural Colours.* There is literally nothing new since the Editor reviewed the present state of our knowledge on this subject in an article of fourteen pages in the YEAR-BOOK.

ARISTOTYPE.—*Difficulty in Toning.* We share your opinion, having lately been troubled in the same way. One sample of gelatino-chloride paper refused to tone either in the borax and gold, sulphocyanide, or compound hypo bath. Although Dr. Liesegang's name is marked on the packet, there is no guarantee that it was actually made by him. The finished prints were all of a foxy yellow tint, and nothing would change them to a more agreeable colour. The film is always tender, and becomes especially so after long soaking.

W. L. B.—*Isochromatic Plates.* It is hardly worth while attempting to prepare them for yourself, for the colouring matter, whether azaline or erythrosine, ought to be put into the emulsion. Mr. Pringle has, however, succeeded by bathing the plates, and all authorities agree in advocating the very sparing use of colour, so as not to injure the sensitiveness.

X. Y. Z.—*Ruling Prices.* We can hardly advise you on this point, so much depending on the locality and other circumstances. Offer a good thing, and the public will pay for it. Remember, it is easier to reduce than to raise your scale of prices.

S. P.—*Collotype.* Dr. Gunther sends the following information:—1. "Thick *gelatine*" (page 608, line 28 from bottom) is misprinted; it should be printed "thick *glycerine*." 2. By the "*short damping process*" is understood the treatment of the printing plate with the etching fluid *just before fixing it to the press.* After printing under the negative in the printing frame the plate is, of course, *thoroughly* washed in the usual manner to remove the excess of bichromate. The method of damping or etching described on page 608 serves more especially in cases where a collotype plate has to be prepared from a rather *over-exposed* and *dense* negative, where the impression would turn out too hard in printing if the plate were damped sufficiently. In the case of a normal negative the plate may be damped for half-an-hour.

C. N. W.—*Travellers' Damage.* One of the railway companies may be responsible; but there will be a difficulty in proving your case when two lines have been traversed, and a short sea-trip forms part of the journey.

L. T.—*Instantaneous Shutter.* Choose the first-named, for it is actuated by a steel spring, which is less likely to get out of order than the elastic band arrangement of constantly varying tension used in the latter.

F. C. S.—*Nickel as an Illuminant.* One of the most astounding discoveries in modern chemical science has just been announced by Messrs. Mond, Langer, and Quincke. It is the formation of a *volatile* compound of nickel with carbon monoxide, $Ni(CO)_4$, the vapour of which burns with a "highly luminous flame," that may some day find application as a photographic illuminant. A porous quality of metallic nickel is first prepared by passing hydrogen over oxide of nickel heated to 400° C.; a slow current of carbonic oxide gas, CO, is then substituted for the hydrogen, and when the temperature cools to about 100° C., or lower, the new body is formed, and passes forward diffused in the excess of the before-mentioned gas, communicating to it the property of burning at a Bunsen jet with great brilliancy. Such a flame, being free from the disadvantages of the chloroehromic light in regard to the absence of acid fumes, may be expected to lend itself to many practical applications, and, amongst them, to serve the purpose already indicated. It likewise reduces an ammoniacal solution of chloride of silver to the metallic state. For further details, see the current number of the *Chemical News.*

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

IN THE SUN'S EYE.

MOST of the photographic instruction books—and they are happily numerous—in giving the tyro directions by which he can select the best point of view for his first attempts, strenuously urge him to so place his camera that the sun is either at one side or behind the instrument; and they are certainly right, for were the beginner to face Father Sol he would speedily get launched into all kinds of difficulties, from which he would not know how to deliver himself. But with the practised hand it is different, and some of the most beautiful natural effects can be secured by the man who is bold enough to aim his lens "in the sun's eye." This phrase is allowable, we think; and in the same sense in which a mariner speaks of "the wind's eye," we may write of the sun. Anyway, we mean by the term pointing the camera more or less directly towards the sun, so that shadows are cast toward the camera.

Some of the old workers were certainly fond of this method of treating a view. One we may name in particular, whose pictures made a very great sensation some forty years ago. They were mostly seascapes, and consisted chiefly of broad effects of light and shade, and were the nearest approach to instantaneous work before the days of gelatine. A few of these photographs by Breeze are still extant, and they represent good work, considering the difficulties inherent to the old processes. They are, besides, excellent examples of cleverly combined negatives, some of the views being due to patient building up of three or four pictures. Another worker who delighted in looking into the sun's eye was Colonel Stuart Wortley, who produced some excellent seascapes of large size, and who generally, after the manner of Breeze, secured an effect of sunlit ripples and illuminated sky, which were wonderfully effective.

It is, indeed, impossible to secure certain effects unless the camera is placed so that its lens points towards the sun, and there is no reason why this position should not be adopted if sufficient precautions are taken to prevent the sun's rays actually entering the hood of the lens. Old stagers know well how to secure this end, and will carry with them a short funnel lined with black velvet, or a piece of card to project above the camera, which, with the focussing cloth adjusted round it to make a kind of hood, answers every purpose. As a makeshift, the hat is sometimes used as a lens shade, but here there is always a risk of part of the obstruction intruding into the picture, for at the supreme moment of timing the exposure one is apt to let the hat down a little too low, and the picture is probably spoilt.

Taking the precaution named, pictures may be taken in the direction of the sun without any great difficulty, and sometimes with very great advantage. Of marine pictures this is especially true, for it is obvious that those lovely reflections which sparkle in the sea like diamonds cannot be reproduced under any other conditions. The same remark is true of the lovely line of light that touches every ripple as its curve is bent towards the sky. But it is, perhaps, in broad effects of sea and sky that the advantage of aiming towards the sun becomes most apparent. Suppose, for instance, that one is standing upon the Admiralty Pier at Dover, a position from which the grandest effects are obtainable. It is afternoon, and the sun is sinking towards Shakespeare's Cliff, and rendering every wave, as it dashes towards the pier, semi-transparent. There is a sky which is just cloudy enough to cast lights and shadows alternately upon the sea, and we take advantage of a temporary eclipse of the sun by one of these clouds to focus a general view of cliff and sky. There is a steamer at anchor about half a mile away, and one or two black buoys which usefully break the surface of the water. The wind is bringing the clouds directly towards the camera, and they seem one after the other to lift themselves up above the sun like so many curtains, to let its light flood the sea below. Such a flood of light is now creeping towards us, and is gradually changing the waves into molten silver. The light has crept to the big cliff, and is slowly approaching us. Now it has got as far as the steamer; in another

moment it will be at the pier; but before it has time to come upon us, we squeeze the pneumatic ball, and the picture is taken. And then comes the sun over everything, lighting up pier and shipping with its genial rays. An amateur photographer passes, and, glancing at our camera, from which we are removing the dark slide, gives a contemptuous laugh, and says to his friend, "No good taking a view in that blaze of light." But the picture which we secured was a gem, after all, for it secured a lovely effect, and one which may not readily occur again.

One more instance where working "in the sun's eye" brought its reward occurs to us, and this time it was not a sea view. We were in a harvest field, about six o'clock on a July evening, and the sun was, of course, both low and feeble in actinic power. A picturesque gate was before us, and beyond this a deeply rutted path led to meadows bounded by trees. These trees were in a mist of yellow light, and every ridge in the ground was lighted up almost as if it had been a ripple on water. A labourer with tools slung on his back came through the gate, and we begged him to pause there for one moment while we took a picture. This was most successful, and the shadows of the five-barred gate striking downwards in irregular ribbons tell the observer that it was taken "in the sun's eye."

TOURIST PHOTOGRAPHERS AND THE CHANNEL PASSAGES.

IV.

CALAIS, from the sea, is absolutely uninteresting from a photographic point of view: at first sight a few spires and factory chimnies are seen rising apparently from the water, but as the steamboat draws nearer, a low sandy beach comes into sight. The town is on a flat area of land, but to the west and stretching away to Cape Grisnez are hills and seaside cliffs; some three or four miles west of Calais, on the top of one of the cliffs, may be seen the buildings connected with the Channel Tunnel works, now at a standstill. Some years ago we descended from these works into so much as has been made of the tunnel on the French side; more water gets into the tunnel there than on the English side. Cape Grisnez is the nearest point of France to England, and at different times the project has been mooted and abandoned of constructing a harbour there. In the first place, only three or four miles of sea voyage would be saved; in the second, the sea deepens rapidly there under the cliffs, and has a bottom composed of broken rocks, so that the expense of making a good harbour there would be immense; in the third place, there is no town near, and in the fourth place, a considerable length of railway would have to be made to join the existing line near Boulogne.

Although an exceptional case has been published to the contrary, no objection is likely to be made to anyone taking photographs at and about the marine railway station at Calais, provided that subjects are selected in full view from thronged public thoroughfares; at the worst, the photographer might but be told to pack up his apparatus and walk. If, however, he selected an unusual point of view, and then tried to take the exterior or the interior of some of the forts, he would in all probability be locked up. There are five detectives in plain clothes constantly on duty at the marine railway station at Calais, and they are chiefly on the look-out for political offenders, for whose apprehension they have a considerable stock of warrants on the premises. Sometimes they witness the arrival of one for whose apprehension they have no warrant; from that moment he is watched, and a telegram about his landing is sent to Paris; when he reaches there, he has plenty of unseen friends who are able thenceforth to give a full account of his movements.

Within the last eight or ten years immense improvements have been made in the port of Calais, so that its aspect is greatly changed. Neither the French Government nor Calais cares much for the little trade brought by steamboat passengers, who almost invariably pass through without stopping in the town. The chief idea is to divert some of the trade of the great city of Antwerp by saving ships a voyage farther up the Channel, thus obtaining extra goods traffic for French railways and canals. Perhaps, also, it is thought that the new harbour may be of use in times of war. Some of the larger harbour-improvement works at Calais are not seen by passengers passing close to them; for instance, if they mount the low bank behind the railway station, they will find themselves on the edge of an immense artificial reservoir, or rather lake, not yet in use, but intended to take in water as the tide rises; at low water the sluices will be opened, and the outflow of this great body of water is expected to sweep a deep passage through the sand-bank off the mouth of the harbour. Should it do so, a gale of two or three days from the north-east will pile up the sand again, just as it now undoes the work effected by the dredging boats. Calais can never be a first-rate harbour until a sea-wall is run out to the north-east to prevent the sand getting back again. The old picturesque fortifications of Calais have been pulled down, with the exception of two or three of the towers and gateways, and these are well worth photographing. A great desire existed not to destroy the ancient fortifications, but they covered an extensive area of ground of high commercial value for utilitarian purposes. New fortifications, about six miles long, have been constructed all round Calais and its suburb of St. Pierre; the latter is larger than Calais itself, and is one of the great seats of the lace industry of France. One of the chief lace manufacturers there is M. Darquier, President of the Calais Chamber of Commerce; he is also the Consul of several foreign nations, and is highly popular in the town. Calais altogether is a great place, and not a kind of dirty little fishing village, as ordinarily described in guide books, and as believed by most tourists, for they can see little of St. Pierre as they pass through in the

train. Still, it is not an attractive place to a stranger, and may, perhaps, hereafter improve in its general appearance and in its average quality of hotel accommodation. There are few photographers in it; one of them, M. Landouzy, of the Grand Rue, St. Pierre, is always sent for by the authorities when any photographing of parts of the new harbour works is required; he is, therefore, the best man to go to for pictures thereof.

The new and fine Central railway station at Calais was opened a year ago; at the present time men are glazing the roof. The old railway station, so well known to many of the readers of these pages, is now used as a goods station only; it is in a deplorable condition; all its glory has departed. Its roof is falling in, and grass is growing freely between the rails outside the building. The place, nevertheless, in its main features is as of yore, and is worth photographing for the sake of old acquaintance. The old harbour adjoining is now used for cargo vessels and petroleum vessels, but not for passenger traffic.

When the new harbour works were in full progress, we went over them with Mr. Vertillard, their chief engineer, who narrated an interesting scientific fact discovered during their construction. Piles, in vast numbers, had to be driven into the sand, but, shoe them with iron or shoe them with steel, all efforts were in vain; their ends would get blunted like carrots, but no power could drive them into dry sand. Some genius, whose name we forget, made an arrangement whereby water was caused to constantly trickle down each pile, so as to wet the sand immediately under the shoe; the piles could then be driven with ease. Mr. Vertillard was then a comparatively young man to be entrusted with the command of such a great undertaking, but his abilities were equal to the task; he is now chief engineer to the whole district, and resides at Boulogne.

Recent statistics issued by the French Government show that the passenger traffic of Calais is steadily increasing, and that of Boulogne decreasing. A tax of eightpence is imposed upon every passenger who enters or leaves Calais harbour; the amount is included in the cost of the railway ticket. Nothing of this kind is done in Belgium ports, and in Belgium the ordinary railway fares are much lower than in France for equal distances. At the buffet and hotel in the new station on the Calais pier the charges are among the highest in Europe.

Murray says of Calais:—"An English traveller of the time of James I. described it as 'a beggarly, extorting town; monstrous dear and sluttish,'" and adds that, "in the opinion of many, this description will hold good at the present time." Prices are somewhat high in town, partly because of the heavy octroi duties.

Among the historical architectural subjects worth photographing in Calais is what is known as "Hogarth's Gate," built by Cardinal Richelieu in 1635; the Hotel de Guise, once the Guildhall, and in which Henry VIII. occasionally lodged. There are also several ecclesiastical and civil buildings of historical interest in and near the Place d'Armes, the chief square in Calais.

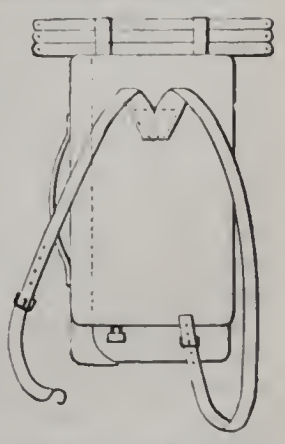
HOW TO CARRY THE CAMERA.

BY CAPT. ABNEY, C.B., D.C.L., F.R.S.

It has struck me that it would be well to place on record some experience that I have gained regarding the carrying of photographic apparatus in mountain expeditions, and this, perhaps, is best done now whilst I have in my mind a recent Alpine tour over high level passes from Chamounix to Zermatt. In the first place, it may be mentioned that when one cuts off from the base of communication (one's portmanteau) for four or five days, it is a necessity that the baggage taken should be as light as possible, and also—which is equally important—as convenient to carry as possible. We may leave the question of personal baggage, merely remarking that an Alpine sack will contain sufficient garments for changing for two persons, together with a spare box of plates or a few dozen films, and that a porter can readily carry the lot, together with a small provision sack.

How to carry a camera is another important point, however. It may be premised that if a 12 by 10 camera has to be taken, it will be found almost essential to have an extra porter for the case containing the slides and extra plates, leaving the guide to carry the camera itself and the legs. The tourist, however, generally confines himself to a 7½ by 5, or a half-plate camera, and it is to such sizes that the following remarks apply. My own tourist camera, of the first-named size, is contained in a leather case 18 inches by 11 inches by 5 inches. In this case is a camera by Meagher, made specially light, and, being of his usual excellent workmanship, has stood four seasons' rough usage without harm. It expands to a focus of 26 or 27 inches, and occupies just half the leather case, five slides of very light construction occupying the other half. It weighs about 12 lbs. when full.

To carry this I have had knapsack straps attached. The accompanying figure will give an idea of the way the straps are attached. It will be seen that the usual handle to what may be called the lid of the case remains. Each strap can be shortened at pleasure by means of buckles, so as to fit the height or back of any porter. The weight by this arrangement is distributed properly, and was carried by my guide for several days without the slightest inconvenience; in fact, he said it was a pleasure to carry it. I suppose the pleasure consisted in carrying it rather than the heavier provision sack. The legs are packed at the top, as shown, with two straps. I have myself carried this camera, as arranged, many hours, and found it much easier than when using the ordinary sling straps. A relation of mine has also been travelling with the same sized camera, but divided his camera from the slides, having knapsack straps put on each. The same guide carried this camera alone up the "Nord end" of Monte Rosa, and when he returned, declared that he preferred my camera, though heavier, as it fitted so much better into his back. To those who mean to travel with a



camera, I recommend the arrangement indicated, as it can be readily fitted to any camera case, and cost me five francs to have attached at Chamounix. It may be thought that a sling answers all purposes, and this I believed until I was persuaded to try the knapsack arrangement. The late Mr. Donkin carried his own camera, and always used knapsack straps, but I cannot recollect the form of his camera case. Suffice it to say, any case, in climbing rocks, which is not attached tightly to the body, is a source of annoyance, if not of danger.

THE PROGRESS OF THE PHOTO-MECHANICAL PRINTING PROCESSES.

BY HERMANN E. GUNTHER.

V.—PHOTO-ENGRAVING.

THE improvements made within the last few years in photo-engraving—or phototype, autotype, and heliotype, as the same process is termed in Germany—are striking. We have scarcely any illustrated journal of importance without photo-typographic illustrations, and most of them are so good as to stand comparison, artistically, with the best woodcuts. In the reproduction of paintings or drawings, the photo-engraving processes are especially of the highest capability, provided that the printer of the blocks possesses the same skill and experience as the photo-engraver.

The head-quarters of photo-engraving in this country are Munich and Vienna, each of which has worked out its own method. The production of the negatives for subjects in half-tone is identical in both methods. A transparent screen plate is placed in front of the collodion plate inside the camera, at a distance of about 1-52nd to 1-13th inch of it, according to the degree of contrast exhibited by the subject to be reproduced. The two methods differ materially, however, as regards the production of contrast or degradation of the tones, which forms one of the most important operations of the whole process. I am indebted to Mr. Joh. Kloth, a very skilled photo-engraver, for some information about this part of the two above-mentioned methods.

According to the Munich method, the degradation is produced solely on the zinc plate. The shadows of the already roughly-etched zinc block are covered with varnish, the outlines are drawn in, and then etched in a weak acid bath. This covering and re-etching proceed over all the degradations of tone, until the points in the highest lights have acquired the utmost fineness. The nitric acid is used in the proportion of about 1 : 70, and the duration of the etching process varies from ½ to 2½ minutes, according to the degree of contrast desired. This can only be ascertained by experience.

In the Vienna method, the endeavour is to obtain the degradation directly on the photographic negative, which is attained by employing the finest possible screen plate, by a suitable arrangement of the subject, and by retouching the negative. On the production of a suitable screen depends very much of the success, this being, at the same time, undoubtedly the most difficult part of the entire process. The screen may be either ruled directly on glass, or a reduced photograph may be taken from a ruled plate. Care should be taken that the lines of the ruled sheet are as fine as possible, because otherwise the shadows, which are to be broken up in dots or stipple by these lines, will turn out much too light. These dots should not be too small, since the stronger light in the lighter portions of the image will cause the dots in these portions to be soon blocked up. With regard to the size of the dots, it may be mentioned that, according to the Munich method, 104 to 130 lines go to the inch, whilst the Vienna method requires 150 to 180 lines to the inch. Now, since the lines breaking up the shadows into dots or stipple should be equally fine in both methods, it follows that in the Munich method the intervals must be much larger than in the Vienna method. This is proved by the fact that these larger dots must bear a prolonged action of the etching fluid, until it is possible to produce all the degradation desired; nor should any of the dots be wanting in the highest lights. The proportions of the intervals to the line are with the Munich method about as 2½ to 1, whereas the Vienna method should be as nearly as possible 1 to 1. The Munich method is undoubtedly to be preferred, for the less the number of the dots within the corresponding space, the larger they will be, and the lighter the ground will appear on which the few dots are standing, if they are etched back to the utmost fineness. Besides, the larger dots yield darker shadows, because they present fewer interruptions. This latter quality is important, since it enables the photo-engraver to produce all the required half-tones, even the softest ones, by etching.

The etching process for transfers on zinc has been fully described by Mr. F. G. Albert in Professor Eder's Year-Book. The method is both original and simple, and gives good results, for which reason it has been adopted by several large establishments. The main points of this method may be here reproduced.

After the impression has been transferred to the zinc plate, it is dusted with asphalt (10 parts of Syrian asphalt, 1 part of yellow wax, melted together, and, after cooling, rubbed down to finest powder). The excessive powder is then removed by means of a pad of cotton-wool, and the plate warmed over a spirit flame, until the asphalt of the transfer has acquired a dark colour. While the plate is still warm, the edges and the back of it are coated with spirit varnish, and, after drying, the plate is placed in a dish containing 2,000 c.c. of water and 25 grammes of nitric acid. In this solution the plate is rocked for five minutes, when the dark deposit which has formed on the surface is removed with a moist sponge. To render the transfer resistant to the etching process, the plate is covered with the following ink:—

Chalk ink, No. II., for lithography ...	10 grammes
Yellow wax	10 ,,
Venetian turpentine	15 ,,
Beef-tallow	5 ,,

The mixture is melted, and, after cooling, 40 grammes of chalk ink No. II. are rubbed in, because the latter is difficult to melt. A small portion of this ink—more or less, according to the fineness of the image—is placed, by means of a palette-knife, on a lithographic leather roller of middle-fine grain, distributing it evenly upon the slab by rolling vigorously upon it with the roller.

A NEW SPECIES OF IVORY.—Celluloid has taken an important place in photography, and now we have a new kind of ivory, just patented, and which may prove useful in making positive prints, as it very greatly resembles real ivory. This composition is made by mixing pulverised or granulated ivory (waste), 8 parts; fish glue, 20 parts; French chalk, 5 parts; water, 40 parts; brandy, 2 parts; cotton, 2 parts (by weight). These substances are mixed, heated over a water bath until the boiling point, shaken up mechanically for about ten hours, kneaded, and then rolled.—*Revue Photographique.*

THE CARTE-DE-VISITE.

BY JAMES MEW.

The expression carte-de-visite has become synonymous in the public mind with a photographic portrait of a particular size and shape, but a little reflection about the meaning of this compound term will show that this could hardly have been its original signification. Nor was it. The carte-de-visite, which we have of course borrowed from the French, referred, in that language, primarily to the oblong piece of polished or glazed card or paste-board which is commonly given on ceremonial occasions to the servant of our friend when we make our so-called "call"—that visit of professed solicitude rendered compulsory by the fashionable code—and find, often with heart-felt but concealed satisfaction, that our friend is, in the stereotyped though too often false formula of the day, "not at home." On such an occasion as this, before the carte-de-visite was known, the visitor of the olden time would anxiously seek after pen and ink, or pencil and paper, and, having written his name, go away with a happy sense of repose like that of Longfellow's village blacksmith, and a sweet consciousness of something accomplished, and of a duty done.

But many times, surely, in those old days the pencil was not to be found, the ink turbid and scanty, the pen resembling a meat skewer, and the paper, by too constant manipulation, covered with an adipose film. Under these circumstances, doubtless, the carte-de-visite was born. From the brain of some visitor labouring with a rigid pen smeared with viscous ink to inscribe his name upon greasy paper, sprang forth like a second Minerva the neat, oblong little card with the name already written or printed thereon; the little card destined to play afterwards so important a part in those morning "calls," which, says an atrabilious cynic, are made by persons privileged by a charter of society to wander about from house to house, obstructing the acquisition by others of that knowledge which they are themselves unable to impart and unsolicitous to attain—people who, having nothing to do, and no business of their own, hinder the business of their acquaintances; people who, having nothing to say, insist on sitting out the full twenty minutes—the present period of the morning call—to say it, in company of those unhappy ones who by some evil fate have become their friends.

The carte-de-visite, when it meant only "the visiting-card," in process of time fell under the edicts of fashion. It was large with the name small, or it was small with the name large. It presented the appearance of watered silk, or of porcelain; it was of various colours. It was adorned, as some of the cards of our advertising tradesmen are adorned at this present, with many varieties of ornamentation. In the land of its birth, the carte-de-visite, in the days of Napoleon, bore the name of its proprietor, overshadowed by the majesty of the outstretched wings of the Imperial eagle. In the days of the Restoration, that same name reposed on a fair field, diapered with *fleurs de lis*. This was the artistic carte-de-visite. The autographic carte-de-visite succeeded it, bearing the facsimile of its owner's signature; and this, perhaps, is the nearest approach made by the carte-de-visite, as it was originally understood, to the carte-de-visite in its present popular signification. From the likeness of the handwriting of the name arose the likeness of the features of the face, and so it has come to pass that we now find "carte-de-visite" admitted into our English dictionaries, and defined with an exclusively photographic meaning, as a "small likeness gummed on a card," a statement barbaric in its plainness, but substantially correct, though some doubt may be entertained about what succeeds, "so called from photographs of very small size, having been originally used as visiting-cards." How far this latter part of the dictionary definition may be consistent with fact there is little evidence to show. One witness, however, has already appeared in favour of it in an old number of the Photographic News, for Feb. 24th, 1865. In this it is to be found that a certain Mr. Skaife had recently favoured this journal with a specimen of a visiting-card portrait—our present carte-de-visite—of a date many years earlier than the actual advent of the present photographic fashion. It is a card containing a wood engraving of a full-length figure, slightly grotesque in design, of Dr. Parland, who left it as a visiting-card at Mr. Skaife's residence, Vanburgh House, in 1851.

There is generally a difficulty about exact verification of dates. We are assured that cartes-de-visite were popular in Paris three years at least before they were introduced into London, and it is clear that Disdéri, on his own testimony ("L'Art de la Photographie," p. 146), was the first to take out a patent for photographic cartes-de-visite in 1854. "*On sait quelle popularité je lui ai rendue*," says this author; "the world is well aware how I helped to bring photography into sudden popularity by my invention of the carte-de-visite." People who were tired and sick of portraits more or less ugly and deformed, obtained by the use of instruments impotent to preserve on a large scale the harmony of human proportions, received with enthusiasm these very little images, in which their friends were seen at full-length, in their ordinary attitudes, and designed with an accuracy which charmed the eye of those least experienced in the subject of art. The carte-de-visite was calculated to spread abroad in profusion visions of artistic beauty. This, at least, is the idea of its author, an idea which subsequent experience may have slightly modified. Another advantage claimed by Disdéri for his invention is that it enabled people to make collections of portraits of public celebrities—to form, in short, a popular gallery of delight, for the gratification of that curiosity which has been called idle, but is, according to Dr. Johnson, a leading feature in the intellectual dignity of mankind.

In an early period of its existence the carte-de-visite met with some hard words from a journal of the time known as the *Reader*. This periodical, speaking of card pictures, as they were then called, says, "These photographic likenesses bring out all that is most vulgar and pretentious in our age, officers and civilians attitudinizing in their respective uniforms, and—worse still—clergymen with the Bible in their hands in their preaching attitudes (fancy St. Paul posing himself for a photograph in the attitude in which he addressed the Athenians); ladies in moire antique and babies in long clothes—all bidding for public notice." It is a severe sentence, but the *Reader*—perhaps a disappointed photographer—was doubtless very wroth. It is easy to understand a man objecting—as, for example, Dr. Pusey is said to have objected—to have his portrait taken, but why any clergyman with or without the Bible in his hands, or why even St. Paul himself should not have been photographed, if a camera had been handy, we are unable to conceive. On the contrary, the carte-de-visite of that Saint as he appeared addressing the Athenians, or any other congregation, might be not

only a satisfaction to the sincere Christian, but also of no little adminicular service in the support of religious faith.

But the *Reader* will have none of it. "There may be," it continues, "and we believe there is, an amiable motive at the bottom of it all." Would that the ghost of the *Reader* might be called up to explain this sibylline sentence, "the amiable motive," and "the bottom of it all." "But surely the great majority of these good people might forbid the public exhibition of their beauty or ugliness, especially when there is no human thought or faculty present in the production of their portraits"—another mystic period—"the presence of which alone justifies the portrait painter in the exhibition of his work, and redeems it from impertinence."

The *Reader*, who would surely have fallen into a fit if he had walked through any one of our principal thoroughfares in the present day, adds that the exhibition of the photographic likenesses of "public characters" in shop windows is perhaps one of the penalties imposed upon them, but "ordinary individuals" are not called upon to exhibit their portraits in a photographic exhibition unless there is really some remarkable improvement in the process by which they are gibbeted for public display. It seems never to have occurred to the indignant mind of the *Reader*, that by what was at the worst a little harmless vanity, a large number of tradesmen were enabled to provide meat, clothes, and fire for themselves and for their families, and that it would not be always easy to draw a line of distinction between the "ordinary individual" and the "public character."

The famous lexicographer, in his "Life of Pope," describes the careful ingenuity of that poet to bring about the publication of his letters, which he desired to enhance his popularity, without his own apparent consent.

The story of Curll, the bookseller, and the visit paid to him one evening by the man in a clergyman's gown but with a lawyer's hand, is generally known. Had Pope lived in these modern days, he needed not to have taken so much pains to attain his end; he might have fed his vanity in a way far more effectual than by the publication of his letters. The carte-de-visite would have provided him as it now provides—who shall say how many—prize-fighting pugilists, music hall singers, parsons, actresses, titled ladies, lawyers, physicians, fasting men, military men, strong men, and infant phenomena, musical or otherwise, with a refined advertisement easily obtainable, and at the public expense.

(To be continued.)

Boletin do Gremio Portuguez is the name of a new amateur magazine published at Lisbon.

DEVELOPING TRANSPARENCIES.—Captain Pizzighelli gives the following formula of a developer for transparencies:—A. Dissolve 39 grammes of citric acid in 135 c.c. of water, and neutralise with aqueous ammonia. Should too much ammonia be used, it must be removed with the aid of heat. Then add 26 grammes of citric acid, and the solution is diluted so as to make 270 c.c. B. Solution of ferrous sulphate, 1 : 3, slightly acidified with sulphuric acid to prevent its oxidation. C. Solution of chloride of sodium, 1 : 30. To develop take—A, 10 parts; B, 5 parts; C, 1 part. Chloride of sodium is a powerful restrainer, and should be used with care. Sulphate of iron, in a larger proportion than that indicated, retards development. By diluting the developer, we obtain prints that are soft and of less intensity. Gallic acid acts as an accelerator. It produces sepia tones; to the above solution we may add two and a half parts of a solution of gallic acid at one per cent. By this process we are certain to produce excellent transparencies.—*Revue Photographique.*

THE USE AND ABUSE OF HAND-CAMERAS.*

BY R. P. DRAGE.

IN opening this discussion, I should like to say that I had no idea, when suggesting the subject, that I should have to open it, but I fancy Mr. Cowan, who proposed that I should, was bearing in mind some jocular remarks made by myself on the occasion of our last outing on the subject of hand-cameras, or luncheon-boxes, as I called them. I believe on that day about half of our number carried hand-cameras. Well, there are some of our members who can take out a hand-camera and a dozen plates, and can bring home twelve pictures. They are men whose names, we may say, are as household words in photography, and they deserve every credit for the labour and time expended in perfecting their experience and apparatus; and there are many more workers like them throughout the country, men who have thoroughly mastered the two great factors, as I take it, in this matter, which are, judging distance, and development; but these, we find, form a very small percentage of hand-camera users. What do the dealers say? "People are buying these hand-cameras extensively; they treat photography as a toy." One hears on every side, "Quite easy, you know; you push the button and the thing is done!"

These new recruits of ours consequently take out their dozen plates and fire away regardless of lighting and subject: sometimes they get one fair negative out of a dozen exposures, and that result is about the proportion for their first gross or two of plates. Naturally they get discouraged, and a large majority of them turn the thing up in disgust. As an example, at Bettws-y-Coed lately I met a young American lady who was going about there snapping at all those beautiful scenes with a kodak. In conversation with her I ventured to hint at her probable non-success, but I was completely silenced by her answer that the dealer in New York, just before she sailed, told her it would take anything. I also met a gentleman in the same locality carying a very neat, morocco-covered detective: he was just going to take the Miner's Bridge with it, he told me. Many other instances of the "abuse" side might be noticed; there is the playful habit some gentlemen have of taking their fellow photographers in all sorts of grotesque attitudes.

Taking a view at St. Albans on our last Bank Holiday outing, and trying to arrange a group of children in the foreground, I was mercilessly snapped at by three hand-camera men. I show results of two; I have not seen the others yet, but they will, no doubt, be shown on the screen in due time.

In conclusion, I should like to appeal to all who follow this interesting art not to allow themselves to be led away by this fashionable craze; it is all very well to grumble about carrying the tripod, but let us think what will be the future of landscape photography if we allow such a thing as a little extra weight to carry to count as a factor in our picture seeking.

It is granted that hand-cameras are indespensable for such as street views, or on the beach, or on shipboard, but they are decidedly out of place for use as picture producers. Therefore let us oppose all attempts to popularise the use of hand-cameras at our photographic outings, the high standard of pictorial excellence to which landscape photography has attained being in great danger of reduction by the use and abuse of hand-cameras.

* Read before the London and Provincial Photographic Association.

UNVEILING THE AMERICAN DAGUERRE MEMORIAL.

On Friday, August 15th, the ceremonies connected with the unveiling of the monument to Daguerre took place in the National Museum at Washington. During the recess at the close of the Photographic Convention, the workmen at the Museum were busy draping the memorial of Daguerre, which was placed in a niche in the rotunda. From the balcony above the statue were hung two great flags, side by side, the stars and stripes and the tricolor of France making a graceful and effective screen to hide the bronze figures until the time arrived for unveiling.

At the south end of the rotunda a platform was erected, on which were a number of seats to accommodate prominent personages. Gradually the crowd which had separated after the adjournment of the morning session began to gather again, and before 2.40 p.m. there was a fair number of people in the Museum.

A few minutes before the appointed time Mr. Secretary Noble made his appearance, and was at once escorted to the platform, where he held an informal reception ; many of the officers and prominent members of the Photographic Association of America were introduced to him, as was also Mr. Hartley, the sculptor of the memorial.

Mr. H. McMichael, of Buffalo, the Chairman, delivered the opening address. Among other things, he said :—"Although it may seem extravagant appreciation of the man to whose memory we offer to-day lasting and substantial tribute, I trust I do not misrepresent the voice of this Association when I say it is one of the most significant events that has ever happened in this American capital. Inspired by the thought that this body, as only an inconsiderable fraction of the thousands now engaged in various phases of the photographic art all over the globe, might erect in suitable form an enduring monument to the founder of our craft and our profession, this Association has ordered the work to be executed. The statue is in conception entirely out of the commonplace or conventional. It presents a simplicity in keeping with the camera, which, while one of the three greatest inventions of modern times, is also the most universal over the earth by the very reason of its primitive character and processes of manipulation. Travellers all over the world carry with them the instrument that brings home such enduring memorials of their experiences. The camera has been the headlight of science. It has explored the moon and the planetary system. To the newspaper, the courts, and the surgeon, it has become a useful assistant. If humankind be here considered, may I not ask is this not better than steam by land or sea, electricity or dynamite projectiles? We can all appreciate the story this memorial tells. The figure of Fame in reverential pose places the laurel wreath about the head of Daguerre, and it extends around the earth, thus typifying the universal blessings combined by the great Frenchman, and the pedestal is a granite Atlas on which, we may believe, this artistic and eloquent composition will rest for ages yet to come."

Mr. Noble, the American Secretary of State for the Home Department, responded in an eloquent tribute to the great French inventor, whose genius is to be commemorated by the monument, opening his address as follows :—

"Fame enwreathes the globe with the glory of Daguerre. His name might be properly inscribed upon the figure of the sun. With its divine light his name will evermore be associated ; with its brightness his genius will be illumined for all time. The earth and the firmament show forth the handiwork of the great Creator, but their most hidden forms have been, and are yet to be developed by that art, the secret of which God gave Daguerre."

The speaker did not overlook the claims of Scheele, Wedgwood, Seebeck, Talbot, and Daguerre's associate and compeer, Niepce, yet, he said, the practical invention was the result of months of toil in the laboratory of Chalons of the one whose name was being honoured. Daguerre not only found the secret, but he gave it to mankind. He added :—

"It is most appropriate to have placed in the capital of our Republic to-day a monument of one who commenced his career as an artist, in very truth, at the foot of the ladder ; who obtained means for testing his already conceived invention by exhibiting the first fruits of his search—the diorama—and amid the most marked characteristics of whose genius was an unfailing reliance on his own industry. In our country the lesson cannot be too frequently taught, that for intelligence and industry the way to success and distinction is ever open. The Republic knows no class, and even as the sunlight enveloping the globe vivifies and beautifies all that seeks its light, so does liberty embrace, sustain, and reward the souls of all that aspire and work. The American Association of Photographers may proudly place at our National capital the statue of this founder of the art it cherishes, whose life and success illustrated anew the dignity of labour."

It might, he remarked, be said by some that if Daguerre had never lived, photography would have existed. His answer to this was that many sailed, but Columbus discovered. The country was his who first erected his standard, and invited all people to its shores. He illustrated this point with a pathetic story of a youth who, having discovered what Daguerre afterwards utilised, was refused assistance, and he and his secret were lost sight of for ever. Daguerre both discovered and made known.

From the first experiments of the great Frenchman, Mr. Noble followed the progress of photography to the present time, enumerating some of the blessings it had been to mankind.

"To-day," he said, "the movements of the fleetest horse are caught as if he were suspended in the air. Wheels of the swiftest locomotive are so instantly impressed that the spokes in the driving wheels of a forty-mile train appear the same as if at rest. The bird in its flight is pictured with the shots that are rushing to overtake it. The lightning's flash is caught, and the dropping rain presented with it and by its light. The telescope has indeed revealed many secrets of the sky, but with the mightiest telescope that man has ever made there is not presented to the human eye worlds that through it are depicted upon the plate of the photograph, and thus, and thus only, transmitted to human intelligence."

He next spoke of composite photographs, and the results which had been obtained in composite pictures of Washington.

May not this suggest, said he, to devout minds even a higher conception that, were all the features of all the human faces that God has made portrayed and successfully combined upon the photograph, we might have therefrom produced the true features of the Saviour, the perfect flower of all humanity!

After paying a high compliment to Mr. J. Scott Hartley, the designer of the monument, the Secretary closed as follows:—

"Americans have not been unfaithful stewards of the talent entrusted them by France. The improvement to its present wonderful stage of advancement, and the enhancement of the commercial value of photography, has been in great part the result of the activity of our native inventors. They have improved the camera, the shutters, and especially the sensitive films or surfaces.

"As the Secretary of that Department of which the Patent Office is the most valuable and advancing portion, I thought it but my duty, however feebly, to meet you and to aid you; you are bees of this hive, and your king will be he who does most for the art of Daguerre.

"But, gentlemen, your art, that in some sense may be deemed to have rivalled nature's own lenses, cameras, and tablets, cannot hope to reach, as some have vainly thought, to the spiritual world, the realm of spirit. You may depict the homestead, but the happy memories of childhood, the affection of parents, the hopes of youth, the aspirations of manhood, the belief in God, and the fraternity of man, are printed on the mind by the Great Photographer of the soul, that when the stars shall fade away, the sun himself grow dim with age, and nature sinks in years, shall flourish in immortal youth, unhurt amidst the war of elements, the wreck of matter, and crush of worlds.

"May we all take care not only of success on earth, but that the form we are imprinting on the great hereafter will unite these with the great souls who have deserved their highest reward by living for the good of man."

Literary Notices.

BURTON'S MODERN PHOTOGRAPHY, comprising Practical Instructions in Working Gelatine Dry Plates, Printing, &c. By W. K. Burton, C.E. (*London, Piper and Carter, 5, Furnival Street, E. C.*)

THIS is the ninth and greatly enlarged edition of a deservedly popular work. It is only about three years since the book was last revised, but during that time there have been so many advances in photography, that the author has found necessary a complete revision of the work, the re-writing of a great part of it, and the addition of several new chapters. These have reference chiefly to the matters of development, orthochromatic plates, and printing processes. An excellent feature in the present edition of the book is the introduction in foot-notes of the French decimal equivalents for English weights and measures. On this subject Mr. Burton says:—

The system known as "Apothecaries' weight" has been adopted throughout this book, because it is that most generally used for practical chemical and photographic work in this country. But it is unnecessary to say that the French decimal system is vastly superior; but, in the case of all formulæ, a corresponding formula in French decimal measures and weights is given in a foot-note in the present edition. It has not been attempted to make these correspond exactly with the English weights and measures. It would involve very odd figures, and often many decimals, to do so; and, as photographic formulæ are generally very elastic, it is considered that it will be of more convenience in practice to give formulæ that are practically correct, and that are in round figures, than to exactly reproduce the proportions given in the English formulæ.

Mr. Burton, some months ago, made a long experimental research into the merits of eikonogen as a developer, and the conclusions at which he has arrived are thus briefly summarised in the book now under notice:—

This developer was introduced in 1889, and immediately produced a great sensation. It was claimed for it that it would permit of good negatives with a much shorter exposure than was possible with any other developer, that it gave a better colour of negative, and that it did not stain the hands or anything else. In my experience it allows of a *very little* shorter exposure than other developers, and certainly gives a good colour of negative, though not, I think, better than that given by hydroquinone. It is certainly, when mixed with sulphite of soda, an extremely clean developer, with apparently no tendency at all to stain.

The substance is used in the same way as pyro, but two or three things must be closely observed. In the first place, it is necessary to use much more eikonogen than would be necessary in the case of pyro. In the second place, only carbonates can be used as alkalies, as caustic alkalies produce colour fog; and, in the third place, if a restrainer is needed, it must not be bromide of ammonium, but either bromide of potassium or bromide of sodium.

He expresses the opinion that pyrogallol is still the best all-round developer we possess.

The following paragraph from the pens of Mr. A. Pringle and himself, about a simple method of orthochromatising plates, may be of interest:—

Of all the processes tried by the writers, none seems to them more satisfactory—certainly none is more simple—than that last suggested by Mr. Ives, of Philadelphia. It may be stated thus:—In four ounces of absolute alcohol dissolve one grain of erythrosine or cyanine. Soak the gelatine bromide plate in this for a minute. Allow to dry. Wash for a short time in running water. Dry, and use. No alkali used. The plates keep well. The cyanine renders the plates so very sensitive, even to red rays, that these operations as well as development must be conducted practically in darkness. The erythrosine formula has proved in our hands eminently satisfactory, the cyanine no less so, but the precautions necessary with it apt to be irksome.

The first edition of this book was published in 1882, and may be remembered by many by its first title, "Burton's A B C of Photography." The latest edition has an index, which shows the advance that has been since made.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Subject, Sept. 11th, "Carbon Printing," opened by Mr. W. E. Debenham; Sept. 18th, "Is there any Advantage in the Use of a Large Object Glass in an Optical Lantern?" Mr. Freshwater; Sept. 20th, last outing for the season, Hampstead—tea, "Bull and Bush," 6.30.

AN OPEN AIR LANTERN ENTERTAINMENT.—An open air lantern entertainment calls for management of a different nature compared to that in a hall. However, Mr. E. H. Stevenson, of Norwich, proved himself quite equal to undertaking such a task, and on August 14th gave an exhibition to an audience of five thousand persons in the dell of the picturesque ground of Mr. H. Trevor, of Norwich.—*Magic Lantern Journal.*

NOVEL CARD FRAMES.—Messrs. Marion and Co. have just issued some novel card frames inscribed with rich designs and mottoes appropriate for Christmas and other seasons. A photograph, a drawing, or a water colour picture may be slipped into the front of these frames, and so become an elegant Christmas present. Each card mount, or frame, has a strut back; thus it serves the entire purpose of a frame; it is made of fine cardboard, and is much cheaper than the ordinary plush or leather frame. Messrs. Marion and Co. say that photographers will find them suitable for the display of their photographs in the shop window or reception room, as well as for sale. They have sent us some specimens, and we think these card frames likely to become highly popular.

EIKONOGEN.

Our readers will remember that the earlier samples of eikonogen that reached us varied considerably in appearance, solubility, and developing power, and, if we may judge from correspondence, both private and published, the variation still continues, although to a limited extent. But the statements of such correspondents—and, indeed, of a considerable number of hard-working, earnest, observing photographers as well—must be taken *cum grano salis*, large allowance being made for the influence of individuality, and the tendency to overlook the influence of what may seem trifling causes of interference to the untrained observer.

In view of the large amount of space that has been given by the various periodicals to eikonogen formulæ, and discussion thereon, we can almost sympathise with one student of photographic literature when he writes that "the eikonogen hobby has been ridden to death," while, at the same time, we are anxious to be helpful to many others who write somewhat to this effect: "What about eikonogen? Do you like it as well now as you did when you last wrote about it, and do you still recommend the formula as given on page 217 of last volume?" To those we reply that we still like eikonogen; like it, in fact, better than we did then, just as we do every thing and all good people the better we become acquainted with them. We like it because of its cleanness, its non-liability to stain the negative, its good keeping qualities, its persistent developing power, and its apparently equal suitability for various kinds of work; employing it, as we do, indiscriminately on gelatino-bromide plates, lantern slides, bromide paper, transparent film, and positive celluloid. And last, but not least, we like it because of its greater economy; as, although a six-grain solution costs more to begin with than the average three-grain solution of pyrogallol, the latter will be practically exhausted or discoloured beyond further use by the development of a single negative, while the former will be clear and able for more work after having developed six.

Eikonogen, as found in the market at present, in a decidedly crystalline form and of a light yellowish colour, is more uniform than when we last wrote on the subject; and recent experiments with various samples show that in the presence of twice its weight of sodium sulphite it is soluble to the extent of nearly, but not quite, twenty grains to the ounce of water. Taking this as datum, and believing in formulæ that demand the smallest amount of calculation or measuring out, we adopt in our own practice, and recommend the following:—

A.

Eikonogen	...	...	1 ounce avoirdupois
Sodium sulphite	...	...	2 ounces ,,
Water ...	...	...	... 22 ,, fluid.

Dissolve the sulphite in the water, warm it if in a hurry, and add the eikonogen, shaking till dissolved.

B.

Sodium carbonate	...	...	2 ounces avoirdupois
Water ...	...	...	... 22 ,, fluid.

Dissolve.

For the development of ordinary plates that have got something like a fair exposure, one ounce each of A, B, and water will make a developing solution that leaves nothing to be desired, giving perfect detail and full density within a reasonable time, while the deposit is of such a nature as not to lose much in the fixing solution.

We have experimented with both potassium carbonate and the caustic potass and soda salts, but do not like either of them. The former possesses no advantage over the soda, and the latter, while they seem to increase the action of the eikonogen, are fatal to the keeping qualities of the solution after having been once employed, it becoming dark and muddy in a very short time. That the keeping qualities of solutions of eikonogen with sodium carbonate, after use, are greater than is generally understood, may be known by the fact that we have to-day developed a technically excellent negative with a solution that has been used over and over again, and some part of which was made in November last.—*The Beacon.*

PRIZES AWARDED AT THE AMERICAN PHOTOGRAPHIC CONVENTION.

Just before the close of the American Convention, when it was announced that the grand prize committee was ready to report, there was a rush for the hall from the corridors and adjacent rooms. The report awarded the grand prize trophy to Mr. George H. Hastings, of Boston, and the Convention approved the decision by applause. The grand prize was offered for the three best photographs illustrating Tennyson's "Enoch Arden." The trophy is in bronze and gold, and represents three figures running a close foot-race. It is a work of high art, designed and manufactured in Paris.

The other committees on awards reported as follows:—

Class A—A beautiful silver plaque, mounted in plush, representing "Victory," for the best exhibit of genre photographs. Awarded to S. L. Stein, of Milwaukee.

Class B.—One gold, one silver, and one bronze medal for the best collection of portrait photographs. Awarded to Dana, of New York, first; J. Lundy, of Cincinnati, second; and P. O. Scott, of Chicago, third.

Class D—Heimberger and Son, New York, gold medal; Miss C. E. Sears, of Boston, silver medal, and Zybrack, Niagara Falls, bronze medal for landscape photographs; Allen and Rowell, Boston, silver medal, for marine views; E. W. Lincoln, silver medal, and George Hastings, bronze medal, for best collection of architectural views.

Class E—F. T. Clarke, silver medal, and C. P. Wilcox, bronze medal, for best retouching.

Class F—W. G. Kimball, silver medal, and Rothengatter and Dillon, bronze medal, for plain enlarged photographs.

Class G—C. H. Codman, medal for best invention for photographers produced during last year; an improved camera-stand.

Class H—Lafayette, of Dublin, and J. Hannah, of New Zealand, for best foreign displays.

In the private awards Mr. Motes, of Atlanta Ga., captured the Anthony prize of $100 for best plain enlargement, and Mr. A. A. Knox, of New York, $50 for the best worked enlargements. Mr. C. E. Vredenburgh, of Elizabeth, N. J., took the $50 prize offered by the manufacturers for the best work with "climax" films. The air-brush prizes were won by Mr. P. Fleming, for best water-colour painting, and Mr. C. G. Waldeck, of St. Louis, for a black and white portrait. The Knorr Manufacturing Company's prize of $100 for the best print on "diamond" albumen paper was awarded to Rose, of Providence.

The Convention then adjourned *sine die*.

Texas Siftings says that there is something at the seaside this season worse than sharks. It is the amateur photographer, with his tripod and camera.

Notes.

To illustrate the danger which may attend the use of certain explosive powders containing magnesium, the *Moniteur* recommends the mixing of a few grains of magnesium powder with a few grains of permanganate of potash, then to place a fifth of a gramme of the mixture upon a piece of white iron, and to moisten it with a single drop of glycerine. A blow will cause the mixture to explode with terrific violence. A mixture of magnesium powder with powdered chlorate of potash is equally dangerous, especially if some organic matter be also present; such a mixture is far more violent in combustion than gunpowder, and is liable to go off from accidental causes, such as friction. The only safe way of using such explosive powders is to keep the ingredients in separate bottles, and then to mix a few grains in all, when an explosive magnesium compound is required for use. The mixing is best done with the feather end of a quill pen. Not a few fatal accidents have occurred from the explosion at unexpected times of mixtures of chlorate of potash with foreign matter. By itself the salt is harmless enough.

Last year the price of standard silver averaged rather more than three shillings and sixpence an ounce; at the present time its price is four shillings and sixpence an ounce. To what extent this great rise in price may be due to combination by individuals, or to prevalent public opinion that the value of silver must go up, is not publicly known. The American Treasury is purchasing silver at the rate of two million ounces per month more than it did a month ago, but that by itself does not account for the large increase in the price of the metal.

From the *Evening Standard* we glean some particulars about the ascent of Mont Blanc by Dr. Janssen, to make spectroscopic observations at a height of 4,050 metres above the level of the sea, and only 400 metres below the summit of the mountain. He was drawn up in a sledge by fifteen men, because of his state of health and his advanced age. It is said that "his observations with the spectroscope have demonstrated that the sun's atmosphere certainly does not contain oxygen in the state in which that gas is found in the terrestrial atmosphere." From another source we learn that Captain Abney was in the Mont Blanc district at the time, therefore it is probable that he knows something of the scientific results obtained by Dr. Janssen. The journal already mentioned says: "After an excursion to the Bosson, M. Janssen returned to the Grands Mulets, and on Sunday last reached Chamounix, where Madame and Mdlle. Janssen were anxiously awaiting his return. They had followed his perilous journey from a distance by means of powerful telescopes. His ascent of the Bosson took place on Friday. It appears the snow was in such a dangerous condition that the guides advised M. Janssen to get out of the sledge and walk. The learned astronomer attempted to complete the ascent on foot, but fell exhausted after taking a few steps."

Recently we were considering in these pages to what extent two tenants upon the same premises may be independent of each other. There is a limit to such freedom on both sides, as instanced in a case which last week attracted the attention of the Parisians. A lodger hired an apartment, and it was agreed that if ever he cooked onion soup therein he must quit; he, however, looked upon this as a joke, and a few days later had some onion soup cooked in the room. The landlord went upstairs, livid with rage, and the tenant had to go. Had there been a photographic society armed with scientific appliances at the top of the premises, it would have been in a position to send a steady flood of carbonic acid gas down the chimney, to quench the fire and close the glottis of the soup-cooking tenant. Sitting on the chimney-pot would do.

Old persons—some of them at least—are fond of talking of the good old times, and deploring the degeneration of the present age. In the main we cannot agree with them, for the advance of knowledge has been of benefit to all. But if they were to limit their remarks, and say that there was more fun going a couple of generations ago than there is now, we should be inclined to corroborate them. This is a matter-of-fact age, and the appearance of the steam engine and various other more modern devices for turning the world into a big machine has had the effect of driving away much of the genial frolic and jollity of past times. Photography has had its share in the business, and has stopped a great deal of rough fun of old type. It is difficult, for instance, for any merry fellow to take it into his head to personate any well-known character, for the simple reason that, by means of his widely-published photographs, the celebrity is well known to sight as well as to fame.

But it would seem that this does not hold good in Canada, or it may be that photographs of H.R.H. Prince George of Wales have not reached that far-off dominion. One more reason we hesitate to suggest is that the photographs which do go there may not be like the original. Whatever be the cause, it is certain that the good people of Canada were not familiar with the personal appearance of the prince, otherwise those frolicsome midshipmen would not have succeeded so well in palming off one of their number as the Queen's grandson. Although this conduct is highly reprehensible, and the young jokers are to be court-martialled for "conduct unbefitting English officers," we cannot help feeling a tickled satisfaction at the thought that there is yet some little fun abroad in the British Navy. We trust that the officers who constitute the court-martial will prepare themselves for their serious duties by reading beforehand a chapter out of Captain Marryatt, unless, indeed, after all, the affair turns out to be a clever hoax.

Of late years there have been many attempts to revive interest in that moribund instrument, the stereoscope; and, seeing that there are so many amateur photographers who are always anxious to take up a new line of work, the revival is sure to come about sooner or later. The other day we lighted upon an itinerant peep-show man at a certain seaside resort, and, remembering those wonderful shows of our childhood, with their impossible battles and burning mountains, we invested a penny, and had a peep. Imagine our disgust at finding that the pictures, instead of rivalling the modern impressionist school in their vagueness, and thus allowing you to "pay your money and take your choice" as to interpretation, were only stereoscopic views. The entire exhibition was called a "Stereorama," which is, perhaps, Latin for peep-show; and its basis was a perambulator, with a superstruction formed out of an egg-box, with holes in it through which the spectators peeped. In the interior was a paraffin lamp, which necessitated a long chimney reaching to the outside. The chimney seemed to be a great attraction to the uninitiated, who evidently regarded it as part of "the works."

At the same seaside place we came upon another application of photography in the shape of various knicknacks ornamented with small pictures of the lions of the neighbourhood—the pier, the parade, the High Street, and so on. We must presume that these mementoes of the place are purchased by somebody, or they would not be produced; but imagine the horrors of a house completely furnished with pictured memorials of this kind—glove-boxes, cotton-boxes, paper-knives, egg-boilers, egg-cups, table-napkin rings, and every other household machine capable of decoration. The vendor of the articles told us that the pictures were produced in the place and sent over to Germany, where they were affixed to the aforesaid wooden articles and varnished. Seeing that a well-made napkin-ring, after this division of labour, was sold for threepence, it is evident that the photographer is not amassing a fortune by his work.

Perhaps, taking one thing with another, it is not altogether pleasant to be a celebrity. You are not only pestered with circulars from all sorts and conditions of men, from the philanthropist down to the purveyor of coals, but you are also worried to sit for your photograph. Prince Bismarck seems to be a martyr to this kind of thing, and in a conversation with a friend he said lately that the photographers gave him no peace. This is very sad, but there is a remedy, so far as Bismarck is concerned. Some three or four years ago, a man very much like Bismarck used to sit constantly for the photographs of the German statesman. The result of this enterprise was that the counterfeit Bismarck eventually found himself imprisoned. The real Bismarck at that time did not see the necessity for a "double." What he should do now would be to find out the whereabouts of this individual, and engage him to go to the studios of the photographers who are so pertinacious. The difficulty, it is obvious, would be overcome. The photographers would be perfectly satisfied, and Bismarck would be left in peace.

What becomes of the yolks of the eggs used by the manufacturers of albumenised paper is almost as profound a mystery as what becomes of the dead donkeys. We believe that most of the manufacturers in the neighbourhood of London get rid of all they can to the confectioners, but that there is still a surplus difficult to dispose of. According to a statement in a contemporary, this difficulty ought no longer to exist, as it is said that egg-yolks are used extensively by soap makers and dyers, and that only recently hogsheads of yolks of eggs have arrived from a portion of the Russian Empire on the borders of Bessarabia. Here, it is said, are millions of hens, and that only recently has a cheap mode of carriage from this remote quarter of Europe been established. The same authority says that the "dearness and scarcity of egg-yolks have retarded the advent of many a new colour, and rendered the refined qualities of soaps almost unattainable to anybody but the aristocracy." It would be interesting to have some more information on this point, as the makers of albumenised paper would be glad to hear of a source of unlimited demand.

We understand that the American railway companies are making practical use of the automatic photographic machine. In America they have a system of what they call a "mileage ticket," which, we presume, corresponds to the season ticket of the English railway passenger. It would appear that it is a common practice for the mileage ticket to be passed round the family, so that the regulations in issuing the said ticket must be rather lax. It is now arranged that the person who takes out a season ticket must have his photograph taken by the automatic machine which is kept in the superintendent's office, and his likeness is pasted on the season ticket, so that the use is confined to its proper owner. This is about the best thing we have heard hitherto concerning the automatic photographic machine.

The conditions attached to the gift to the Harvard College Observatory of six thousand dollars, offered by Miss C. W. Bruce in aid of astronomical research, have been published. In the hope of making it the greatest benefit to science, the entire sum will be divided, and, in general, the amount devoted to a single subject will not exceed five hundred dollars. Precedence will be given to institutions and individuals whose work is already known through their publications, also to those cases which cannot otherwise be provided for, or where additional sums can be secured if a part of the cost is furnished. Applications are invited from astronomers of all countries, and should be made before October 1st, 1890, giving complete information regarding the desired objects.

SHORT FOCUS AND WIDE-ANGLE LENSES.

BY MAJOR ST. GEORGE GORE, R.E.

THIS subject is a well-worn one, and much has been said and written on it. In view, however, of the large accessions to the ranks of amateur photographers which are daily taking place, I have ventured to write this article.

There are two points of view from which the subject may be treated, which, although closely connected, are not identical; these are the length of focus of the lens with which a view is taken, and the width of angle of view included in it. For one and the same sized plate, these are, broadly speaking, inversely proportional, but it does not follow that a short-focus lens is of necessity a wide-angle lens; a 6-inch focus lens on a quarter-plate gives the same angle of view as a 12-inch focus lens on a whole plate.

The picture produced by a non-distorting lens of any given focal length is the same as that which would be formed by holding up a sheet of glass of the same size as the sensitive plate at a distance from the eye equal to the focal length of the lens, and tracing on it the outline and detail of the view in question as seen through it.

Now clearly, a picture drawn under these circumstances, if it is to represent the view as seen from that particular standpoint, would always have to be viewed from a distance equal to that at which it was held from the eye when drawn. Similarly the photograph, in order to give a true idea of the view represented, should be held at a distance from the eye equal to the focal length of the lens which produced the photograph.

Now the human eye, though no doubt an excellent optical instrument, is unfortunately not fitted with a rack and pinion to the retina, and has only a limited power of adjustment for focussing very near objects. In the case of a normal vision, if a medium size photograph, say a whole-plate print, is looked at, so as to study its detail, it will be held at from 9 to 10 inches from the eye, while if being looked at as a whole—being viewed as a picture—the natural position to hold it will be about twenty inches from the eye. It follows then that, if an effect is required which will appear true to nature, a whole-plate photograph should be taken, if possible with a lens of very much longer focal length than is usually the case, a length of 18 to 20 inches being very suitable. Were it taken with a short-focus lens, and then held at the natural distance of some 18 or 20 inches, the result would be that the perspective would appear false, and the relative proportions of objects in the foreground greatly exaggerated as compared with the distance. No hard-and-fast rule can be laid down on the subject, nor would it be advisable to do so if it could. The size of the picture influences the matter considerably; thus, in the case of a smaller picture, say a quarter-plate, it is not necessary to hold the print nearly so far from the eye in order to study its appearance as a whole, and, consequently, a proportionately shorter lens may be used, the converse being the case with photographs larger than whole-plate size.

There is another side to the question, which is far more important in its effect for good or evil than the errors induced by looking at a photograph at a distance different to the focal length of the lens it is taken with; I refer to the width of angle of view included in the picture.

Many abler pens than mine have written on this subject, your own included, Mr. Editor; but, judging from a large number of photographs one sees which sin greatly in respect of attempting to include too much, I am afraid that the lesson has not been taken to heart as generally as it should be.

The angle included in a picture may be measured, as I dare say everyone knows, by drawing a line equal in length to the longest dimension of the plate, and from its centre erecting a perpendicular equal in length to the equivalent focus of the lens. If, now, lines are drawn from the extremity of this perpendicular to the ends of the line representing the length of the plate, they will include the angle of view for that particular lens and plate.

Opticians have much to answer for in the abuse of lenses. It has become the custom with many of them to class their lenses as "half-plate," "whole-plate," and so on, without giving any information as to their focal length, and the young photographer, buying, say, a half-plate camera, naturally buys a "half-plate" lens, assuming, of course, that it is the best lens to use on that plate.

Even in the case of celebrated opticians, who, of course, advertise all particulars of their lenses, if we take, say, Dallmeyer's R. R. lens for 8½ by 6½, we find its equivalent focus to be 11 inches; this will give an angle on that sized plate rather over 42°. If, now, we turn to his wide-angle rectilinear lens, for whole-plates its equivalent focus is 5¼ inches, which gives an angle on that plate of 78°.

When we look at views in nature, the eye sees clearly only the exact point looked at, but it, at the same time, takes in generally other objects covering an angle of, perhaps, 20° to 30°. Anything beyond that angle forms no part of that picture or view as presented to our minds.

Artists, when drawing from nature, rarely include an angle of more than 20° to 30° in their picture, or, if they particularly wish to include a wider angle, they possess the power, denied to the photographer, of putting matters right by apparently narrowing the angle, which is easily done by keeping down the dimensions of objects in the foreground, and increasing the vertical dimensions of distant objects in proportion to their horizontal dimensions.

The photographer, however, seeing a pretty view, is apt to strive to get as much of it as he can on his plate. He puts on, say, a 7-inch focus lens on to his whole-plate camera so as to be sure to get the view all in, and takes his photograph, including in this case an angle of 62°.

He prints his photograph, which very probably is technically all that can be desired, and shows it complacently to his friend. The latter holds it naturally some 18 inches from his eye—where the scene which embraced 62° in nature now only subtends an angle of 26°—and wonders (though if he is wise he does not say so) what has happened to the perspective of the house in the foreground, and why it seems as if it was trying to tumble on its back, and why the distance is so minute as to be scarcely visible. If he is so bold as to criticise the picture, the author will possibly tell him that it *must* be correct in perspective, as photographs must be true.

The truth is that, as mentioned previously, the perspective of a photograph, as seen by the person looking at it, is *never* true unless the photograph is viewed from a distance equal to the focal length of the lens producing it.

Who is there that has tried photographing the snowy ranges as seen from our various hill stations, who has not been disappointed at the insignificance of the snows in the result?

Let such give up the idea of taking in a panoramic view of 50° or 60°, and use a lens of 18 or 20 inches

focal length, if their cameras will take it, on such a sized plate as will not include more than 20° or 25° of view. They will have to choose their view more carefully as it includes so little, but the result will be worth having, and the mountains will look like mountains.

As example is always better than theory, I send two photographs of the Ochterlony Monument. One was taken with a lens of $6\frac{3}{4}$ inches focus, the other with a lens of 19 inches focal length. In the former I have especially abstained from exaggerating the ease against wide-angle lenses, for I chose a point from which the monument subtended an angle from summit to base of only 28°. I might easily have gone nearer, and made the caricature much more gross by increasing the angle subtended to 40 or 50°. Notice in it how much the underside of the gallery round the summit is visible. The eye refuses to believe it is called upon to take in such a wide angle, and consequently the perspective of the tower appears false, and the mind accounts for the result by imagining the tower to be tumbling or bent away from the observer.

Then, again, look at the relative proportions of the monument and the lofty houses behind on the esplanade; the result is utterly ridiculous.

Now turn to the long-focus picture; the tower is straight, the houses behind appear to have assumed their true proportion, and the eye accepts it as a true picture.

There are occasions, of course, when the use of wide-angle lenses is quite legitimate: such are when it is essential to take the photograph of a particular object, and where the point of view is absolutely restricted to a position very near compared to the dimensions of the object. This is frequently the case with interiors, and sometimes, though rarely, with exterior views. There is nothing for it then but to use the wide-angle; but recollect that the result will certainly not be a thing of beauty.—*The Journal of the Photographic Society of India.*

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

III.—DEVELOPMENT.

THERE is a generally accepted belief among photographers that a great amount of control can be exercised in development over the density and the general gradations of a negative, and in this respect alkaline pyrogallol enjoys a special reputation On this account we have chosen this developer for the following series of experiments, except where otherwise stated. These experiments conclusively show that the only control the photographer has over development lies in securing a greater or less density of image (the former often only at the expense of fog), and that he has no control whatever over the gradations of the negative.

The plan we have adopted in carrying out these experiments is to subject *pieces of one and the same plate* to the varying conditions the influence of which, on the density or the gradation, is the subject of our investigation. A precaution we have always taken, except in our earliest experiments, is never to develop a piece of a plate which has been exposed to the light without simultaneously submitting to the same developer a piece of the same plate which has *not* been exposed, and which we term the "fog strip." The object of this precaution is to ascertain exactly how much of the resulting density is due to the action of the light, and how much is due to incidental fog, including therein fog inherent in the plate, or caused by injudicious development, and also the density due to glass and gelatine.

In the following series of experiments, made to ascertain the influence of time, of development, and composition of the developer on the density, we covered up one half of a plate and exposed the other half to a standard light, as will be presently more fully explained. After exposure, we cut up the plate in such a way that each piece includes a portion of the unexposed and a portion of the exposed plate. Each strip is then developed, such modification in time of development or composition of developer being made as forms the subject of the investigation. The resulting densities are then measured after fixing, washing, and drying.

Time of Development.

Experiment 1.—Plate: "Wratten Ord." Exposure. ?

Developer, 100 c.c. contain { 0·085 g. NH_3. / 0·400 pyrogallol. / 0·250 NH_4Br.

Results.

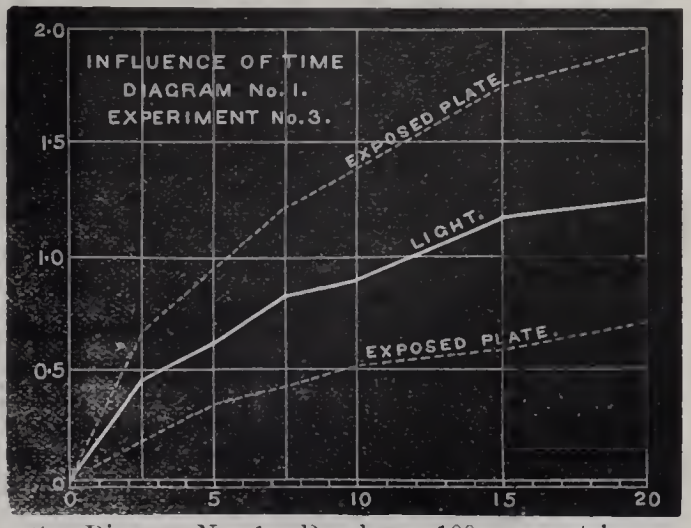
Time of development....Minutes	2·5	5·0	7·5	10·0	12·5	15·0
Densities produced	·183	·543	·793	1·160	1·10	1·17
Percentage.....	15·6	46·0	67·8	99·1	94·0	100·0

Experiment 2.—Plate: "Wratten Ord," Exposure = 60 C.M.S.

Developer, 100 c.c. contain { 0·162 NH_3. / 0·342 Pyro.* / 0·228 NH_4Br.

Time of development Minutes..	1·25	2·5	5	10	15
Density exposed plate...	·775	1·175	1·725	2·275	2·475
Density unexposed plate	·155	·270	·510	·590	·790
Density due to light....	·620	·905	1·215	1·685	1·685
Percentage developed...	36·8	53·7	72·1	100	100

Experiment 3.—Plate: "Wratten Ord." Exposure = 20 C.M.S.



See Diagram No. 1. Developer, 100 c.c. contain:—
0·162 NH_3.
0·342 Pyro.
0·228 NH_4Br.

* Continued from page 676.

* Sulpho-pyrogallol equivalent to pyro.

Time of development. Minutes	2·5	5	7·5	10	15	20
Density exposed plate	·670	·965	1·245	1·420	1·755	1·945
Density unexposed plate ...	·200	·345	·415	·505	·575	·710
Density due to light	·470	·620	·830	·915	1·180	1·235
Pecentage developed	38·0	50·2	67·2	74·1	95·5	100

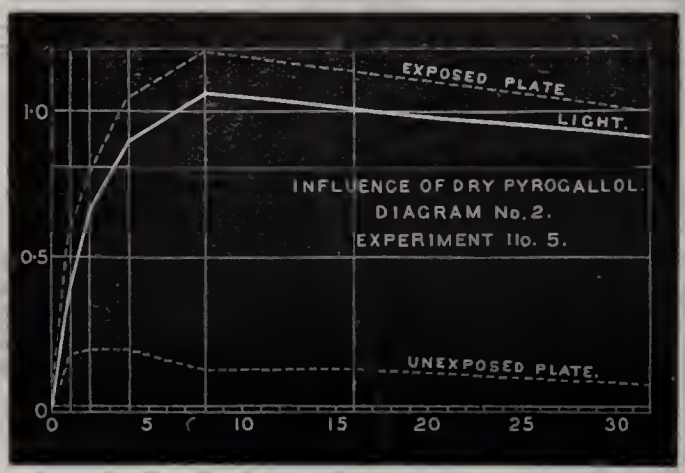
These experiments show that the total density grows with the time of development, but that the density due to light reaches a limit in about fifteen minutes. The continued growth of the total density is due to the action of the developer upon the bromide of silver which had not been affected by the light.

Variation of Pyrogallol.

Experiment 4.—Plate: "Wratten Ord." Exposure. ? Developed each strip four minutes in a developer, containing in 100 c.c. = { 0·1156 NH_3 / 0·200 NH_4Br

Pyrogallol ... grms. ...	0·08	0·16	0·32	0·64
Relative amount	1	2	4	8
Density	1·036	1·506	1·526	·500

Experiment 5.—Plate: "Wratten Ord." Exposure = 60 C.M.S. See diagram No. 2.



Developed four minutes in a developer, 100 c.c. = 0·62 NH_3 / 0·228 NH_4Br

Pyrogallol used... grms.	·057	0·111	0·228	0·457	·91	1·828
Relative amount... ...	1	2	4	8	16	32
Density exposed plate ...	·595	·840	1·060	1·215	1·156	1·040
Density unexposed plate	·180	·195	·490	·430	·137	·105
Density due to light ...	·415	·615	·870	1·085	1·015	·935

From these results we gather that an excess of pyrogallol beyond a certain limit tends to retard development and the production of density. This limit appears to be the equivalent of pyrogallol necessary to convert the ammonia into tribasic pyrogallate, $C_6H_3(ONH_4)_3$.

A similar experiment is here given, made with "sulphopyrogallol" compound, with sodium sulphite and citric acid. It will be evident that the presence of the acid, by neutralising the ammonia, is responsible for the much more marked falling off in density.

Experiment 6.—Plate "Manchester Slow." Exposure = 40 C.M.S.

Developed four minutes, 100 c.c. = { 0·162 NH_3 / 0·228 NH_4Br and "sulpho-pyrogallol" corresponding to x grms. pyrogallol.

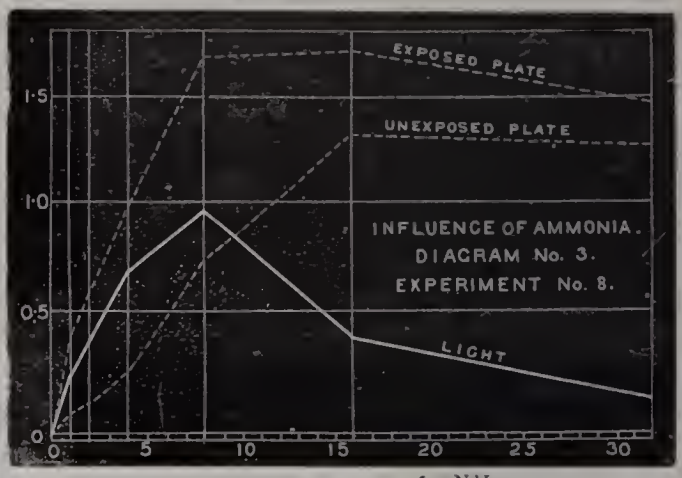
Pyro ... grms. x =	0·114	0·228	0·457	0·914	1·371	1·828
Relative amount ...	1	2	4	8	12	16
Density exposed plate...	·940	1·710	1·610	1·350	·700	·105
Density unexposed plate	·360	·660	·495	·240	·110	·80
Density due to light ...	·580	1·050	1·115	1·110	·590	·25

Variation of Ammonia.

Experiment 7.—Plate: "Wratten Ord." Exposure. ? Developed four minutes in developer, 100 c.c. = x grms. NH_3 / 0·40 Pyro. / 0·20 NH_4Br

Ammonia, grms.	0·0231	·0462	·0925	·185	·277	·370
Density ...	0·00	·613	1·276	1·816	2·136	2·266

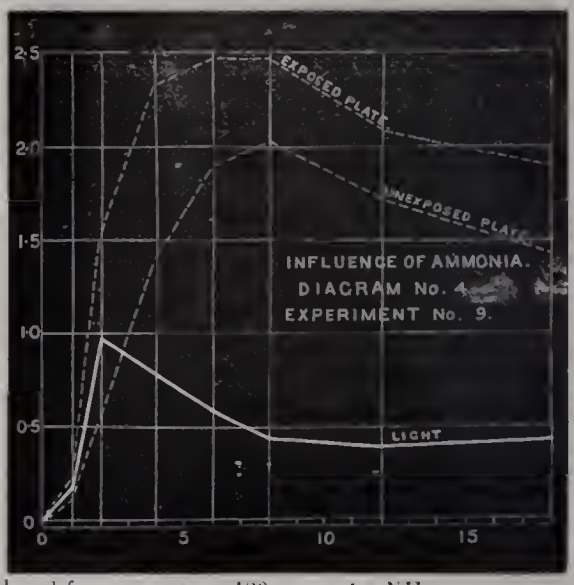
Experiment 8.—Plate: "Wratten Ord." Exposure = 20 C.M.S. See diagram No. 3.



Developed four minutes in 100 c.c. = { x NH_3 / 0·34 Pyro. / 0·23 NH_4Br.

Ammonia grms. x =	·103	·207	·414	·828	1·656	3·312
Relative amount ...	1	2	4	8	16	32
Density exposed plate...	·340	·530	·960	1·675	1·710	1·470
Density unexposed plate	·090	·120	·265	·700	1·310	1·300
Density due to light ...	·250	·410	·695	·975	·400	·170

Experiment 9.—Plate: "Manchester Slow." Exposure = 40 C.M.S. See diagram No. 4.



Developed four minutes in 100 c.c. = { x NH_3 / 0·34 Pyro. / 0·23 NH_4Br.

x grams. NH_3	·207	·414	·828	1·242	1·656	3·726
Relative amount	1	2	4	6	8	18
Density exposed plate ...	·250	1·530	2·290	2·470	2·470	1·865
Density unexposed plate...	·090	·550	1·400	1·880	2·015	1·445
Density due to light ...	·160	·980	·890	·590	·455	·420

The general result of these experiments is that the addition of ammonia, up to a certain extent, increases the density in a given time, but that the amount of ammonia which can be added without giving rise to fog, and without simultaneously adding bromide, is very limited; the so-called accelerating action of ammonia being due almost entirely to its solvent action on bromide of silver, which, if the ammonia is increased sufficiently, results in greatly diminishing the density.

The following table shows the solubility of silver bromide in very dilute ammonia, such as is used for development of plates:—

100 c.c. of dilute ammonia containing:—

1·105 grms. NH_3	dissolve	0·0376 AgBr
·555 ,,	,,	0·0206 ,,
·162 ,,	,,	0·0100 ,,
·0897 ,,	,,	0·0052 ,,

The last two solutions represent the extreme concentrations usually employed by photographers for development.

If, to any of these solutions of silver bromide in ammonia, bromide of ammonium be added, an immediate precipitate of bromide of silver is the result. The so-called accelerating action of ammonia, and the retarding action of ammonium bromide, are probably due entirely to this solvent action of the one, and the anti-solvent action of the other of these two reagents. The rapid production of fog when ammonia is increased is due to the fact that when pyrogallol solution is added to an ammoniacal solution of bromide of silver, the silver in solution is precipitated immediately in the metallic state.

(To be continued).

The Photographic Club.—The subject for discussion on Sept 10th will be "Modifying Lenses"; Sept. 17th, "Extemporised Modifications of Photographic Cameras."

The Annual Exhibition of the Photographic Society of Great Britain is to be held in the gallery of the Royal Society of Painters in Water-Colours, and will be opened by a conversazione on Saturday evening, September 27th; it will remain open until the 12th of November.

Messrs. York and Son forward their twenty-first annual supplemental catalogue of optical lantern slides and lecture sets. In issuing it they call special attention to the fact that they have been compelled to adopt a trade mark by which their productions can be recognised. The selection of new subjects includes several of aborbing interest at the present time.

War Maps.—We learnt lately of a new use for photography. The War Office authorities make reduced transparencies from their large maps, and these are supplied to the officers in charge of expeditions, and, by the aid of a small magnifying glass, these miniature pocket maps give all the detail of a large scale map on linen, which in wet or windy weather it would be impossible to use, even if it were so easy to carry.—*Scraps.*

Washing the Faces of Sitters.—The *Magic Lantern Journal* says:—"This reminds me that if sitters were to wash their faces immediately previously to having a large (head) photograph taken, there would be less work for retouchers, and a better photograph would result. An interesting comparison is that of a large head photographed immediately after sponging the face, and another taken an hour or two afterwards. The marks in the face in the latter case will appear hard compared with those in the first, for it is surprising how a lens can detect foreign matter in crevices; but for a photographer to ask his clients to wash their faces is, indeed, a difficult matter, and great delicacy would have to be displayed; but perhaps two labelled prints showing the difference would answer best, if they were hung in a prominent position in a studio dressing-room." In this matter, perhaps, something depends upon the class of sitters to be operated upon.

THE ABOLITION OF LONDON SMOKE.*

II.—*The Proposed Remedy and its Advantages.*

I shall now lay before you in broad and general lines a practical remedy which, I trust, will receive careful consideration from those whose public duty it is to be interested in this momentous question; but, before doing this, I think it will be clearer to say in this place that the progress of electric lighting cannot make much difference to the plan. For lighting purposes, no doubt, the advantages of electric light as to brilliancy, penetrating power, and cleanliness are so manifest that its use ultimately must prevail irrespective of cost, provided that it can be manipulated with less danger and trouble than it appears to be at present.

I propose that gas should be made at the coal fields, that it should be manufactured as close to the pit's mouth as convenient, that it should be conveyed from the gas works, situated in the country, up to the metropolis in suitable mains, that it should be stored in gas holders as at present, and that it should be solely utilised for heating and lighting the metropolis, together with providing all the motive power required for driving engines and machinery. By this it will be possible to obtain the extinction of all the deadly fog of London, and of all the waste already alluded to.

That this plan is not unscientific or impossible is, I think, shown by the fact that Dr. Siemens proposed in 1863 to establish separate mains in Birmingham for the distribution of heating gas, to be applied for motive purposes to small boilers and the furnaces of the small factories, and for domestic uses. At the present time, when gas engines are more commonly used, this heating gas can be used with greater advantage and economy in supplying the motive power for electric lighting purposes and other schemes which are constantly coming into operation. Siemens intended that the gas should be manufactured in the coal pit itself. His favourite suggestion was a plan which consisted in placing gas producers at the bottom of the coal mines themselves, so that, instead of raising the coal to the surface, the combustible gases ascending from the depth of the mine would acquire, by virtue of their low specific gravity, such an onward pressure that they could be conducted long distances in tubes, saving thus the cost of raising and transporting the solid fuel.

The present plan is distinguished from that of Siemens by the fact that the gas works would be placed in close proximity to convenient coal stores in suitable coal fields, and not in the pit itself. The latter method would have so many obvious disadvantages that it is unnecessary to explain why it could not be adopted.

In the gas works situated on the coal fields, in close proximity to the beds of coal, we should have one enormous advantage over the present system of works in London itself. We would dispense with the enormous amount of unsightliness, unhealthiness, and waste of available area which now occur owing to their present position and construction. The conditions which affect the quality and character of the gas would also be greatly improved. The coal used would not be exposed, as at present, to a long continuation of atmospheric changes, but could be used without much delay after being brought out of the pit. The coal at the time of its distillation would be dry and not exposed to wet, and the waste in transit would be avoided.

The production of illuminating gas from coal is a simple process, and may be considered as the rearrangement of the elementary constituents of the coal under the influence of heat. It is well known that nearly the whole ingredients of coal can be so converted. It is also well known that coal can be converted into two kinds of gases which can be easily separated, and the lower forms or qualities may well be utilised as heating gas or gas fuel, whilst the more brilliant illuminating gas can be used for the ordinary purposes of lighting. The ordinary retorts can be used for the production of both heating and lighting gas; for, during half an hour after coal gas has begun to be given off, the gas is only fit for heating purposes, whereas afterwards, for about two hours, the illuminating gas

* Continued from page 667.

comes off, and then, when further heat is applied and continued, a very large volume of gas of low illumiuating power, but of efficient heating qualities, is extracted. Under the present system this heating gas is left in the coke, or, perhaps, sent off late at night to drowsy customers who are unable to perceive or account for the differeuce in the brilliancy and quality of the light supplied to them. Both kinds of gases can be made more suitable for their distinct purposes by this division, for the illuminating gas is made richer in light-giving properties, and heating gas could, under all circumstances, be burnt without the production of soot and smoke. There is but a small proportion of the total quantity of illuminants in coal gas to the bulk of the materials dealt with, and the public could, if necessary, well afford to pay a slightly advanced price for a gas of greatly increased illuminating power, provided that heating gas at a reduced and ecouomical rate were supplied to them.

There are many inducements to the employment of gas as fuel. There is no fear of gas engiues being stopped owing to lack of water ; there is the absence of danger from boiler explosions ; no stoking is required, and the ease with which gaseous fuel can be regulated, the comparative readiness with which cleauliness can be maintained, together with its high heating power, mark out its pre-eminent advantages as a motive power in iudustrial operatious. Costly canuel gas, with its brilliaut illuminating power, is no better suited for a gas engine or for gas fires than common gas ; and, for heating purposes, a much greater yield of gas might be obtained which in burning would evolve more heat than is sought for in making illuminating gas. Having thus stated the advisability and necessity of dividing the gases, it will be seen that it will be necessary to provide two distinct sets of mains to convey the heating gas and the lightiug gas to London from the spot which would be chosen for the establishment and coustruction of the central gas works and manufactury, and I propose to refer somewhat briefly here to the question of the mains which would be required.

The leugth of mains from the coal field gas works would necessarily be 100 miles at least, and the present system of gas mains would have to be re-duplicated in order to convey the heatiug gas. If any objection is raised as to the impossibility of driviug gas through this length of main, I can point out that the various gas companies which supply the metropolitan area alone have 4,000 miles of mains, which they are constantly working. For my own part, I do not see why it would be more difficult to work the mains from the coal fields by pressure than it is at present to supply London through this enormous extent of main. Gas pipes laid through arable land, *if it is found desirable to lay them underground*, are uot harmful to the land itself, but rather do a certain amount of good, as they assist in draining the country. If the joints are made perfect, and well puddled round with clay, they will effectually prevent any possible escape of gas.

Illuminating gas suffers, to a trifling extent, by being carried long distances by the deposit of napthalene in cold weather in the pipes ; but this is again remedied in warm weather by the volatilisation of the napthalene at the higher temperature. This objection would also be reduced if we obtained a richer lighting gas by the separation of the gases. Naphthalene is a valuable product, which might, if circumstances required, be used on the same principle as the albo-carbon lights, for enriching gas near the place of consumption, or for converting the heating gas into illuminating gas. The importation of gas in main pipes in this manner would be far more economical, more cleanly, more conveuient, and more expeditious than in the present modes of conveying coal to the metropolis. If it be objected that an enormous amount of capital would be wanted to invest in the layiug down of these mains, one can only point to the capital which is sunk in rolling stock in railway labour, and in local means of the transit of coal, to show how it can be obtained.

A wonderful revolution has taken place in America and the Caspian in the transportation of petroleum through the use of what are called "pipe lines." The cost in this country of petroleum has been reduced about one-half through the introduction of this cheap means of transit from the oil wells to the coast. The first experiments of these were unsuccessful ; and the enterprise met with the most determined opposition from persons who supposed their interests would be invaded by the use of these pipe lines. At the present time, the pipe lines not only form a complete network throughout the American oil regions, but there are trunk lines which extend from the oil regions to the large cities, such as Pittsburgh, Cleveland, Buffalo, New York. These trunk lines transport the oil of large areas to those cities under a high pressure, delivering thousands of barrels daily. They are laid for miles through the forest-covered hills and valleys of northern Pennsylvania and southern New York ; across hills and rivers ; on the surface of the ground, or only slightly covered. These main lines are 6in. pipes, tested to a pressure of 2,000lbs. to the square inch, and joined with couplings into which the lengths of pipe are screwed as are ordinary gas or water pipes. The problems in hydraulics presented in the construction and management of pipe lines, particularly those lines that may be denominated trunk lines out of the oil regions, are many and intricate, and required great courage on the part of those who projected the first line to meet and surmount them. These men had only the quite different problems and experience met in laying pipes for water to guide them. These problems dealt with a homogeneous fluid, flowing through pipes laid permanently on curves of large diameter, flowing slowly under a low pressure, and delivered slowly. This water pressure seldom exceeded from 40 to 50lbs. per square inch. The "pipe line" problems dealt with a fluid varying in density with the temperature, flowing easily in the hot summers, and with difficulty in the severe winters of the country, through pipes of small diameter, laid hurriedly, and frequently changed ; often on sharp curves, or at right angles, for rapid movement and delivery ; and at high pressures, to compensate in part for the friction due to long distances, rapid transmission, and small diameter of pipe, as well as at much greater elevations than are found in water mains. The pumps which are used to keep up the necessary pressure are very powerful machines, forcing the oil rapidly through great distances and in vast quantities, not only over the hills that are encountered in the course of the line, but against the friction of the pipe conveying the oil—an element in the problem of vast importance, when it is remembered that the friction increases enormously as the flow of the oil is increased in rapidity. I need hardly point out here that, in the case of the conveyance of gas, even for long distances, the friction will be incomparably smaller than in the case of driving oil through pipe lines ; and any pressure which may be required will be produced by means of far less forcible pumps than those now in use in America for similar purposes.

It is impossible to compute or estimate accurately the vast length of the pipe lines and their connections, but it is safe to say that there are thousands and thousands of miles of pipes in use in America. These lines run everywhere, through the streets of towns, across fields and dooryards, under and over and beside roads, terminating at pumping stations, at racks, or in storage tanks. In 1879, 2,286 miles were controlled by pipe lines, 18,000,000 barrels of oil were conveyed through them, and about 250,000,000 of gallons were distributed to the manufactories in one year.

(To be continued.)

EIKONOGEN AND QUINOL DEVELOPER.—Here is the formula given by Mr. Rossignol for this developer. In 1,000 grammes of water dissolve 100 grammes of sulphite of soda, add 15 grammes of eikonogen, then 5 grammes of quinol, and finally, 50 grammes of carbonate of potash. It is better to place the carbonate in a separate bottle, and to mix, in the required proportion, at the time of using.—*Moniteur.*

ALUMINIUM MOUNTS IN AMERICA.—Many lens manufacturers are now using pure aluminium for mounting all their optical instruments. This will diminish the weight, nor can such instruments corrode. We believe it is dearer to use than brass, but on account of its many advantages would recommend it for lens mounts, corner clamps, and shutters.—*Wilson's Photographic Magazine.*

AMMONIA FORMED BY BURNING MAGNESIUM.*

BY P. L. ASLANOGLOU.

We all know that by burning metallic magnesium in contact with atmospheric air, it burns with a bright white light rich in chemically active rays, forming magnesium oxide (MgO)—the only oxide as yet known which is liberated from the metallic magnesium as a fine white powder; but there is still a portion of burnt magnesium remaining in the dish, and this is magnesium hydrate—$Mg(OH)_2$.

In November last (1889) I was experimenting with magnesium. I was burning an ounce of magnesium dust—superior quality—in an iron dish by setting fire directly to the powder; it burnt as usual, and, on cooling, I examined what remained, and found that a strong smell of ammonia proceeded from the remaining powder, magnesium hydrate. I have repeated the same experiment several times with all the different qualities or specimens of magnesium dust I could get, and they all gave the same result. I have also burnt magnesium wire, which likewise gave the same result.

From results obtained, I have concluded that magnesium burns in contact with the oxygen of the air, forming magnesium oxide; and that it also burns with the nitrogen and forms ammonia and magnesium hydrate, absorbing at the same time the aqueous vapour of the atmosphere.

$$Mg + O = MgO.$$
$$3Mg + 2N = Mg_3N_2.$$
$$Mg_3N_2 + 6H_2O = 2NH_3 + 3Mg(OH)_2.$$

It is evident, therefore, that the quantitative amount of nitrogen and aqueous vapour contained in this magnesium hydrate will vary with the different atmosphere found in different towns, countries, districts, &c.

I should think that by this experiment we could estimate the composition of the atmosphere, as its *constituents* are present in this magnesium mixture.

I have not yet made the quantitative analysis of the above experiment for the estimation of nitrogen, but the best way of estimating it would seem to be the following: By passing steam through the powder to collect the ammonia hydrate and receive it in a well-closed flask; then to precipitate it with platinum chloride, and estimate the ammonium platino-chloride precipitated. This will be sufficient to estimate the ammonia, and, consequently, also the nitrogen present, thus:—

$$H_2PtCl_6 + 2NH_3 = (NH_4)_2PtCl_6$$
$$\therefore (NH_4)_2PtCl_6 = 2NH_3.$$

N_2	= 28		
H_8	= 8		
Pt	= 197·5	=	N_2 = 28
Cl_6	= 213		H_6 = 6
	446·5	=	34

Suppose, for instance, we get by analysis 45 grms. of ammonium platino-chloride: then the amount of NH_3 contained will be—

$$446·5 : 34 :: 45 : x.$$

Six months after this experiment I was informed by an eminent authority on the science, to whom I imparted my observations, that this phenomenon had been previously observed by an American. Consequently I have hitherto doubted whether to insert it in the *Chemical News* or not; but, however, on second thoughts, I decided to send the above to the editor of the *Chemical News*, asking him to judge of my work, and to publish it or not, as he thinks advisable.

I myself have not yet seen a notice of the experiment in question in any English chemical paper; but I may have missed it, and thus have been anticipated in this record without my knowledge.

At the annual meeting of the Royal Archæological Institute recently held at Gloucester, a paper on "A Survey of Pigeon Houses in Herefordshire and Gower" was read by Mr. Alfred Watkins, of Hereford. It was fully illustrated by means of lantern photography.

* From the *Chemical News*.

THE EIKONOGEN DEVELOPER.

BY F. C. BEACH.

It is very nearly a year since this new developing agent was introduced to the photographic world; that it has rapidly grown into favour on its own merits, is attested by the increasing number of plate manufacturers who are recommending it as superior to the pyro developer, advising its use if the best results are to be obtained.

It is seldom a new developing agent is so favourably received, since it is hard to overcome prejudices in favour of old-time developers, but the advantages of eikonogen are so manifest to anyone who tries it fairly, that it frequently converts the most conservative at once.

It is an extremely simple developer, and, unlike pyro, will develop the latent image without the presence of an alkali, that is, as commonly understood, for we think it is the presence of the sodium salt in the sulphite of soda that supplies the alkali element in a small degree. It has been found, however, that a plain solution of eikonogen, without sulphite, will develop a plate.

The varied experiences of those who have given the developer a trial show that it does not work alike in all hands, which may be probably because of the different grades of preserving chemicals used. The best form of developer we have used is made with the clear, pale green crystals dissolved in a perfectly chemically pure solution of sodium sulphite; Merck's C. P. crystals is what we prefer. When mixed this gives a pale green solution, perfectly clear and very vigorous. We find this solution, if placed in a darkened room, keeps clear for a long time.

To make the stock solution, simply dissolve two ounces of sulphite of soda in forty ounces of warm distilled water, and add one ounce of eikonogen. By stirring with a rod it is soon dissolved. Where it was formerly advised to mix the alkali (carbonate of potash solution, three ounces dissolved in eight ounces of water) with the eikonogen, it is now recommended to begin the development with the simple plain eikonogen diluted one-fourth with water, until it has permeated through the film; then, after the image has started, or is too slow in coming out, add to two ounces of developer twenty minims of the alkali, or carbonate of potash solution. By pursuing this course the minimum amount of alkali introduced into the developer prevents the appearance of alkali fog, keeps the solution from getting thick, and reduces to a minimum the tendency of the plate to frill.

During the development more or less particles of the film along the edge of the plate will become detached, and if the solution is warm some of the gelatine will dissolve, which will cause the developer to thicken, perhaps, after the development of two or three plates; hence it is advisable to frequently filter it and to make good the loss by adding a little fresh eikonogen. The strength and activity of the solution is thus maintained.

When a series of plates have been developed, instead of pouring away all of the developer, some of it should be filtered and preserved in a small bottle kept tightly corked, for use in mixing with fresh developer, especially when time exposures are to be developed, since it has the same effect as the addition of a bromide—that is, aiding in producing density—without retarding the development.

A correspondent interested in the subject complains that he has difficulty in obtaining density, is troubled with frilling, and notices that the solution rapidly darkens after

use, though kept in a tight-stoppered bottle. He suggests that the first difficulty may be due to too large an amount of alkali in the developer, and the turning of the developer, possibly to an impure grade of sodium sulphite. His supposition is very nearly correct.

Want of density is sometimes due to too weak a solution of eikonogen, or in not leaving the plate in the developer long enough. The rapid change of the solution is accounted for by the use of insufficient sodium sulphite, or of a poor grade of the same.

From experiments, it has been determined that the larger the amount of sulphite in the developer, the slower it works.

It is rather interesting to note the varying quantities advised by different makers of plates. Our correspondent has gotten up a tabulated statement which shows clearly the differences alluded to, based on the ounce standard :—

	Eikonogen.	Sodium Sulphite.	Potassium Carbonate.	Sodium Carbonate.	Potassium Bromide.	Distilled Water.	Glycerine.	Potassium Ferrocyanide.	Sodium Sulphite, gr. to the oz. of solution.	Potassium Carbonate, gr. to the oz. of solution.
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.		
Formula of manufacturers of eikonogen...	1	2	$1\frac{5}{10}$		$\frac{1}{10}$	45			$17\frac{1}{2}$	$9\frac{1}{7}$
Seed Dry Plate Co. ...	1	6	$1\frac{1}{2}$			60			$43\frac{2}{3}$	$10\frac{2}{3}$
Cramer Dry Plate Works	1	$2\frac{2}{3}$	$1\frac{1}{3}$			53			22	11
Eagle Dry Plate Works, for time exposures ...	1	2	6			128			7	$20\frac{11}{56}$
Ditto, instantaneous exposures	1	2	1			30			29	$14\frac{1}{2}$
Harvard Dry Plate Works	1	2	2			80			11	11
Allen and Rowell Co.	1	4	2			80			22	11
Ditto, for instantaneous exposures	1	4	2			40			$43\frac{7}{10}$	22
Ditto, bromide paper	1	3	2			128	1		$10\frac{1}{4}$	$6\frac{13}{64}$
Ditto, lantern slides ...	1	5	1	1		128	1	$\frac{1}{2}$	17	$3\frac{1}{2}$
Ditto, average for plates, bromide paper, and lantern slides	1	$3\frac{1}{5}$	$2\frac{1}{5}$			$74\frac{1}{3}$				

Remarks.

Most of the formulas are based on 437 grains to the ounce ; taking that as a standard, and summing up the number of grains to the ounce in the six separate formulas, of the sodium sulphite and carbonate of potash, then taking their average, the amount of sodium sulphite for the eikonogen developer is found to be twenty-four grains to each ounce, and carbonate of potash eleven grains to the ounce.

No satisfactory reason is given for the unusual amount of carbonate of potash recommended in the Eagle plate formula ; experience shows that it would have a tendency to fog the plate or to frill it if the gelatine is soft.

During the hot weather of the summer eikongen crystals have been observed to change in colour from a pale, clear green to a brown-black tint, even though sealed in bottles excluded from the outer air. When dissolved such altered crystals make a dark green solution, but the power of the eikonogen does not appear to be lost ; it is only in looks that it seems to be defective. This change may be brought about by heat, but as yet no reason is advanced, except that it is known that eikonogen which has been made for some time gradually discolours. It is to be presumed that further investigation will decide what is the actual cause of the discolouration, and doubtless before many months a way will be found to prevent it.

We are informed by the manufacturers that the discolouration will be prevented or checked if the salt is emptied from the package and spread out, so that the air may have access to it. We are also advised that a dark green solution of eikonogen may be clarified by the addition of a few drops of a saturated solution of bisulphite of soda. We dissolved 480 grains of the bisulphite in two ounces of water, and ascertained that half a dram (30 minims) added to one ounce of the dark green eikonogen solution was sufficient to change the colour from green to a light red, but it did not appear to make the solution any more transparent.

Applying this altered solution to a bromide print, we were unable to develop the picture after five minutes' immersion, except to see a slight image. A few minims of carbonate of potash solution were added, then the print developed out with moderate rapidity. The colour of the developer was also altered from red to green again.

It would seem from this experiment that the addition of sufficient bisulphite of sodium to the developer to change the colour is not advantageous. That it undoubtedly shows the action was manifest. We think it may be used to advantage in mixing up the original developer, and probably one ounce will equal in preservative quality that of two of sulphite of soda.—*The American Amateur Photographer.*

THE BRITISH ASSOCIATION AT LEEDS.

THE Leeds meeting of the British Association began on Wednesday evening last, when Sir Frederick Abel delivered his presidential address, which dealt with explosives, guns, and other subjects not connected with photography.

The number of the tickets issued at the Leeds meeting to yesterday (Thursday) evening was 1,578, and this number indicates that the meeting is likely to be a medium one, with neither a particularly large nor particularly small attendance. Amongst those present at the meeting are Mr. James Glaisher (president of the Photographic Society of Great Britain), Dr. J. W. L. Glaisher (president of Section A), Lord Rayleigh (secretary to the Royal Society), Mr. C. H. Bothamley (one of the secretaries to Section B), Sir H. Trueman Wood, Mr. John Spiller (who is the guest of the ex-mayor of Leeds), Mr. Frederick Varley, Miss Varley, Mr. Tate (of Belfast), Dr. John Hall Gladstone, Professor Liveing, Sir William Thomson, Professor Rucker, Sir Henry Roscoe, Professor Meldola, Professor Rowlands (of the United States), and Mr. and Mrs. Clement-le-Neve Foster yesterday afternoon.

Lord Rayleigh read a paper in section A upon colour blindness, and some experiments which he has made with colour-blind persons by means of the late Professor Clerk Maxwell's colour top. To a particular colour-blind observer he selected a mixture of 64 parts green, and 36 parts blue appeared to be the same as a mixture of 61 parts black and 39 parts white. In another instance 82 parts red and 18 parts blue, forming together a bright crimson to normal eyesight, appeared to the colour-blind person to be the same as a mixture of 22 parts green and 78 parts black.

All the best hotels at Leeds are full, and in one of them beds are made up in the baths minus the water.

TRANSPARENT celluloid films are now supplied in white, tinted, amber, black, blue, and ruby colours. This is of advantage in some classes of work.

Patent Intelligence.

Applications for Letters Patent.

13,327. W. W. Beasley, Handsworth, Staffordshire, "Film Changing Box."—Aug. 25th.

13,381. J. M. Dow, 1, St. James's Square, Manchester, "Photographic Posing Chair."—Aug. 26th.

13,395. H. W. Taunt, 9, Broad Street, Oxford, "Frames for Photographs."—Aug. 26th.

13,455. A. G. Palmer, 128, Colmore Row, Birmingham, "Producing Photographic Vignettes."—Aug. 27th.

13,497. H. Ransom, 4, South Street, Finsbury, London, "Enlarging Apparatus."—Aug. 27th.

13,615. H. B. B. Esprut, 323, High Holborn, London, "Cameras."—Aug. 29th.

13,631. H. G. Ramsperger, 31, Southampton Buildings, London, "Roller Holders."—Aug. 29th.

Correspondence.

ARISTOTYPE PAPER.

Sir,—With reference to your note about Aristotype paper, I have used it since it first came out, and I believe there is no ready sensitised paper like it; but I have found much more satisfaction in using it since I took to the toning and fixing method given in your paper, No. 1,638, January 24th, 1890. It is quite true the paper often drops off the glass when dry; it never, by any chance, sticks to the glass. I believe the gold goes further by this plan than by any other. H. D.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Sir,—Kindly permit me to remind intending exhibitors that Monday, September 15th, is the last day for receiving "packing cases" from the country, by our agent, Mr. Bourlet, 17, Nassau Street, Middlesex Hospital; and also that the same day is the only one for receiving pictures and apparatus at the Gallery, 5a, Pall Mall East, S.W.

Any further information may be obtained from me.

Edwin Cocking, *Assistant Secretary.*

Hiding Photographic Defects.—We often find a clear spot on the negative, or some defect of figure of such proportions that we cannot touch it out with the pencil or Indian ink so that it will not show on the print. In such cases the colour is generally applied so thickly on the negative, that it will leave a clear white spot on the print; and the usual method to correct this is to go over such portions with colouring material to hide the spot or defect by shading it to match the surroundings as much as possible; but any who have tried to get a quantity of colour to adhere to the surface of albumen paper know how difficult this is to accomplish. Such white spots on the print may be discoloured by light, applied by a species of double printing, by folding a piece of opaque paper so that it will entirely cover the print, but with the ends open and the wrapper somewhat larger than the print; a hole may then be cut in this wrapper at about where the white would come when the print is enclosed—the opening to be cut as near the shape of the spot as possible. Placing the print within the wrapper, so that all parts are protected from the light excepting where the opening is made, the print may be moved from the open ends until the white spot is at the opening, and, by exposing this to subdued light, it will gradually assume the shade desired. Upon occasional inspection to note progress, it may be found necessary to move the print a little, so that all portions of the spot receive a fair share of light, and even discolouration. In this way a spot is shaded more rapidly and easily than by applying colour to the print with the brush; the result is more even, and it will not change during burnishing, as is often the case when colouring matter is freely applied. The wrapper or mask, when once properly made, answers for any number of prints from the one negative, and with but little practice the novice may soon become quite proficient at spotting out by this process.—*Photographic Herald.*

Proceedings of Societies.

London and Provincial Photographic Association.

August 28th.—F. W. Hart in the chair.

Mr. F. A. Bridge showed a finder attached to the front part of his camera. A short tube with cross-lines inside fitted to the finder directed the eye to the centre of the field. He also exhibited a substitute for a ball and socket joint. The camera is screwed to a rod about three feet long; this rod is simply put through the tripod head; by grasping the end of this rod with the right hand the camera can be placed very quickly in any position, the pneumatic ball being held in the left hand.

Mr. A. Haddon preferred using a small camera as a finder, combining a finder and a view meter in one.

The Hon. Sec. read a paper on "The Use and Abuse of Hand-Cameras."

Mr. F. A. Bridge considered that the standard of lantern slides had been considerably lowered since the introduction of the hand-camera.

The Chairman said hand-cameras were objectionable when used to photograph people in awkward positions, and many users of the hand-camera seemed constantly on the look-out for pictures of this class.

Mr. Chang showed an album of views 7½ by 5 taken by him with a hand-camera.

The Chairman passed round prints of a stand to carry twenty flash-light lamps for out-door use; the stand was made of bamboo and screw joints. He also showed photographs of a portable studio, complete with curtains and other requisites, weighing, when packed, 35 lbs.

The last outing of the season will be at Hampstead Heath, on the 20th inst. Members will meet at the Bull and Bush.

Subject for discussion on the 11th, "Carbon Printing."

Hackney Photographic Society.

At the meeting held on Thursday last Mr. Arthur Dean presided.

Several prints were shown by Messrs. Pailthorpe, Roden, and Grant. The former were taken in a hand-camera of his own construction.

The Secretary announced that Mr. Jno. Reynolds had presented an album to the Society.

Mr. Hubert then gave a paper on "Portraiture and Retouching." He thought the rivalry that existed between amateurs—or, rather, professionals—was a mistake; they must move with the times. A good photographer must be an artist. He said that he preferred graduated backgrounds even to scenic ones, which ought not to be sharply defined, or they would detract from the picture. He always judged his background from the sitter's dress. A rapid rectilinear lens could be used out-of-doors; in a room, the portrait lens was best. The amateur should, when in a garden, find out the N.E. light, screen off S.W., and, with some light material, shade off (regulatable) the top light. He demonstrated the lighting with the assistance of two members, and concluded by giving a demonstration of retouching.

Birmingham Photographic Society.

A meeting was held at the Colonnade Hotel on August 28th, Mr. W. J. Harrison, F.G.S., in the chair.

Mr. Thomason gave a *résumé* of the half-day excursion to Warwick, and Mr. Leeson of the excursion to Lichfield.

The Chairman said that Mr. Moore had kindly put on the table an interesting and complete set of photographs by the late Mrs. Julia Cameron. They were the best set he (the Chairman) had seen. Mrs. Cameron, he said, was fifty-four years of age when she took up photography, and was the forerunner of the naturalistic school. She gave long exposures, and her negatives were wholly untouched. Artists of her day admired her work—photographers did not. One of the prints—Tennyson—is still the best photograph of the poet laureate in existence.

Mr. Godfree, Mr. Stait, Mr. Rushton, and others exhibited prints taken during the Lichfield excursion.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on the 28th ultimo at the Club Rooms, 3, Lord Street, Mr. PAUL LANGE in the chair; and there was a large attendance of members.

Mr. Thomas B. Blackburn was elected a member of the Association, thus making the forty-second new member added to the Association this year.

Mr. William P. Christian exhibited a frame containing tinted lantern slides of "The Alhambra" (Granada, Spain) and some scenes of Algerian life; he also explained the process of obtaining the tones.

The Hon. Sec. (Mr. E. M. Tunstall) exhibited a photographer's new exposure table, published by T. Munson, of Kendal.

A discussion took place on Scholzig's new method of obtaining platinotype results with matt surface silver paper, and printing under green glass. Messrs. F. K. Glazebrook, John Price, William Tomkinson, and E. M. Tunstall had made some experiments with the paper, but had only obtained very indifferent results so far, not approaching the *finest platinotype* tones, as stated by Mr. Scholzig.

A negative, belonging to Mr. F. K. Glazebrook, of a view taken at Llangollen, caused considerable discussion on account of a curious fog in the centre of the plate and the reproduction of a house in the fog. The lens was a "Ross" portable symmetrical, and the plate was the only one so marked out of a dozen or so exposed that day. It was agreed, after discussion, that Mr. Glazebrook write to Messrs. Ross, sending them the lens and negative, with the hope that they might explain the matter.

Mr. J. A. SINCLAIR gave a formula of a good eikonogen developer for lantern slides, as follows:—

No. 1.

Eikonogen	½ ounce
Sulphite of soda	2 ounces
Water	20 ,,

No. 2.

Washing soda	2 ,,
Carbonate of potassium	2 ,,
Water	20 ,,

No. 1. ... ... 1 ounce } to ½ ounce water for
No. 2. ... ... ½ ,, } 8 or 10 plates.

Mr. B. Boothroyd exhibited some fine bromide prints of views secured by him in Norway on a recent trip.

Several albums were exhibited, notably two by Mr. H. Luptou in silver and platinotype, of views taken in the English Lake district and in the south of Ireland.

Various novelties were handed round, viz., an ingenious bamboo tripod; ball and socket arrangements, exhibited by Col. Ellison; and the "Baroness" half-plate camera, by Mr. Tomkinson.

AN arrangement has been made by the Berlin Meteorological Society to undertake the photographing of lightning during the coming season at different stations up and down the country.

"SCRAPS," the broadsheet printed monthly by the Britannia Works Company, and always containing useful items of practical photographic information, has now completed the first year of its existence.

THE supreme Court of Minnesota has decided that a photographer has no right to sell photographs of his sitter without that sitter's permission. This decision is now common law in the courts of many of the States in the American Union.

THE Photographic Society of Geneva has organised an Exhibition which will be open from the 15th of this month until the 15th of October. The President of the Exhibition committee is H. C. Herdinger, and the secretary is Mr. Jules Bey.

THE FRY MANUFACTURING COMPANY send a copy of their new catalogue, in the introduction to which they take the opportunity of stating that they have purchased the business of Samuel Fry and Co., Limited, and that they will carry it on under the style of the Fry Manufacturing Co., and do all in their power to largely extend and increase the concern. The catalogue is well arranged, and, like so many of the price lists now issued by leading firms, contains a large amount of useful information.

Answers to Correspondents.

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

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

F. C. C.—*Photographs of Wye Scenery.* Your best plan would be either to advertise, or collect them from local photographers on your route. Easy terms might be arranged for right of reproduction if you mention the object of your proceeding, and agree to insert the artist's name. Be careful to avoid anything which may be construed as an act of piracy, and get in all cases written permission to use the photographs in the manner desired, so that your mutual interests may be properly safeguarded.

S. M. (Yeovil).—*Leather Case for Camera.* Unless you want to practise the fatigue duty, leave your camera case behind, and be content with folding the focussing cloth around your camera, and carry it by a double strap. There is usually enough exercise to be got without needlessly adding to your impedimenta.

J. E.—*Albumenised Paper Injured by Damp.* Before rejecting it as altogether unserviceable, try a few prints by sensitising on the wrong side, and print thereon your bolder landscape subjects; or try to use it for enlargements.

W. M. A.—*Portmanteau with Ruby Glass for Plate Changing.* As already stated, we do not find any such appliance sketched in the catalogues, and doubt its superiority over a compact form of folding lamp or screen *for working by night.* In which way is the portmanteau intended to be used—as a receptacle, with sleeves and hood, for manipulation either by day or night; or as a capacious and therefore tolerably safe lantern?

EXHIBITOR.—*The Pall Mall Regulations.* Monday, 15th inst., is the last day for reception of intended exhibits, whether delivered by hand at the Gallery, or sent (in packing cases) to Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital. An entry form should be procured at once from the assistant secretary, 5A, Pall Mall East.

A. B. (Preston).—*Local Fading of Prints.* May not the circular mark seen in one of the prints be due to the fading of the mauve dye in the tinted paper by sunshine, rather than by the actual destruction of the photographic image by atmospheric exposure?

R. B. B.—*Manual of Photo-Engraving, &c.* We have received notice of the issue of a new edition of Mr. W. T. Wilkinson's book. It is now to be had of Messrs. England Brothers, 23, Charles Street, Notting Hill, W.

A. P. (Birmingham).—*Making a Vignette Direct on the Negative.* Excepting by transfer of a collodion or carbon graduated film to the face of a negative—a somewhat difficult operation—we do not know of any method of effecting the object you desire to accomplish. Can any of our correspondents oblige us by proposing a plan?

L. N.—*Magnesium Chloride from Sea Water.* A quart of sea water left to evaporate spontaneously in an open dish has given us barely an ounce of mother liquor, saturated with the chlorides of magnesium and sodium, when drained from the cubical crystals of common salt. It will be seen, therefore, that this method of preparation is, at best, a slow affair. Try a mixture of Epsom and chloride of calcium or common salt, which may be expected to furnish the chloride of magnesium by double decomposition.

M. E.—*Portable Furnace for Reducing Silver Residues.*—Usually a few bricks stacked by hand, if not built up too high, will enable you to extemporise a coke fire, or a kitchen stove may serve for small operations. Messrs. Fletcher and Co., of Warrington, offer a kerosine oil furnace, suitable for heating small crucibles in which silver residues may be reduced.

J. P. (Moss Side).—*Manufacture and Properties of Celluloid.* 1. Messrs. Carbutt and Co., The Eastman Company, and others. 2. May be softened by heat. 3. Nitro-cellulose, camphor, and sometimes castor oil.

M. D. and other Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1671.—*September* 12, 1890.

CONTENTS.

THE PRIMULINE PROCESS.

THE chief event, from a photographic point of view, connected with the meeting at Leeds of the British Association for the Advancement of Science, which closed yesterday, was a paper read last Tuesday in the Chemical Section by Mr. A. G. Green. He made known a new process, in which primuline, a recently-discovered coal-tar dye, was used to produce photographic prints of an entirely new character, and various particulars about it are published in this journal this week.

Mr. Green also gave a demonstration of the process to the Section. An enamelled iron basin contained about three pints of water kept nearly at boiling temperature by means of a Fletcher's gas burner below, and into this he projected, without weighing, a few grains of primuline, a light yellow powder, and, aided by stirring with a glass rod, it quickly dissolved. He then took a piece of white cotton cloth, perhaps 12 by 10 inches in size, and pushed it below the surface of the liquid by means of the glass rod. In one or two minutes the cloth was dyed light yellow. Then it was lifted from the liquid by the rod, and thoroughly washed in water; the surplus water was next wrung out of the cloth by hand, and the damp cloth placed upon a white backing in the printing frame, beneath a translucent, flexible coloured picture, such as used in windows in imitation of stained glass. When it is desired to obtain a print of a purple colour, the cloth, after the washing, is soaked in a mixture of a solution of nitrite of soda and acetic acid; this soaking somewhat deepens the yellow colour. The operations so far occupied five or six minutes.

The printing frame and its contents were then exposed at a window for ten minutes to rather dull daylight; there was no sunshine. The print was then developed by immersion for less than a minute in the solution described upon another page; then it was washed in water, and the whole operation would have been finished, except that in this instance, in order to fix the purple colour, which otherwise would have been liable to be acted upon by alkaline agents, it was passed through a bath of tartaric acid. The whole of the operations, from first to last, occupied about twenty minutes on a dull day; with sunshine but one minute's exposure would have been necessary, thereby reducing the total time to eleven minutes. The developer used in producing a purple colour has an evil smell.

Next a contact print, by artificial light, was made in about five minutes upon a dry plate which had been coated with a solution of primuline in gelatine. The time of exposure was five minutes to the lime light in front of an ordinary optical lantern condenser.

The colours produced by this process are not gaudy, but of an "artistic" nature, resembling those which predominate upon Indian silks. As yet a white ground to the prints has not been obtained, but a light grey, approaching to white, has been produced. For many subjects this absence of white is no drawback, because the pictures look as if intentionally coloured by hand; in fact, such power of producing colours in untouched photographs has never before been seen. One picture represented a classical head of large size against an artistic yellow background; the general result was excellent, and no one could have imagined a week ago that such a result could possibly have been produced by photography.

Numerous prints in various colours by this process were exhibited; some of them were on glass which had been coated with primuline dissolved in a solution of gelatine; others were upon paper, cloth, and various fabrics; most of them were of rather large size.

In relation to the action of the spectrum upon the new substance, Mr. Green stated that the decomposition is far more general over the whole spectrum than is the case with silver salts; although the action is greatest in the violet, it is fairly strong as far as the orange. He could not give a definite solution of the problem as to the nature of the chemical change produced by light, but could state that it is certain that nitrogen is set free; he thought it probable that some of the residue formed entered into the cellulose or gelatine vehicle; at all events, when no organic matter is present, the

decomposition produced by light is relatively excessively slow. In gelatine the nitrogen eliminated is locked up for some time, certainly for a day, and when the exposed gelatine film is placed in water, bubbles of nitrogen are given off.

Those present at the reading of the paper displayed a lively interest in its contents and in the demonstration. Mr. John Spiller, whose remarks will be found in last Wednesday's *Times*, stated that Mr. Green had not alone been the discoverer of primuline, but of the second stage of its application to photographic purposes. Mr. Spiller farther stated that he himself had been working with primuline upon paper, and had found it to be quite as sensitive to light as ordinary chloride of silver; he had tried to get an image upon it in the camera, but had obtained no result in ten minutes. The colouring matter in the finished print—say, the red colour—he believed to be wonderfully permanent; it was not affected by light, by acid, by alkali, nor by a variety of metallic salts, but was attacked by hydrosulphides. The new process, he thought, was likely to run the blue process very hard for engineers' drawings.

Among those present at the meeting was Professor Rowlands, of the United States, who has been so successful in the production of diffraction gratings. He asked whether the new substance had been tried for the orthochromatising of ordinary gelatino-bromide plates. Mr. Bothamley replied that it had never been so tried, but that only ten minutes previously Mr. Green had given him some primuline for the purpose.

In the course of this interesting meeting, Professor Thorpe, who presided, remarked that it was a curious fact that just thirty-two years ago, when the British Association was previously at Leeds, the inventor of the blue process, Sir John Herschel, occupied the chair in which he, Professor Thorpe, had just been listening to the description of a new process which Mr. Spiller had said was likely to "run the blue process hard."

So far as can be judged at present, the "running of the blue process hard" is one of the smallest things the new process is likely to do, for it gives a power never before seen of photographically producing coloured results, some of which may be artistically harmonious, and others the reverse. Ere a few months have passed away the merits and demerits of the primuline process will have been largely investigated by practical photographers, and it seems probable that some of the classes of pictures it is capable of producing will arrest the attention of the general public to an unusual extent.

Wilson's Photographic Magazine says that "Upon the completion of the new quarters of the Society of Amateur Photographers of New York, 113, West 38th Street, this Society will have the largest and most complete quarters in the world."

AMERICAN APPARATUS FOR THE FLASH LIGHT. — Take an ordinary clay pipe, wrap a piece of absorbent cotton round bowl, saturated with alcohol. Draw a piece of rubber tubing over pipe stem about a foot or so long. Weigh out magnesium powder, and place it in bowl of pipe. Focus your subject. Ignite the alcoholic cotton, and blow through the tube simultaneously. The powder will rise with an effective flash, the flame being about six inches above the bowl. Shut the eyes when blowing to prevent the mischief of sudden light shock.—*Scraps.*

HAND-CAMERAS.

A DISCUSSION recently took place before one of the societies which had for its subject "The Use and Abuse of Hand-Cameras," under which description are grouped all the various patterns of "detective" instruments which have been devised to delight the eyes of those who aspire to photography, and to vex the souls of others. The gentleman who opened this useful discussion very rightly deplored the danger which, he thinks, exists in the deterioration of picture making generally by the adoption of a system which at one fell swoop does away with tripod stand, rising-front, swing-back, and other appliances which accomplished photographers have hitherto regarded as necessary joints in their armour That the use of the hand-camera has become greatly extended during the last few months there can be no question at all; but that there is reason to suppose that its appearance has stopped the use of the older form of instrument to any important degree, or that masters of the craft are sacrificing the apparatus with which they have done so much good work, for a contrivance which, at the best, is limited in its applications, we must altogether refuse to believe.

Were it possible to take a census of those who purchase this new machine, we should, we feel certain, find that the buyers of hand-cameras are mostly those who take up photography because it is just now the fashionable craze. If the fashion had taken the form of pea-green hats, or sky-blue shoes, the hand-camera would have been left unnoticed by these butterflies of life. They care not for art, for they possess not the type of mind which can appreciate art; but they can no more afford to leave the last new craze alone than they can afford to miss the annual exhibition of the Royal Academy, or any other show or "function" to which the society fetich which they worship has set its approving seal. If they thought that the acquisition of the art involved any real trouble or the need of exertion, it would, perhaps, have been different, but the cunning dealers have met them half way, and have whispered to them, "You push the button, and we do the rest."

It is a comfortable way of acquiring a new accomplishment to dispense with any drudgery in connection with it, and photography seems to these recent aspirants to fame to be unique in the ease with which it may be learnt. "Touch the button," that is all; no need is there even for a button-hook. How different is it from acquiring the art of singing, with its practising at scales, and endless intervals—a laborious business which, after all, may end in the discovery that you have no ear. There is no royal road either to water-colour drawing, for you must know something about perspective and the theory of colour before you can paint well enough even for a charitable bazaar; but with this charming new acquirement, which is patronized by society, you merely touch a button, and somebody else is kind enough to do the rest.

It is quite evident that those who take up photography merely because they regard it as "the thing to do," will never be able to turn out good work. They

may produce a decent picture once in a way, for, as we all know, flukes are not confined to the billiard table, but the majority of the plates or films which they expose by the touch of that magic button are, in the nature of things, predestined to failure. The touch of the button—which they look upon as the chief, if not the only manipulation necessary—is in reality the last of a series of important operations, and the only one which is simply mechanical in its nature. The first operation is to *see* a picture in that which lies before us, and the number of those who have no eyes for such things is far greater than those who lack ears to guide them in singing a melody correctly. Then come the questions of distance, sufficiency of light, to say nothing of the knack of holding the camera level, and pointed in the right direction to include the required subject. To the thoughtless buyer of the touch-button contrivance these are simple things to surmount, and it will not be until someone else has "done the rest" that he will find out his error. He takes no heed of anything beyond the mere mechanical part. He sees something which he fancies will give him a first-class picture—an open landscape, a grove of trees thick with shadows, or even the interior of a room, it does not matter which—all is the same to him; he merely has to press the button. Then the plates or films are sent to the dealer, who must do his best to coax an image out of them, or to satisfy his customer that there is no image there to coax.

There is no doubt that this new type of photographic worker—or, rather, player—has been born of the hand-camera, and, while we feel inclined to smile at him, as we did last year when, from the same laudable motive, he took to banjo playing, we must acknowledge that he is harmless, and is, to some extent, serviceable. He will not, it is true, advance the progress of photography one jot, nor will he produce any picture worth looking at. His self-imposed task will not give birth in his mind to any fresh ideas; but he will spend money on his transient hobby, and in that way he will do good. So let them play at being photographers, and spend their money on apparatus as freely as they like. The hand-camera is not a dangerous weapon like the revolver, for if the shots do not hit the target, they do not go astray. In the meantime, the real workers will keep to their old ways, although they are ready enough to acknowledge the great value of a hand-camera when used with knowledge and discretion.

Portraiture by the Magnesium Light.—To Professor Schirm, of Berlin, belongs, we believe, the honour of re-establishing the practice of portrait photography by the magnesium light exclusively. Not only are all the negatives taken with this light, but the printing and copying are also done by the same means. The Professor uses Voigtlander's Euryscope lenses, and for printing, the chloride paper of Dr. Just, of Vienna. Last winter Professor Schirm attended a fancy dress ball, and between 9 p.m. and 5 a.m. secured no less than 318 pictures, some on orthochromatic plates, with yellow screens, all by means of the flash-light. All who have seen this collection pronounce the photographs most admirable. In consequence of this success, flash-light photography is rapidly becoming a feature in many of the studios of Berlin.—*Wilson's Photographic Magazine.*

BRITISH ASSOCIATION NOTES.

The Opening Meeting.

At the opening meeting of the British Association at Leeds on Wednesday, last week, and after the reading of the presidential address by Sir Frederick Abel, the Marquis of Ripon moved a vote of thanks to the president, which was seconded by Sir Frederick Bramwell. Mr. Emsley, the Mayor of Leeds, in "putting" the motion to the meeting, gave the Association a few words of welcome to the town in the usual Yorkshire highly hospitable fashion, and added that it was thirty-two years since the previous meeting of the British Association at Leeds, and that he had recently been looking over the list of names of those who then attended. He wondered that many of those names had not been commemorated by statues; but perhaps, as Cato observed, it was better that people should ask why there was no statue than why the statue existed. From this we infer that the Mayor is an amateur photographer, who had been reading Mr. Mew's remarks about the statue to Daguerre, published in these pages two or three weeks ago.

Geological Photography.

At a meeting of the General Committee of the Association, which had been held a few hours before the opening meeting, Sir Douglas Galton, the Secretary, read the report of the Council; then the report of the Corresponding Societies Committee was read, in which a little attention was paid to geological photography. It set forth that Professor Lebour had stated at the meeting at Newcastle last year that Section C, since the first conference, had had this matter referred to them for consideration, and he might say there was the greatest possible unanimity when it was brought up. The subject was one which all geologists would agree was a most useful one. Mr. Jeffs, as a member of Section C, explained the system which he and Mr. Adamson had so far adopted; the method was regarded as no doubt a good one, but the whole question of detail was left to the committee to report upon. He might say that it had been passed on to the Committee of Recommendations that same day. It was taken up by the president, Professor James Geikie, and was provisionally passed, he believed, without any opposition. The members of the committee were Professor Geikie (as Chairman), Professor Bonney, Mr. A. S. Reid, Mr. S. A. Adamson, Professor Boyd Dawkins, Mr. W. Gray, and Mr. Jeffs as secretary. He thought they would see that the committee was chosen with some thought as representing different parts of the country, so that a considerable area would be covered, and the different features of the various districts would not be overlooked. The committee was not only appointed to do the work of collecting, preserving, and registering in a systematic way the photographs of places of geological interest, geological sections, and so on, but he thought in the first instance it was chiefly for the purpose of seeing how the work could best be carried on in the future. One of the most important points they would have to consider was where the

photographs, when once obtained, were to be lodged and preserved in safety for consultation. He hoped hat they would hear to-morrow that the proposal had passed the Committee of Recommendations, and had become an actual committee of the British Association. A grant of £10 had been asked for at the same time.

The committee was subsequently appointed, and last week Professor Meldola became its secretary.

About the relations of photography to geological science we shall have more to say hereafter.

A NEW USE FOR COLLODION.

Last Monday Professor John Berry Haycroft communicated to the chemical Section a paper on "The Structure of Muscular Fibre as demonstrated by Castings taken in Collodion." The author, according to the official abstract of his memoir, had published ten years ago the results of an experimental research which showed that the cross striping of a muscle depended on the moniliform shape of the muscle fibrils, and not upon their fracture. It occurred to him some months since that the point could be definitely settled if castings could be made of muscular fibres. If the casts should exhibit the microscopical appearances of the muscle, then these appearances could only be due to its form. He had tried a great many methods in vain, but had at length devised a way of stamping moist collodion with the fibres. A drop of collodion was placed upon a glass slide, and, before it was quite dry, some muscle fibres were pressed upon it with the finger tip. These were then removed, and the film, being examined with the microscope, was seen to be covered by exquisite impressions of the fibre. One could see every stripe clearly and sharply defined, even those which were most minute and difficult to recognise in the actual muscle. Some of those were so minute in width as not to measure the twenty-thousandth part of an inch across. When the collodion dried, the film shrank owing to its surface tension, and the little impressions all disappeared. Here, of course, one was only dealing with the surface form, and it was clear there was absolutely no structure, and the proof of the author's views was complete. The castings showed the microscopical appearance of the fibre in whatever stage of contraction or relaxation it might happen to be, so that the inhibition theories of the German authors had to be discarded, as they were all founded on the fact that the stripes changed during contraction in size and arrangement, this change being due not to any enlargement or diminution in the size of actual structures, but, as the "casts" demonstrated, to an alteration in external form, and therefore of optical appearance of the fibrils themselves.

DR. GLAISHER AT THE BRITISH ASSOCIATION.

Mr. James Glaisher, president of the Photographic Society, is so respected in photographic circles from the large part of a life-time he has devoted to its interests, that it is pleasing to know that his son, Dr. J. W. L. Glaisher, has been steadily rising in influence in the scientific world, having been in the past the president of the Mathematical and some other London Societies, and at the recent British Association at Leeds he was president of Section A, Mathematical and Physical Science. Lord Rayleigh spoke in high terms of his opening address to the Section, and last Wednesday, at the close of the whole proceedings, Sir William Thomson said that he had never seen a president of the Section who had devoted himself more assiduously to the duties of his office. This characteristic seems to be hereditary in the family.

Last Saturday one of the British Association excursions was to the ancient town of Pontefract. The Castle and other archæological objects of interest were well explored by the visitors, who numbered 150, with Dr. J. W. L. Glaisher at their head; at least, upon him, as the only president of a section present with the party, fell the duty of returning thanks to the Mayor and Corporation, also to Mr., Mrs., and Miss Tew, and others, for their hospitality. Mr. Tew, in the course of a speech from the head of the table, remarked that the Association visitors had been also welcomed by the ancient Corporation of Pontefract, and by its Mayor, who had been in existence since the days of Richard III. Mr. John Rhodes, the Mayor, fixed his eyes on the mace and shook his head at this remark; he appeared to think that his age had been rather over-stated.

Pontefract thrives upon the curious industry of liquorice growing and liquorice preparing. The liquorice plant is a shrub with acacia-like leaves, and it takes three or four years to arrive at maturity. It sends its long tap roots about six feet deep into a soft, sandy soil, containing iron; as the root cannot be pulled up, it has to be dug out of its deep bed.

Miss Mene Muriel Dowie accompanied this excursion. Her paper entitled, "Notes on a Journey in the Carpathians and Ruthenia," created a great sensation, and was described by some of the Leeds daily newspapers as the best of those delivered at the British Association meeting in that town.

THE NEW PHOTOGRAPHIC PROCESS.

Mr. John Spiller exhibited last Tuesday, in the Chemical Section, some prints he had produced upon paper by the primuline process; their colours much resembled those of different varieties of sea-weeds, and it seems likely that the power is now placed in the hands of botanists of obtaining direct photographic prints of selected seaweeds in something approaching the natural monochromatic colour of each of them. No prints on fabrics were shown at the meeting in which the primuline pictures had been kept well on the surface by the use of a substratum.

FUTURE BRITISH ASSOCIATION MEETINGS.—Next year the British Association will meet at Cardiff, under the presidency of Dr. William Huggins. In 1892 it will meet in Edinburgh. The severity of its last reception there was publicly notorious; perhaps it arose from local dissentions, and 1892 may show that Edinburgh is not inferior to Glasgow in hospitality. Mr. Atchison, the much-liked secretary to the British Association, has been obliged to resign because of bad health, and this responsible position will henceforth be occupied by Mr. George Griffith, of Harrow, who was secretary to it for a long course of years, and knows its inmost workings. He is exceedingly popular with the members.

PHOTOGRAPHS OF THE INVISIBLE IN SOLAR SPECTROSCOPY.*

BY C. PIAZZI SMYTH, LL.D.

The photographs submitted on this occasion are two, each of them murally mounted, and measuring forty inches long by twenty inches high. They represent in reality only very small portions of the faint ultra-violet of the solar spectrum, but on a whole scale of fifty-seven feet long from red to violet, and are located quite outside the spectral limits of visibility to the human eye with the grating spectroscope concerned, whether under summer or winter sun.

Yet the previous empty fields of ultra-violet view became filled with wondrous detail as soon as they were entrusted for record to actinism and the photographic film. This, too, in dull winter weather, with a lamentably low sun on December 12th, 1889, or "where the eye could see only less than nothing."

Some degree of power in photography to record farther into the spectrum than the human eye has long been well known; but in this instance there had been supposed proof obtained of the positive incapacity of the metallic substance of the grating to reflect the ultra-violet or even violet light, yet here this accusation was shown to be false the moment photography was applied, and powerful pictures have been procured thereby, as witness these enlargements by Mr. S. H. Fry, at Kingston-on-Thames, from the author's original negatives on glass.

The definition is not indeed yet what the author desires, but he expects soon to make it so by the aid of a contribution lately received from the Government Grant Committee of the Royal Society, so that then, having a sufficient supply of electricity already on the premises, he may be able to photograph a more crucially telling comparison between certain earthly elements and the solar spectrum lines than has yet been accomplished, if, indeed, the present meeting will graciously extend to him, among their many annual votes for the promotion of science, a sufficient one for carrying on an end-on-gas-vacuum tube method of photographing, which is alone suitable to high spectroscopy.

THE BRITISH ASSOCIATION COMMITTEE ON GEOLOGICAL PHOTOGRAPHS.

The following is the report of the above Committee read last Tuesday, which Committee consists of Professor James Geikie (Chairman), Mr. S. A. Adamson, Professor T. G. Bonney, Professor W. Boyd Dawkins, Mr. William Gray, Mr. Arthur S. Reid, and Mr. Osmund W. Jeffs (Secretary), to arrange for the collection, preservation, and systematic registration of photographs of geological interest in the United Kingdom. (Drawn up by the Secretary.)

Your Committee have much pleasure in presenting the annexed list of geological photographs obtained as the result of their first year's operations.

In the report of the Corresponding Societies' Committee presented to the Newcastle meeting (1889), lengthened reference was made to a proposal by the Committee of Section C for the systematic collection and registration of geological photographs, following upon a suggestion contained in a paper read before the section at Bath by Mr. Jeffs. The subject was discussed several times by the delegates, many of whom contributed examples of such geological photographs as had been taken before any scheme to secure uniformity of action was mooted. Important suggestions were also offered as to the arrangements to be made to carry out the objects stated, but the details were ultimately left in the hands of the present Committee, the appointment of which was sanctioned at the Newcastle meeting.

In commencing operations, your Committee issued a circular inviting the co-operation of geological societies, field clubs, photographers, and all others interested in supplying them with the following information, viz. :—

1. Lists and details of photographs taken illustrating localities and sections.

2. Names of local societies, or persons, who may be willing to further the objects of the Committee in their own district.

3. Particulars of new localities, sections, boulders, or other features which it may be desirable to have photographed.

It was added that :—

"The Committee will also be glad to receive a copy of the print from each negative, which will be exhibited at the succeeding meetings of the Association and afterwards preserved for reference. It is thus hoped to form, eventually, a national collection of photographic views illustrating the geology of our country, and deposited in a centre where the collection will be available for purposes of study and comparison."

In order to secure uniformity of action, and as a guide to those willing to assist, a circular of instructions was issued embodying those points which were thought to be most desirable in effecting the objects of the Committee. The details given were drawn up after very careful consideration and consultation with practical photographers, and were so framed as to be applicable to most of the conditions to be met with in photographing the different classes of objects having geological interest worthy of permanent record.

The following is a copy of this circular, which is given here for convenience of reference.

[Circular No. 2.]

[Reduced Copy of Form A.]

Form A.	BRITISH ASSOCIATION COMMITTEE ON GEOLOGICAL PHOTOGRAPHS.	No. of Photo.*
County of	Photographed under the direction of Society.	
Name and position of Locality or Section.		
Special features shown.		
Details of Section.	Height / Length	Compass Direction.
	'In shade,' or 'direct light.' Time: a.m. p.m.	
Sketch, or other particulars, if nece-sary, may be given here :—		
Name of Photographer / Address	Date photographed	Registered No.

* This number should also be placed on the back of the Photograph.

Instructions for the Collection of Geological Photographs.

Photographs are desired illustrative of characteristic rock-sections, especially those of a typical character or temporary nature; railway cuttings; important boulders; localities affected by denudation, or where physiographical changes are in operation; raised beaches; old sea-cliffs; coast scenery and

* An abstract read at Section A of the British Association last Monday.

coast erosion; characteristic river-valleys, escarpments, and other landscape features; glacial phenomena, such as *roches moutonnèes*, moraines, drums, and kames, and natural views of geological interest.

1. The views should be taken under skilled geological direction, and in every case the most typical views should be secured in preference to general views. It may be convenient for societies to form a small committee for the purpose of noting suitable sections desirable to be photographed, and arranging such work as may be possible in each district. To this end it is anticipated that the services of many amateur photographers may be usefully brought into requisition.

2. Size of photograph recommended: 8½ by 6½ inches (whole plate). (In view of the difficulty of carrying a heavy camera and plates, it is not desired to exclude smaller views when these are well-defined and clear. The size, therefore, is optional.)

The views should be printed by a permanent process whenever practicable.

3. It is necessary, in order to preserve its scientific value, that each photograph should be accompanied by the following details, which may be given on forms supplied as per copy, and attached loosely to the photograph (not *fastened* on the back):—

(*a*) Name and position of section or locality.

(*b*) Special feature shown, with illustrative diagrams, when necessary. (Details may be given, if more convenient, on a separate tracing attached to the photograph.)

(*c*) Height and length of section, and compass direction.

(*d*) Name of photographer, and society under whose direction the view is taken.

(*e*) Date when photographed.

(*f*) Indication of direction of light and shade; *i.e.*, state whether taken in "direct light" or "in shade."

4. Each photograph sent in for registration should bear a *local* number, and the accompanying form should be numbered in accordance therewith.

5. Lists of photographs, copies of photographic prints, and the information relative thereto should be sent under cover to the Secretary to the Committee, *at the earliest possible date*, as the work of registration will be heavy.

The offers of help received in response to this circular were very numerous, and if all who had promised to send in copies of photographs had fulfilled their intention, the Committee would have been enabled to issue a much more extended list. As it is, the number of photographs sent in up to the end of July reached a total of 196, a result which, taking into consideration the difficulties incident to a first year's working, the Committee feel is an encouragement to persevere in their efforts, if permitted to do so, until an adequately complete series of photographs is obtained. It will be seen from the list appended that a large majority of the English counties, besides those of Scotland and Ireland, are as yet almost entirely unrepresented, and that, in the case of counties from which photographs have been received, the views taken have been confined to limited areas. Prior to the institution of this Committee, there has been little effort made to arrange for the systematic photography of local geological sections, although much has been accomplished in an irregular manner by individual workers. It has been difficult to obtain all the particulars desired of these earlier photographs, but it is believed that the more important of them, at any rate, are included in the list attached to this report. Acknowledgment is due to those societies (among which may be mentioned the Belfast Naturalists' Field Club, Chester Society of Natural Science, Croydon Microscopical and Natural History Society, Essex Field Club, Leicester Literary and Philosophical Society, Liverpool Geological Society, and the Yorkshire Geological and Polytechnic Society) for the care they had taken to preserve photographic records of important and interesting sections.

While a fairly large number of photographs has been obtained in response to the circular issued by the Committee, but little has been accomplished in the way of establishing county photographic surveys for geological purposes. It was hoped that the suggestion in circular No. 2 as to the formation of special local committees in different centres (the only satisfactory means of doing the work thoroughly) would have been more widely adopted. The only county which has so far undertaken such systematic work is Yorkshire. In this county, that valuable aid to scientific progress, the "Yorkshire Naturalists' Union," has already aided the work of the British Association by the establishment of local committees charged with special objects of research. As soon as possible a geological photographic section was formed, of which Mr. James W. Davis was appointed chairman, and Mr. James E. Bedford secretary. This section has sent over a hundred copies of photographic prints, with descriptions, the work of its members in the county of York, besides other localities further afield. This Committee are much indebted to the officers of the Yorkshire Geological Photographic Section for their valuable assistance.

There are not wanting indications also of the ripening of the scheme in other directions at an early date.

Mr. J. Hopkinson, of St. Albans, read a paper before the Hertfordshire Natural History Society on "Scientific Investigations in Hertfordshire in connection with the British Association," in which he pointed out several geological features in the county worthy of being photographed, and urged the formation of a local collection of geological views, to be commenced during the summer of 1890.

An important proposal was brought before the Photographic Society of Birmingham by Mr. W. Jerome Harrison, who advocated a photographic survey of the county of Warwick, to include pictorial, architectural, besides antiquarian and scientific subjects; and alluded specially to the work of this Committee.

Interest in the work of the Committee has been manifested abroad as well as in this country. Letters have been received from several foreign professors of geology asking for information and details of the scheme, and offering, in some cases, an exchange of photographs. Professor E. Reyer (of Vienna), Dr. A. Leppla (of Berlin), and Dr. G. Dewalque (of Liege), have each specially interested themselves in the objects of this Committee. Professor J. F. Kemp (of Cornell University, Ithaca, New York State, U.S.A.) has also taken steps to bring the subject before the Geological Society of America, with the view to the inauguration of a similar scheme in America.

The Committee regard it as highly important that as many photographs of sections, &c., should be taken as possible. Of these a careful selection of the most typical views should be made to be sent in for registration. During the first year *all* views sent in have been registered, but in future it will be necessary to make a selection of those most suitable, otherwise there will be an accumulation of photographs illustrating the same section or natural feature.

It has been found quite impracticable to restrict photographers to any special size of print; it is, therefore, merely recommended that the plate should be as large as possible, the "whole-plate" size (8½ by 6½ inches) being the most suitable.

Your Committee have not yet had an opportunity of fully discussing the question of the ultimate disposition of the photographs, and it has been thought advisable to defer a recommendation of this nature until a more complete series of photographs has been obtained.

Meantime, a suggestion has been made by Mr. Willem S. Logeman, principal of Newton School, Rock Ferry, that a volume of selected photographs illustrating typical geological features should be published, which would form a useful book of reference for educational purposes. At present the collection of photographs is not of sufficient proportions to warrant the reproduction of a really complete series of views from nature, such as it would be of advantage to students and others to possess; but the Committee are bearing in mind the suggestion for possible use in the future, should they see their way to recommend its adoption.

It is with great regret that the Committee have to record the decease of Mr. S. A. Adamson, who was a most active member, and to whose exertions and influence the progress of the work in Yorkshire is largely due.

The Committee desire to express their obligations to Mr. A. Norman Tate, editor of *Research*, for the loan of a block for the purpose of illustrating their circular of instructions.

The work of the Committee having been, so far, of a preliminary nature, they would respectfully solicit their re-appointment, in order to arrange for the further completion of the objects for which they were appointed, with a renewal of the grant of ten pounds.

(*To be continued.*)

Mr. J. SOLOMON, well-known as one of the earliest among English photographic dealers, died at the age of eighty-seven, on the 2nd of September, in New York, where he has been resident for the past nine years.

COPYING TRACINGS, BLACK LINES ON WHITE GROUND.—Cola's process, which gives a black line on a white ground, is now greatly in use for copying tracings. It prints quickly, and is very simple to work. The exposure ranges from five to ten minutes in the sunlight, and from twenty to forty minutes in the shade. I find the best results are got on a bright day, and printing in the strongest light. I have very often to reduce large drawings, made on yellow tracing paper to a small scale, to transfer to a stone for lithographic purposes, and use this process to get a more suitable copy to photograph from. To make a print, you put the tracing face downwards in the printing frame, and place the sensitive paper on the top of it, then a piece of thick felt, and then the backs, and put a good pressure on by means of screws, which are much better than springs, as you are able to get a more even pressure. To ascertain if sufficiently printed, lift up one corner, and if the greenish-yellow tint has disappeared, except where covered by the lines, it should be taken out and immersed, face upward, in a bath composed of gallic acid 20 parts, alcohol (methylated) 200 parts, and water 1,000 parts, and remain for three minutes, at end of which time the lines will be up strong and black. It should then be thoroughly washed in running water for a quarter of an hour, and the surface rubbed with a soft sponge, then taken out and hung up to dry. The following will be found a good formula for sensitising the paper:—

Water	300 parts
Gelatine	10 ,,
Perchloride of iron	20 ,,
Tartaric acid	10 ,,
Persulphate of zinc	10 ,,

Apply this by means of either a broad, flat camel-hair brush, or a fine sponge, to a hard, well-sized paper, then hang up to dry in a dark room. To over-expose a print means losing the lines, and under-exposure gives a very dirty, neutral tint ground and very faint lines.—*Scientific American.*

A NEW PHOTOGRAPHIC PRINTING PROCESS.*

BY ARTHUR G. GREEN, CHARLES F. CROSS, AND EDWARD J. BEVAN.

IN the early part of 1887 one of us (Green) discovered that, by heating paratoluidine (2 mols.) with sulphur (4 to 5 atoms) at 200°-300° C., a very complex amido base was obtained which, on treatment with fuming sulphuric at a low temperature, was converted into a sulphonic acid, the alkaline salts of which were easily soluble in water, and had the peculiar property of dyeing cotton primrose yellow from an alkaline or neutral bath without the use of a mordant. Further, the amido compound thus fixed upon the fibre could be diazotised *in situ* by passing the material through a weak solution of nitrous acid, and, when diazotised, could be combined with various phenols and amines, thus producing a variety of different colours, which, being formed within the fibre, were all distinguished by great fastness to washing. The soluble amido sulphonic acid was named "Primuline" by its discoverer, and has found a very extensive employment in cotton dyeing; the colours produced from it within the fibre were called "Ingrain colours."†

Although the chemical constitution of primuline base (of which primuline is the mono-sulphonic acid) has not yet been determined with certainty, there is no doubt that it is a condensed derivative of dehydrothiotoluidine, a body which always accompanies it in its formation, and that it differs from the latter in exactly the same way as dehydrothiotoluidine itself differs from para-toluidine. As there is scarcely any doubt that dehydrothiotoluidine has the formula—

$$C_6H_3(CH_3)<\overset{S}{N}>C.C_6H_4(NH_2)$$

i.e., is an amido-benzenyl-amido-thiocresol, it follows that the formula of primuline, or rather, of its chief constituent, is‡ probably

$$C_6H_3(CH_3)<\overset{S}{N}>C.C_6H_3<\overset{S}{N}>C.C_6H_3(NH_2)<\overset{S}{N}>C.C_6H_3(SO_3Na)$$

In a similar manner, by heating meta-xylidine or pseudo-cumidine with sulphur, homologues of primuline are obtained, which, like primuline itself, dye cotton without a mordant, and can be diazotised and combined with phenols within the fibre.

It has been long observed by one of us (Green) that the diazo compound of primuline was very sensitive to the action of light, being readily decomposed thereby, and losing its property of combining with phenols and amines. Upon this fact we have now founded a photographic process, by means of which designs can be produced in fast colours upon cotton, silk, wool, linen, or other fabrics. It can also be applied to wool, xyloidine, celluloid, paper, or to gelatine films upon glass, thus affording a very wide range of employment. The process, which is a very simple one, merely depends upon the fact that if a material containing diazotised primuline be exposed to light under a design, those parts which are acted upon by light will be decomposed, whilst the parts protected from the light will remain unaltered, and consequently, on subsequent development with a phenol or amine, will produce colours, whilst the decomposed por-

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* Read at Section B, British Association. The full title of the paper was, "The Action of Light upon the Diazo Compounds of Primuline and Dehydrothiotoluidine: a Method of Photographic Dyeing and Printing."

† A. G. Green, *Journ. Soc. Chem. Ind.*, 1888, p. 179.

‡ A. G. Green, *Journ. Chem. Soc.*, 1889, p. 227; *Ber.* 22, 968; P. Jacobsen, *Ber.* 22, 330; L. Gattermann, *Ber.* 22, 422; W. Pfitzinger and L. Gattermann, *Ber.* 22, 1063.

tions will not. The details will, of course, depend somewhat upon the material to be treated. As an instance, we may take the production of a design upon cotton cloth, cotton velveteen, and so on. The material is first dyed with primuline from a hot bath containing common salt until the required depth is obtained. It is then washed and diazotised by being immersed for a quarter of a minute in a cold bath containing about ¼ per cent. of sodium nitrite, and strongly acidified with sulphuric or hydrochloric acid. The material is washed again, and exposed damp—or, if preferred, after having been dried in the dark—to the action of light beneath leaves, ferns, flowers, or other natural objects, or beneath glass or transparent paper upon which may be painted or printed any design which it is required to copy. Either the arc electric light or daylight may be employed; in the latter case, the time of exposure will, of course, vary with the intensity of the light—under half a minute is required in bright sunshine, and nearly half an hour in very dark, cloudy weather. When the decomposition is complete, which may be readily ascertained by means of a test slip exposed simultaneously, the material is removed from the light, and either passed into the developing bath at once, or is kept in the dark until it is convenient to develop it. The developing bath consists of a weak solution (¼ to ½ per cent.) of a phenol or amine made suitably alkaline or acid, the phenol or amine employed depending upon the colour in which it is required to produce the design, thus:—

For *red*, an alkaline solution of β-naphthol.
„ *maroon*, an alkaline solution of β-naphthol-di-sulphonic acid.
„ *yellow*, an alkaline solution of phenol.
„ *orange*, an alkaline solution of resorcin.
„ *brown*, a solution of phenylene diamine hydrochloride.
„ *purple*, a solution of α-naphthylamine hydrochloride.

If it is required to produce the design in two or more colours, the respective developers, suitably thickened with starch, may be applied locally by means of a brush or pad. After development the material is thoroughly washed, and requires no further fixing.

Linen, silk, and wool are treated in exactly the same way. Paper for copying drawings, and other purposes, is coated on the surface with primuline by means of a brush or roller. For the production of gelatine films upon glass the primuline is incorporated with the gelatine before being applied to the glass.

In place of ordinary primuline the homologues already mentioned may be used. For silk and wool the primuline may be replaced by dehydrothiotoluidine-sulphonic acid, by means of which colourless backgrounds may be obtained.

Concerning the reaction which occurs when the diazo-primuline or the diazo-dehydrothiotoluidine is decomposed by light, we cannot at present say anything definite, except that the diazo group is completely destroyed, for on treatment with sodium hydrosulphite (true hyposulphite) it cannot be converted into the amido group (re-forming primuline or dehydrothiotoluidine). The reaction may consist in a replacement of the N_2 group by OH or by H, or may be even more complex. Although we cannot affirm that this reaction to light is a property of the diazo-compounds of this group of bodies only, yet it is certain that they possess an extreme susceptibility to light far greater than that of other diazo-compounds, whilst, at the same time, they are far more stable to heat. It is thus possible that this property may depend in some way upon the sulphur which they contain.

THE BRITISH ASSOCIATION.

CHEMICAL SECTION.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.

THE President, Professor T. E. Thorpe, formerly of the Yorkshire College, Leeds, and now of the Normal School of Science, South Kensington, is himself a photographer of very considerable ability, and whilst at Leeds was for some time President of the Leeds Photographic Society, which made considerable progress during his term of office. Some years ago Professor Thorpe produced a very fine series of more than 100 whole-plate negatives, illustrating the scenery, &c., of the Azores, and he has done valuable photographic and photometric work on several eclipse expeditions. The presidential address dealt mainly with the parts played by Priestley and Lavoisier in the early development of modern chemistry.

A very small proportion of the papers read before this section dealt with photo-chemical or photographic subjects. Dr. A. Richardson read a further interim report of a committee appointed two or three years ago to investigate the oxidation of the hydracids of the halogens in presence of sunlight. The results obtained, so far, are not of a very definite character, and are not altogether in agreement with those of other observers; but any detailed criticism would be out of place until we are in possession of the whole report. The fact observed by previous experimenters, that the decomposition of chlorine water is retarded by the presence of hydrochloric acid, is confirmed.

On Saturday and Monday the members of the section, together with members of Section A, engaged in discussions on "Electrolysis," and "Solution," which were mainly remarkable for the active part taken in them by Prof. J. H. Van Hoff, of Amsterdam, and Prof. W. Ostwald, of Leipsic.

On Tuesday, the President of the Section read a paper on "Phosphorous Oxide," P_4O_6, in the course of which he stated that this substance is very sensitive to the action of light, being resolved apparently into free phosphorus and a higher oxide.

One of the most interesting papers of the whole meeting was contributed by Messrs. A. G. Green, C. F. Cross, and E. J. Bevan, on "The Action of Light on the Diazo Compounds of Primuline and Dehydro-thiotoluidine." An abstract of this paper appears on page 707. It was illustrated by a large number of very interesting specimens, and experiments were made showing the mode of development, and illustrating the great sensitiveness of the compounds. Some of the results were really very fine, and as the images seem to resist any further action of light, and also to be unaffected by a large number of reagents, it is possible that the process will find many useful applications.

Prof. J. J. Hummel read a paper (see p. 712) on "Fast and Fugitive Coal-Tar Colours," which was illustrated by a large number of specimens. It was shown that the resistance which many coal-tar colours offer to the action of light depends on the nature of the mordant by means of which they have been applied to the fabrics, and whilst it is undoubtedly true that many coal-tar colours are of a very fugitive character, there are many others which, if applied with the proper mordants, offer a resistance to light little, if at all, inferior to that of the so-called fast natural dyes.

THE PHARMACEUTICAL CONFERENCE AT LEEDS.

Following the usual practice, the Pharmaceutical Conference met in Leeds on the days immediately preceding the meeting of the British Association. Mr. Reynolds, of the firm of Reynolds and Branson, well-known to photographers, is one of the past presidents of the Conference, and Mr. F. W. Branson was the local secretary for the Leeds meeting. The proceedings opened on Monday evening with an admirably arranged conversazione at the Philosophical Hall. One of the items of a full and varied programme was an exhibition of lantern slides, some of which were very fine, whilst of others it must be said that they showed too much of the chalk-and-sooty character which spoils so many otherwise good slides. Of especial interest were six slides by Mr. F. W. Branson, showing a complete series of the geological sections of Leeds. Many of these sections are no longer visible, and Mr. Branson is to be congratulated on having secured a series of really fine photographs of them, before they became hidden by débris and otherwise. A series of the fossils from the beds in these sections was on view in one of the rooms, and the two exhibits together formed an admirable example of the systematic application of photography to scientific purposes.

On Tuesday morning the president, Mr. C. Umney, delivered his address, which was followed by the reading of a large number of papers. Three of these have considerable photographic interest:—"Commercial Alkaline Sulphites," by C. H. Bothamley; "Chloroform as a Preservative," by J. F. Burnett, and a second paper on the same subject by H. Wyatt, junr. A paper on the quality and testing of glycerine, by Dr. J. Sewkowitsch, and a paper on the testing of methylated spirit, by E. J. Millard and A. C. Stark, may also be mentioned.

Alkaline Sulphites.—The object of this paper was to call attention to the character of commercial alkaline sulphites, a matter of importance to photographers as well as to practical chemists. The author pointed out that sulphurous acid, H_2SO_3, which is dibasic, is generally supposed to yield two classes of salts, normal sulphites, M_2SO_3, and acid sulphites (hydrogen-sulphites,. bisulphites) $MHSO_3$. A third class of sulphites, the so-called meta-sulphites or meta-bi-sulphites, with the general formula $M_2S_2O_5$, has recently been brought prominently into notice, and these salts are commonly believed to be new products. This, however, is not the case; they were described many years ago, by Muspratt, who gave them their correct name of anhydro-sulphites.

The only normal alkaline sulphite commonly met with is the sodium salt, which has the composition $Na_2SO_3\,7H_2O$. It is easily obtained in good crystals of a high degree of purity, but the presence of sodium carbonate is not uncommon, and some samples contain large quantities of this salt and of sodium sulphate. We may say, in passing, that we believe that the developing power, which has occasionally been attributed to the sulphites in conjunction with pyro and without the addition of any alkali, was really due to the presence of sodium carbonate as an impurity in the sulphite.

Sodium-bisulphite, acid-sulphite, or hydrogen-sulphite, whichever we please to call it, is not met with in commerce in anything like a satisfactory state of purity. The percentage amount of sulphurous anhydride which the pure salt would contain is 61·54. In four samples from different sources Mr. Bothamley found 8·1, 34·14, 22·3, and 39·0 per cent. respectively. The impurity is chiefly sulphate. It is very doubtful whether it is possible to obtain the acid sulphites in a pure condition, because even in solution they change into anhydro-sulphites.

The commercial anhydro-sulphites—or, as they are generally, but less suitably, called, metasulphites, or metabisulphites—are very satisfactory products if in the form of moderately large crystals. In three samples of the potassium salt the percentage of sulphurous anhydride found was 52·54, 56·02, and 57·42 respectively; the percentage amount in the pure salt is 57·63; a well-crystallised sample of the sodium salt contained 65·60 per cent. instead of 67·37, but a sample in very small crystals contained only 50·4 per cent.

The practical conclusion drawn from these results is that, whenever a pure acid sulphite is required, well-crystallised anhydro sulphites should be used. The same salts in small crystals are not so trustworthy; the crystals undergo a slight superficial alteration, and, since the surface exposed by a given weight of small crystals is much greater than that of the same weight of large crystals, the percentage effect of this superficial change is much greater in the first case than in the second.

Chloroform as a Preservative and Antiseptic.—The results recorded in these papers afford further evidence of the already well-known preservative action of chloroform. Solutions of various organic salts, such as tartrates and citrates, and of organic substances, such as starch, gelatine, sugar, &c., which readily grow fungi or moulds, under ordinary conditions, may be preserved for a long time without appreciable alteration if mixed with a small quantity of chloroform. In order to obtain the maximum effect, the liquid should be saturated with chloroform. Even under the latter condition the total quantity of chloroform present will be small, and, since this compound has no effect whatever in many photographic operations, its use as a preservative deserves more attention from photographers than they have hitherto given to it. For mountants and solutions of tartrates or citrates it is especially valuable.

Clearing Pyrogallol Stains.—One new doctrine recently put forward we pronounce to be an undoubted heresy. It was recently stated in a photographic journal that plain water was equal in effect as a clearer of pyro-made negatives to the acid clearing bath generally recommended. Now, this is a proposition that experience will at once disprove, and we can only imagine that the writer who put it forward had been misled by a misconception of the condition under which he worked, and that his results were due to some other cause than plain water.—*Scraps.*

Artistic Photography.—Rejlander said:—"I regard art as a means of making thought visible. If I can make a thought visible in a picture which people can understand, and be moved by it to laughter or tears, it is a work of art, whether I produce it by the aid of the camera or of the pencil. It is the mind of the artist, and not the nature of his materials, which makes his production a work of art. A man may paint, and not produce works of art, or he may photograph, and produce works of art."

Photographing Children.—Those who desire to make a speciality of photographing children should note what an English artist, Mr. R. Faulkner, whose photographs of children are used as Christmas cards all over the world, says about their management:—"Never allow any interference in your management of a child; if you require assistance from mother, nurse, or friend, give up the affair. Spoilt children will never make good pictures, so look upon them as merely worth so much money, and be content when you have obtained a photograph that has not moved."—*Wilson's Photographic Magazine.*

Notes.

Those who are interested in photographic studio building should make note of a caution published in a German newspaper, relative to the quick corrosion of sheet zinc when in contact with brickwork. It seems that in the Market Halls, Berlin, the zinc which rested upon the brick walls was found to be deeply pitted. Chemical examination of the bricks showed that they contained an appreciable quantity of soluble salts, to the agency of which the deterioration of the metal is credited. It is pointed out that this is possibly a feature of only certain kinds of bricks, and that danger from them might be obviated by placing between the walls and the zinc a protective layer of roofing felt or similar material.

The *Scientific American* gives an account of a machine for mounting photographic prints, but the description, in the absence of illustrations, is rather obscure. However, we learn that the contrivance consists of a couple of shallow boxes hinged together so that one forms a lid to the other. In one compartment are placed the trimmed mounting cards, and in the other the paper prints. Starch being applied to one of the latter, the box is closed, and "certain springs exercise their force," the result being that the starched print is brought into contact with its mount. When the box is again opened the mounted picture falls out, and is received into a receptacle lined with blotting paper. We do not know whether the machine deals effectually with those air bubbles and obstinate corners and edges, which generally cause trouble when pictures are mounted by hand.

When you select an amateur photographer for a companion on a walking tour, it is well to make sure that his tastes agree with yours. So says a naturalist. In the opinion of the latter, the enthusiastic amateur is a nuisance. He has not the smallest interest in your pursuit—that is, if you happen to be a naturalist—but expects you to be in full sympathy with his. He is always wanting to stop and take views in places which, as far as natural history is concerned, are about as productive as the Mile End Road. He invariably suggests that you should act as a sort of amateur policeman, and keep back the gathering crowds while he plants his apparatus in the midst of some busy thoroughfare; and, worse than all, he expects you to carry the camera. This last statement makes us doubt whether this naturalist is speaking the absolute truth, for giving his camera to other people to carry is just what the amateur does not do. We should like to hear what the amateur photographer has to say about the naturalist as a *compagnon de voyage*.

If the story that over the door of a certain photographic studio is the announcement, "Misfit photographs for sale," be not true, it is well found. The proprietor is reported to have said that mothers who have little children often buy pictures of children with long hair, when the hair of their loved ones hasn't grown, to send them to friends at a distance. Brides' pictures he can sell without any trouble. This photographer's opinion is that pictures of people are sometimes very much alike. No doubt this is true, but the rule is only a safe one as applied to babies. We have heard of a man, much goaded and worried over his failures to take an unruly infant, opening a drawer and exclaiming desperately, "You'll never get a photograph of your child; it's impossible. But there's a whole lot of other people's children in that drawer; pick out the nearest you can find." It would be a good thing if all babies could be photographed in this easy fashion.

The Abbé Collignon, curé of Bry-sur-Marne, in sending to the *Société Française de la Photographie* two photographs of the tomb of Daguerre, draws attention to the fact that the tomb itself and the paintings executed by Daguerre in the church of Bry-sur-Marne are in great need of repair. This is rather a reproach upon French photographers, and is almost a satire upon the enthusiasm which the jubilee of photography last year called forth. Daguerre's paintings in the church, besides being of interest as the work of his hand, are also worthy of preservation as remarkable examples of perspective, by which the church is made to appear twice its actual size. A full description appeared in the PHOTOGRAPHIC NEWS some months ago.

One can understand the indignation of the military officer at Cork, whose life his comrades made unbearable. The story, as told this week, is that they broke into his room and painted him with tar. This was bad enough, but not nearly so bad as what followed, for one of his persecutors brought his kodak, and, the outrage taking place in the early dawn, photographed the victim thus disfigured. There is something peculiarly irritating in this, because, though one may have sufficient philosophy to get over the tarry operation, to know that the scene may turn up in after years to one's shame and ignominy is beyond human endurance.

Dark rooms for tourists are multiplying. The proprietor of the Hotel de la Plage at Pouliguen, France, announces that his establishment possesses a photographic laboratory. At Manberg also tourists will find one at the establishment of M. Dandoy-Maillard. From establishing a dark room to keeping a stock of photographic requirements is but an easy step, and it may not be long before we shall hear of hotel proprietors being able to supply their customers with gelatine plates, pyrogallic acid, and hyposulphite of soda. When this time shall arrive it will be well if an international standard of sizes for plates were fixed. The continental makers do not adopt quite the same measurements as our English manufacturers, and much inconvenience is caused when an English tourist runs short of plates and has to purchase the nearest he can to fit his camera. This is one of the questions left out of the otherwise complete list discussed by the International Congress at Paris last year.

The successful photographing of snow scenes is a matter not unattended with difficulty. The exposure, as a rule, is not easy to arrive at accurately, and a peculiar flatness is often the result, the reason of which the photographer is puzzled to explain. It is not impossible that an investigation by Dr. Robert L. Bowles, of the effect of the sun when snow is on the ground, may throw a little light on this matter. Dr. Bowles remarks that sunlight reflected from freshly-fallen snow acts much more energetically on the skin than that reflected from older snow, and he decided the question by painting his face brown, and ascending, in company with eighty other persons, the Gorner Grat, where there was much snow. The result was, that in the evening all excepting Dr. Bowles were smarting from the effects of sunburn. Dr. Bowles concludes that heat is not the direct cause of sunburn, but that it is caused by the violet or ultra-violet rays which are reflected from the snow. If this be so, it is very clear that the photographer should make a considerable allowance in the exposure, according to the time the snow has been on the ground. The phenomenon presents, we fancy, a novelty to photographers, and it would be worth while to make some experiments on the subject.

The ushers in the Law Courts, it seems, make a collection of autographs, and as they come into contact with numerous celebrities who sometimes figure as the chief parties in an action or as witnesses, their albums must be full of interest. Possibly it may not be long before they add photographs to autographs. The latter, it seems, are not difficult to obtain, for ushers are privileged persons, and their requests for signatures are readily granted. Photographs possibly might be as easily procured. But if any objection were made, a sort of partnership between two ushers would bring about the desired result. While one usher might be looking after the autograph, the other would be arranging his camera, and when the celebrity sits down and takes the pen in hand, he could be photographed unconsciously. The two things would thus go nicely together, as in most instances the celebrity, while writing his name for usher number one, would hold his head steady sufficiently long to enable a photograph to be taken by usher number two.

It is rather curious that artists do not rely more than they do upon photographs for accuracy in points of detail. Blunders are constantly being made in the proper treatment of military uniforms and official robes. Even in so small a thing as a properly clad fisherman handling his tackle correctly, they come to grief. As an evening paper pointed out recently, a conscientious artist is obliged to resort to devices in order to get something like nature, and the paper we have just referred to speaks of visiting a professional fisherman, and finding him on his lawn in all his fishing dress, landing a brickbat with a salmon rod, for the information of what he called a "picture chap," who was sketching him in all sorts of attitudes. We have strong doubts whether any fisherman could get up sufficient enthusiasm over a brickbat to put any spirit into his attitudes. The instantaneous photograph of an angler in the act of landing a twenty pound salmon would be a very different thing. It would be worth while for amateur photographers, when on their travels, to bear in mind the requirements of artists. Some of their chance shots, not only of men, but of animals, might prove valuable from a commercial point of view as useful studies for artists.

Photography is now made so easy that the great majority of amateurs who buy a cheap outfit, and fancy they are at once photographers, never seem to take the trouble to master the very simplest preliminaries. A neophyte writes to a quasi-scientific contemporary as follows: "When I take the plates (one at a time) out of the dark slide, and put them in the developing dish, I cannot get the image to appear bold and sharp. Some are light, with all the details not visible; others are black, such as the face and arms of a person. But there is nothing to be seen after fixing except by looking through the plate when holding it between the light." This reminds us of the photographic experience of a young friend as related by a schoolfellow. "He tried to take my likeness, but nothing at all came out. Then he tried to take the cat, another blank. Afterwards he had a shot at the kitchen window, and got a chair, but there wasn't a bit of the window to be seen. Then he tried the water-butt—blank. Next he got the servant to stand for her likeness, and you could see something on the glass, but whether it was the girl's face or the eight day clock, no one knew. I didn't think much of any of his things excepting one, and that was a jolly good likeness of the chimney pots over the way. He hasn't done anything since. You see the servant doesn't like being turned out of the kitchen while he darkens the window and develops, or 'devilups' as *we* call it."

Mr. Du Maurier, in a recent number of the *Magazine of Art*, commences what promises to be an entertaining series of articles on "The Illustrating of Books." Mr. Du Maurier describes fully the two methods of drawing for wood; the one where the artist, having prepared his picture in washes of different degrees of intensity, leaves it to the mercy of the engraver; and the other of sketchy characteristics, where the engraver cuts a *facsimile*, and neither adds a line nor takes one away. Mr. Du Maurier writes pleasantly and kindly about his brother artists and their method of working, but at present has said nothing about himself and his own style. As Mr. Du Maurier was one of the first to make use of photography in book illustration, it is to be hoped he will give a little information on the subject. It is said that Mr. Du Maurier's drawings for *Punch* are photographed direct on to the wood by a process the details of which have never been made public, and it would be interesting to know if this is really the fact. Mr. Du Maurier himself is, of course, not the photographer.

FAST AND FUGITIVE DYE STUFFS.*

BY PROFESSOR J. J. HUMMEL.

THE stability or permanence of colours is a matter of very great importance both to the artist who uses them and to the general public who admires or buys the artist's productions. Some time ago it was noticed that many of the water-colour drawings of certain artists in our national galleries had faded so materially that it became really a serious question whether water-colour artists were doing themselves justice by spending time and talent in painting pictures the value of which would rapidly diminish, or whether the artistic public or the nation should spend large sums of money on possibly evanescent treasures. It was very desirable, therefore, that the permanence of the whole list of water-colours at present employed by artists should be thoroughly examined. This, indeed, was done during the years 1886-87-88 by Abney and Russell, and we cannot but be glad to learn that the result of their inquiry is eminently satisfactory, for, as they state, although many fugitive colours at present in use ought to be banished from the painter's palette, there still remains a good gamut of permanent colours available to the water-colour artist.

Now the work of the dyer is by no means to be compared with that of the painter in artistic merit; nevertheless, his productions frequently enter into the composition of real works of art of considerable value; I refer specially to art tapestry. And when, with melancholy regret, we admire the faded beauty of the productions of a former period at Hampton Court, Holyrood, the Gobelins, and elsewhere, we cannot but consider how necessary it is to know whether the colours of our modern tapestries are better or worse, in point of stability, than those formerly employed. But the dyer's art is not confined to tapestry; it finds a more important and useful application in the ornamentation of all manner of textile fabrics in common daily use, and hence it is surely incumbent upon dyers, manufacturers, and the public alike, to consider well the permanence or otherwise of the colours employed in the decoration of textile fabrics generally. In discussing the subject of fast and fugitive dyes, it is well that we should first define the meaning of the terms "fast" and "fugitive." Unfortunately, as usually employed, they have a very wide and indefinite signification. The term "a fast colour" means different things to different persons. To me it implies that the colour will not fade when exposed to light and atmospheric influences; to another, that it is not impoverished by washing with soap and water; to a third, it may mean that the colour will withstand the action of certain manufacturing operations, such as scouring, milling, stoving, &c.; while a fourth person might possibly be so exacting as to desire in a fast colour its resistance to all the varied influences I have mentioned. As a matter of fact, no dye colour is absolutely fast, even towards a single influence, and it certainly cannot pass unscathed through all the operations which it may be necessary to impose upon individual colours applied to this or that material. Many colours are fast to washing, or milling, and yet very fugitive to light; others are fast to light, but fugitive to milling; while others are fast to both influences—in short, each colour has its own characteristic properties. It is, however, by no means necessary to demand absolute fastness to a variety of influences from any colour. A colour may bleed in milling, and hence be unsuitable for tweeds, and yet be most excellent for curtains and hanging, because of its fastness to light. So, too, a dye capable of yielding rich and delicate tints, but only moderately fast to light, is still perfectly well adapted for the silks and satins of the ball-room, although it would be quite inadmissible for the pennon at the mast-head. The colours of carpets, curtains, and tapestry should certainly be fast to light, but no one expects them to undergo the fatigue of the weekly wash-tub, and just as little do we look for the exposure of flannels and hosiery, day by day and week by week, to the glare of sunlight, much as we desire that the colours shall not run in washing. Fortunately, we have for each material ranges of colouring matters admirably adapted to the foregoing several requirements, and although it is quite a laudable desire to wish that each and every colour should be of all-round stability, it is vain to hope for such an elysian state of things at present.

For all practical purposes, then, it is enough to define a "fast" colour as one which will not be materially affected by those influences to which, in the natural course of things, it will be submitted. Hence it becomes necessary, in speaking of a fast colour, to refer specially to the particular influence which it resists before the term acquires a definite meaning. The manufacturer who wishes to be precise should, for example, demand from the dyer a colour which is fast to light, or fast to milling, or fast to light and milling, and so on; and my belief is, that if more care were exercised in the use of definite terms of this kind, business transactions would run a little more smoothly than is now frequently the case. All I have said with respect to the term "fast" may with equal propriety be applied to the term "fugitive." This, too, has no very definite meaning until a qualifying statement, such as I have mentioned, gives it precision.

In view, then, of the considerations I have now placed before you, it is evident that everyone connected with the application of colouring matters should know the sensibilities of his colours towards various influences. It would, of course, be extremely convenient if we could arrange all colouring matters in two sharply defined classes of fast and fugitive dyes, and in the year 1669 the French Government actually attempted to do this, and prescribed certain simple tests to distinguish one from the other. The dyers of that day were also required to confine themselves to one or other of the two classes—*bon tint* and *petit tint*, as they were called—and, in accordance with their choice, they were restricted to the use of certain specified dyestuffs. The whole system, however, proved a failure; it hindered the progress of the dyer's art, and ere long it was abandoned.

(To be continued.)

* Paper read before the Chemical Section of the British Association.

LINED SCREEN PLATES.—M. Parisien gives the following process for making these plates. He fixes in a mandrel, on an ordinary turning-lathe, a copper or zinc tube, and on this tube he traces, with the aid of the proper tool, a very long and slender thread. This tube being split in the direction of its length, opened, and flattened in a copper-plate press between two sheets of cardboard, yields a plate having very regular parallel lines.—*Moniteur.*

ARRANGING THE SITTER.—Adam Salomon once wrote:—"The photographer's first care should be to study his model before placing it under the objective's inflexible and undiscriminating eye. Here begins the rôle of light, with the infinite gradations by which it can indicate form. It is, therefore, of the utmost importance to comprehend the characteristics of the model, and how they may be best rendered, so as to modify the action of light, and thus secure in the portrait suggestions of the true type and character of the sitter."

A NEW DIRECT READING PHOTOMETER MEASURING FROM UNITY TO INFINITY.*

BY FREDERICK H. VARLEY, M.I.E.E., F.R.A.S.

The object I had in view in designing this apparatus was to meet a want that has been felt by electrical engineers and others interested in the measurement of light, namely, a convenient form of apparatus as handy to manage as the usual set of measuring instruments which are provided, so as to take its position along with the voltmeter, the ani-meter, and the Watt-meter.

Incandescent lamps are now made of such generally uniform construction that if we can, with facility, measure the light produced, we can readily deduce, for all practical purposes, the amount of current delivered, and thereby determine the general efficient working of the installation. Or, conversely, if we know the current in Watt's passing through a glow-lamp, we can determine the suitability of the filament for the purpose required, provided we can readily obtain photometric measurements. The conditions imposed are, that the instrument should be portable, have a range from one-candle power to that of the electric arc, that the light to be measured, and that of the standard, should be exactly at the same distance from the screen.

This instrument consists of two discs, each pierced by two semi-ring-shaped windows or apertures. These openings extend to the half-circle (180°); both are of the same width, 1 inch broad. The openings in the two discs are placed in reverse positions to one another, so that if one half-ring is opened to its full extent (180°), the other half-ring is entirely closed; or, if the discs are shifted to an intermediate position, both apertures will be opened to an equal extent—namely, 90°.

If, in this position, the discs are rotated, it is obvious that an equal amount of light can pass through both rings, but if the light to be measured is as one to seventeen c.p., then the angular length of the two apertures must bear a proportionate ratio in order that the two shadows shall be of equal density; and accordingly, one aperture will be open to the extent of 10° for the brighter light, whilst that of the standard light is opened 170°. Instead of dividing the circle into the conventional 360°, I divide the half-circle into 2,000 parts, this giving a range from 1 to 1,999, or 2,000 in round numbers. By still farther shifting the discs, this aperture may be entirely closed and read up to infinity. The divisions of the half-circle are numbered from left to right and right to left, showing at once the fraction values of the angular extent of the opening or arc, and thereby giving the values of the light.

In order to make the discs turn one upon the other, I have devised a modification of the Fergusson paradox; that is to say, the discs are carried by independent shafts, one of which is hollow to allow the central axis to turn within it; at the end farthest from the discs a cog-wheel is fixed to each axis. By means of a sliding link the two wheels can be brought into gear with the axis also provided with cog-wheels, each being the same diameter, but one is cut with 100 teeth, whilst the other has 99 teeth. Thus, upon rotating the discs, each revolution of the gearing wheels advances the discs, and so changes the proportion of the openings, one decreasing whilst the other increases, and *vice versâ*; this we can do until the two shadows are of equal density, or approximately so, when the final adjustment can be given by hand. Behind the windows two hollow cones are placed which have their axes directed to a point common to both, but at some distance in front of the discs where the two shadows fall upon the screen. A second or back screen is then placed at the mouth of these cones, over which it fits, and effectively cuts off one light from the other, so that on one side is, say, the electric light, and on the other the standard candle. The light from both passes through axes of their respective cones, and through the discs, and on to the screen upon which the shadow image is cast.

This apparatus, in its present form, has only just been received from Mr. Lege, who has constructed it for us, and Mr. Friese Greene and myself are arranging a series of experiments which, we hope, will prove useful in photography.

In the course of the discussion, Sir William Thomson stated that it was a question whether integration by sensibility is the same as if continuous light be employed. There is a general idea that they are the same, but the point had not been, so far as he knew, absolutely settled. He had compared sunlight with the light of a candle by means of a pinhole one millimeter in diameter at a distance of a few yards from the paper screen, whilst the candle was at a distance of a few inches; he employed the shadow method. He considered the piece of apparatus exhibited by Mr. Varley to be well devised, and hoped that at the next meeting of the Association he would be able to give his results by both methods.

Professor J. D. Everett said that in colour experiments it is assumed that the penumbra method, such as just presented, holds true, because of the consistency of the results.

Professor G. F. Fitzgerald remarked that it has been calculated that if the energy of all the solar radiations falling upon the earth could be conserved and utilised, each square metre of the earth's surface would afford sustenance to ten individuals, so that—as someone, not an Irishman, had expressed it—"there would be so many people that there would not be room for anyone."

Dr. Oliver Lodge stated that experiments had been made in Germany showing that a curious physiological effect of flickering light under certain conditions was the production of colour, and that the colour disappeared when the motion was increased.

Mr. Frederick Varley, in reply to the speakers, said that he was glad to hear from Sir William Thomson the results of his experiments in comparing the light of the sun with a standard candle, and thanked him for the suggestions and encouraging opinions he had expressed. He would point out that the great object he had in view in constructing this apparatus was to obtain a portable and readily worked instrument which could be set up in any room or laboratory. The working of the Bunsen photometer required a room more than a hundred feet long in order to measure a 10,000 candle power arc light. After speaking of Professor Ayrton's photometer, he pointed out that by means of the new apparatus, measurements of the electric arc-light could be obtained in the space occupied by an ordinary table.

* Read last Wednesday at Section A of the British Association.

The Smithsonian Institute. — How many of our photographic friends who have been to the Convention in the body, or *via* the published accounts thereof, are acquainted with the fact that the Smithsonian Institute owes its existence to the generous endowment of the son of an English peer? Such, however, is the case, as the institution was founded by a bequest of 515,169 dols. "for the increase and diffusion of knowledge among men" by the Hon. James Smithson, who was the younger son of the Duke of Northumberland, and brother of Earl Percy, who led the British reinforcements at Lexington, and who also commanded a division in the attack on Fort Washington in this city during the Revolution. James Smithson was of an extremely studious temperament, having graduated from Oxford with an honorary degree the same year that his brother Hugh, Earl Percy, became Duke of Northumberland. His strong ambition was to leave behind him a name which should endure, and, from present appearances, his ambition and desire are in a fair way of accomplishment.—*Anthony's Bulletin.*

METEOROLOGICAL PHOTOGRAPHY.*

BY JOHN HOPKINSON, F.L.S., F.G.S., F.R.MET.S.

THE speaker called attention to the increasing importance attached to photography as a means of illustrating scientific subjects and aiding in scientific research. In no branch of science, he thought, could photography be of greater value than in the elucidation of meteorological phenomena, owing to the transient nature of such occurrences.

The appointment of a committee of the British Association on Meteorological Photography, by which committee instructions to photographers would be issued with the view of instituting a systematic method of working, would, he felt sure, greatly extend the interest taken in the subject, and increase the scientific value of the results. The chief object of such a committee would be to investigate and report upon the means by which photography can most advantageously be applied to the elucidation of meteorological phenomena, such as the forms of clouds, lightning flashes, and the effects of storms. The committee would also undertake the collection of photographs of such phenomena and keep a register of them, reporting the additions made each year, and would compile a bibliography of the subject, adding to it either annually or every few years.

In the study of the various forms of clouds, he believed that a satisfactory classification could best be made by the comparison of numerous photographs. The relation between cloud-forms and atmospheric pressure and temperature would be an interesting field for research, and an attempt might be made to devise means of overcoming the difficulty of photographing light clouds on a blue sky, due to blue rays being almost as powerfully actinic as white, either by devising some simple form of polarizer, or by the employment of a film particularly sensitive to the yellow rays, or more sensitive than usual towards the red than towards the violet end of the visible spectrum. In the investigation of lightning by photography, special attention would be given to the phenomenon of the appearance on the plate of so-called dark flashes, with the object of arriving at a conclusive explanation of the effect, and an endeavour might be made to determine whether lightning really always forms a streak, or sometimes only a point in extremely rapid motion. The collection and exhibition of photographs showing the destructive effects of storms, whether the destruction or damage were wrought by rain, by wind, or by lightning, might not be considered of such scientific importance as the investigation of clouds and lightning, but it would add much to the general interest of the inquiry.

ONE of the latest American fads is the photographing of miniature portraits on silver and gold watchcases and like articles, and burning in the images in such a manner as to render them indestructible. This is the outcome of a woman's effort.

THE GENESIS OF PORTRAITURE.—Portraiture is, after all, an art to which love is under long obligation; and it is fitting that the first rudimentary portraiture was, according to tradition, achieved by an Etrurian maiden, the daughter of a potter, who traced upon a wall the shadow of her swain. That was 776 B.C. After this, the first artists in monochrome—Crates of Sicyon, Philocles of Egypt, and Cleanthes of Corinth—practised the art, which then went by the name of skiagraphy.—A. W. TUER, in *Eng. Illustrated Mag.*

* Abstract of remarks made at Section A of the British Association last Monday.

THE TREATMENT OF SUBJECTS BY FOCUS.

THE BEARING OF SPHERICAL ABERRATION ON OUT-OF-FOCUS PLANES.

BY THOMAS R. DALLMEYER.

IF a lens is aplanatic in itself, and the means is also given of introducing spherical aberration temporarily and at will, it is evident that an extra power is available. A careful examination of the accompanying diagrams will show the true and intrinsic value of the introduction of positive spherical aberration as regards improvement of definition in out-of-focus planes.

Fig. A represents the course of a pencil of rays after passing through a perfectly corrected lens. If the lens is focussed for a point of light, every ray passes accurately through a point in the image, its focus. If a transverse section be made on either side of this one plane of the only exact focus, it is represented by a disc of uniformly illuminated light, smaller or larger and more or less intense, the nearer or further the plane be from that of the absolute focus. In effect, points or lines in the out-of-focus planes on either side are *uniformly enlarged and weakened.*

Fig. B represents the late Mr. Grubb's diagram for comparison with the above, illustrating a lens with positive spherical aberration outstanding. It is inadequate, first, because it *really* represents a lens of longer focus than that above; secondly, it implies that the least circle of aberration, or a plane very near it (his diagram is not quite clear) is the best focus. The first error would give this lens undue comparative advantages as regards the measurements (longitudinal and transversal) if two similar uncorrected lenses of the same aperture but different foci were compared. The second error misled certain photographers (amongst them Mr. W. E. Debenham) who, without studying the question from the correct optical standpoint, only compared the transversal measurements, that, taken alone, have *nothing* to do with the comparison to be made. The late Mr. Grubb dwelt on this aspect of the case, but was not blind to the true advantages, although his drawing is wrongly disposed. He was unfortunate in the way he puts the *real question* at issue: "As a last resource with those who would inculcate the opposite, it will probably be advanced that in the uncorrected lens the rays beyond the focus are more condensed in the centre—*i.e.*, near the axis—than they are in the corrected lens. This is true, no doubt, but the antidote to the advantage will be found at the opposite side of the focus, where the rays are concentrated as much outwardly in the pencil as they are after crossing the axis concentrated inwardly."

Fig. C represents a proper comparison of a lens with excessive spherical aberration of the same (best) quasi-focus as the aplanatic lens, fig. A. I have shown the transversal measurement at the best focus in fig. C, 75 units, equal in diameter to an out-of-focus circle in A, distant 185 units beyond the plane of accurate focus (or the same measurement as really has the best focus in Grubb's diagram, although he disposed it wrongly).

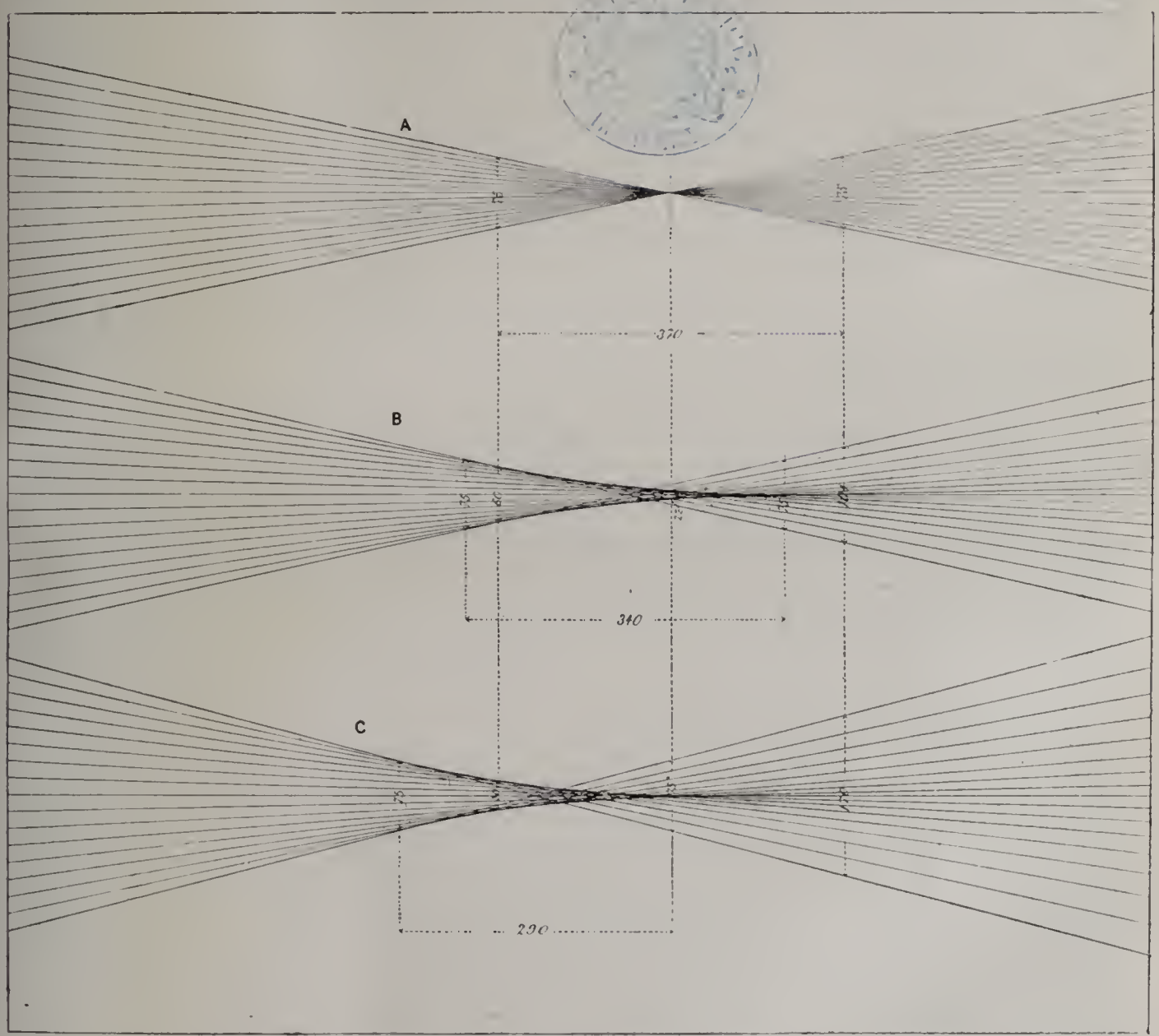
Now, at a distance of 185 units beyond the plane of best focus with the lens, fig. C, although the transversal measurement is very much greater—namely, 170 as against 75 in fig. A—the image is nevertheless, in this case, distinctly better defined than in fig. A, due to the *inward concentration* along the axis.

Comparing A and C on the lens side of the focus, and taking a transversal measurement, the same number of 185 units distant from the best focus, the uncorrected

lens would have a great advantage, 30 as against 75 units, but as there is a tendency to *outward concentration*, the corrected lens will have the best of it as regards its power of approximate image formation, being an uniformly illuminated disc as compared to a bright ring with a comparatively dark centre.

The case illustrated is intentionally exaggerated, but, of course, when aberration of this character is introduced to a less degree, the same reasoning applies. On the further side of the focus there is a tendency to *inward concentration* that benefits background, maintaining the structure better than in the case of a perfectly corrected lens. On the nearer side of the focus the tendency is to *outward concentration*, that results in destruction of structure for wide planes sooner than would be the case with a perfectly corrected lens between the same wide limits. Careful observation shows that the quality of definition at the position of the least circle of aberration in an uncorrected lens, fig. C, is almost identical in quality of definition with that given by a cone of rays in the aplanatic lens, fig. A, of the same diameter. This would give even an advantage for a small amount of foreground for the uncorrected lens.

Now, any unbiassed thinker can see that, comparing planes near the best focus of the uncorrected lens, fig. C (towards the lens), with those of the corrected lens, there



is little to choose between them for image-forming qualities, the advantage for a measurement up to the least circle of aberration resting with the uncorrected lens. When the separation of the conjugate points corresponding to the main feature of interest, and considerable foreground is great, then, of course, as before stated, the tendency to reversal and reversal itself comes in. Between the eye and nose or beard, for example, as put forward by one photographer, Mr. W. E. Debenham, if softness is a desideratum, the amount of out-of-focus effect for such a distance would hardly be distinguishable in cases taken with A or C, although there would be much stronger contrast employing lens A as compared to C. Beyond the plane of focussing, A, from keen sharpness, falls off rapidly, while C, on the other hand, softens more and more, but maintains structure better than when using lens A. The planes behind the point focussed for are *almost always* greater in the separation of their conjugate foci than is necessary for adequate foreground definition in portraiture. It is begging the question to include planes

that are not wanted in the use of a scientific application of optical laws to bring about the practical—and proven—utility of an instrument that *not only lessens contrast throughout*, but absolutely—and not relatively—*improves* definition in more distant planes—"*depth* of focus"—but also for nearer planes up to the extent usually required is practically as good, if not better, and relatively much more uniform, than in the case of a perfectly corrected lens. Carried to an *extreme* in this direction, the definition, as I have before pointed out, would be absolutely *worse*.

In conclusion, the comparison of figs. B and C may help to make clear the fact that the disposition of rays nearer the lens will correspond to foreground, and those farther from the focus to background, the plane of the plate being a fixture. Take fig. C, for example, as focussed for parallel rays, and let B represent the course of rays for some object nearer the lens. The rays here proceed to form a focus further from the lens. The rays that fall upon the plate are those tending towards the direction of *outward concentration*, and consequent bad definition.

THE ROYAL CORNWALL POLYTECHNIC EXHIBITION.

THE proceedings of the Society were opened by the President, the Rt. Hon. Leonard Courtney, M.P., who gave the presidential address in an able manner. The hall was packed to the full extent. The address was proposed by Sir Joseph Pease, M.P., and seconded by Sir Edward Siereking, M.D., physician to the Queen; and followed by a short speech by Mr. Pendarves Vivian; the Exhibition was then declared open. The photographic department is always an attractive feature. As usual, it is under the management of Mr. W. Brooks, of Reigate. The exhibits in this department are greatly in excess of any previous year, and in future the Society will have to grant more space to the department. The use of dark rooms can be obtained in the town, and also plates. In the neighbourhood there is plenty of work for the camera in all directions.

PHOTOGRAPHIC SECTION.—JUDGES' REPORT.

The judges have great pleasure in congratulating the Society on the maintenance of the high excellence of the exhibits in this department. As regards the number of pictures, they are far in excess of any previous year; several of the old exhibitors are again well to the front, and also many new exhibitors who are well known adepts in the art-science. The judges are well aware that many exhibitors have apparently been passed over whose productions are of high technical excellence; in some of the classes the judges have been obliged to double the awards on that account. In the professional section, the landscape subjects are not so numerous as in former years. Mr. R. W. Robinson is still persevering with his self-imposed task of artists at home, which, when completed, will form a very valuable and interesting collection. Platinum printing is fast driving silver printing out of the field, as quite two-thirds or more of the exhibits are printed by the former process. The Amateur Section is also well maintained. In the Photographic Appliance Department, Messrs. Oakshot and Co., of Falmouth, occupy a room, and exhibit almost every requisite for either amateur or professional photography, which will be very attractive during the exhibition.

Professional Section.—The Autotype Company, of London, are represented by some of their well-known work—enlargements in carbon—the best of which is a portrait-enlargement of the Right Hon. Earl Selborne, in his robes of office, and also two portraits of the Marquis of Salisbury and Mr. W. E. Gladstone. There is also a goodly number of pictures, chiefly enlarged portraits by a local photographer, Mr. W. M. Harrison. J. B. Gibson sends a series of cloud studies, which are of great value to artists; he also sends several landscapes, which show careful work. Mr. T. Protheroe, of Bristol, contributes three enlargements; for No. 23 he receives a first bronze medal. Mr. Lyd. Sawyer sends some master-pieces in instantaneous photography, and the judges think he might have shown better taste if he had left out those objectionable tickets which each frame contains, stating the awards received at other exhibitions; it might impress many people that they were put there for influencing the judges. Pictures sent in this way in future will at once be disqualified. No. 26 of this series, "On the Tyne," has been awarded a first silver medal; the treatment is admirable, and the whole series by this gentleman are well worthy of careful study. Mr. R. H. Lord sends two pictures (composition). No. 37, "Work and Play," is a very fine study, to which is given a first silver medal. Mr. T. G. Whaite takes a first bronze medal for an enlargement, a group on the sea-shore, which shows good work. Mr. W. E. Henry sends six frames; the subjects are of Lichfield Cathedral, which show skilful manipulation. Mr. H. P. Robinson is not so happy in his subjects this year; No. 51, "Gossip on the Beach," a composition picture, is a little too hard to be effective, and not by any means up to his usual standard. Mr. W. J. Ankorn sends two clever little pictures of the genre order. Mr. E. Spencer is represented by six pictures of merit. Mr. H. W. Reeves has some clever interiors, and No. 65 has been awarded a first bronze medal. Mr. Richard Keene, of Derby, receives first bronze medal for his series of pictures in platinum of Old Moreton Hall, Cheshire, which are very fine indeed. Mr. W. W. Winter, also of Derby, takes chief award in portraiture—viz., first silver medal, No. 81, "Miss Gibbs." This gentleman's work needs little or no comment. Mr. C. C. James shows several good pictures. Mr. B. Wyles shows several portrait studies of large size, and several other very clever studies. Mr. J. D. McNeille sends two pictures, the best of which is "Hoar Frost, Holy Trinity Church." To No. 110, by Mr. F. Whaley, has been awarded a first bronze medal for his clever and effective picture, "A Tale of the World." Miss Annie Blake shows some coloured work by the air brush, the colours being far too crude to give any artistic effect. Mr. S. W. Bhednor contributes a goodly number of small pictures, which receive honourable mention. Mr. R. W. Robinson takes first first bronze medal for his picture, landscape with cattle, which is well treated, and with good atmospheric effect; he also continues his series of "Artists at Home," which are exceedingly fine; to these honourable mention has been awarded. Mr. H. Hewitt forwards two pretty little pictures. Messrs. York and Sons, of London, exhibit a frame of lantern slides, the subjects being well chosen, and are awarded honourable mention. Mr. L. Berry shows two pictures of the High Altar of St. Mary's. Mr. F. W. Edwards is again represented by several of his well-known pictures of large size printed in platinum; one of a silver shield is a marvellous production. Mr. J. E. Goold shows some exceedingly good instantaneous pictures of ships of war. Mr. W. J. Byrne, of Richmond, is represented by three frames of panel portraits taken at the homes of the sitters, which leave nothing to be desired, being soft, brilliant, and well modelled; frame No. 179 receives the award of a second silver medal. Mr. F. Greene shows some fine cloud studies. Mr. G. Speight shows one picture. Mr. J. Lewis sends a series of pictures by Dr. Nichols' Kallitype process, similar in effect to platinum pictures.

Amateur Section.—Mr. Westly Fry has been awarded a first bronze medal for No. 203, "Young Naturalists," an enlargement on bromide paper. It is full of atmosphere, and the subject is very artistically treated. Mr. John Pike also sends some very fine enlargements on bromide paper, the best of which is "Castle Garth;" Mr. C. V. Shadbolt shows some very careful small work; Mr. A. G. Tagliaferro is represented this year by two productions, "Choragium," a classical subject treated in a masterly way, and the surroundings are well in keeping with the subject; to this has been awarded a first bronze medal. Dr. J. J. English has three frames of good work. The Rev. H. B. Hare carries off the chief award, viz., first bronze medal for the best landscape in the section, "Under

the Mendips," which is a gem in its way; the same gentleman is represented by several other pictures of equal merit. Mr. S. F. Clarke, L.D.S., forwards a pretty little picture, "What love hangs by," of the genre class. Mr. A. K. Dresser is very strong in his exhibits, which are very varied; No. 225, "Corbiere Rocks in a Gale," takes a first brouze medal. Mr. C. V. Roe shows several well-chosen subjects. Mr. J. W. Charlesworth sends a perfect little gem, No. 241 (instantaneous) "A Grey Day," very tenderly treated, and has been awarded a first bronze medal. Mr. T. H. Morton shows five frames, cathedral subjects; Mr. T. H. Hermon also sends five frames of good work. H. D. Amott, No. 256, a frame of interiors, takes a first brouze medal; these are exceedingly fine, and well rendered in every respect. Mr. J. Mountford shows some capital studies on the Avon. A. Steiglitz, F. P. Perkins, T. L. Buck, C. Court Cole, and several others show very good work; the latter gentleman's productions are printed by Blanchard's platinum toning process, and have a very pleasing effect.

Photographic Appliances.—Mr. James Wood, of Liverpool, exhibits a print-washer, with adjustable rack for plates, of improved pattern, which seems very effective. Mr. W. Rooke, of London, also exhibits a washing machine for prints, with spray bar which rises and falls by means of floats on each side, aud is automatic in its action. Mr. E. Spencer sends a head-rest of very ordinary character, similar to those used for children twenty-five years since, and at that time were in every dealer's catalogue.

The Art Union of Cornwall.

The drawing of the Art Union took place last Friday in the Polytechnic Exhibition; the prizes have to be selected from the Fine Art section, and also photographs from Professional Section. Result as follows:—319, W. N. Carné, 10s.; 776, W. N. Grylls, £1; 943, B. Freeman, £5; 926, W. H. Olni, £2; 220, Miss Simmons, £1; 676, E. Spencer, 10s.; 906, Dr. H. Moore, £2; 4, W. J. Hosking, £1; 802, Capt. Hrestendahl, £1; 592, R. Fox, £8; 648, R. Ledderdale, £15; 789, E. W. Newton, £3; 180, W. Johns, £3; 991, E. Hancock, jun., £1; 129, Earl of St. Germans, £5; 1808, Dr. Banks, £1.

PHOTOGRAPHIC MANUFACTURERS' AND DEALERS' ASSOCIATION.

With a copy of the Rules and Articles of Association of the above, we receive also a notice addressed to the trade as follows:—

To Manufacturers of and Dealers in Photographic Material.

Gentlemen,—The photographic trade having assumed very large dimeusious during the last few years, it has been felt desirable that there should be a society formed to specially protect the interests of the trade.

It is well known that many abuses have crept in which can ouly be effectually dealt with by an organised association, and many questions have arisen the mere discussion of which by such an association would undoubtedly be of great advantage to the trade generally.

A meeting was held at Anderton's Hotel on July 29th last, at which the leading London and some provincial manufacturers and dealers were present, when it was unanimously resolved that a trade association should be formed, and for that purpose a provisional council, consisting of Messrs. George Houghton, Conrad Beck (R. and J Beck), A. H. Harman (Britannia Works Co.), A. C. Edwards (B. J. Edwards and Co.), and W. H. Walker (Eastman Co.), was appointed to frame rules for the management of the proposed Association.

The provisional council having drawn up a set of rules, a farther meeting of the trade was held on the 2nd inst., at which the proposed rules were adopted—subject to confirmation at the next general meeting—and the Association duly formed with the following membership:—

Adams and Co. (81, Aldersgate Street), Autotype Co. (W. S. Bird), R. and J. Beck, Blackfriars Sensitising Co., Brittauia Works Co., Ilford (A. H. Harman), Henry Creuch, T. R. Dallmeyer, the Eastuan Co. (W. H. Walker), B. J. Edwards and Co., Elliott and Son (Barnet), England Bros., Jonathan Fallowfield (T. W. Hindley), Hinton (Bedford Street), Holmes, Sadler, and Holmes (Manchester), George Houghton and Son, W. Lancaster (Birmingham), London Stereoscopic Co. (Butler Humphrey), Percy Lund and Co. (Bradford), George Mason and Co. (Glasgow), Mawson and Swan (J. B. Payne), Morgan and Kidd, Noakes and Son (Greenwich), W. W. Rouch and Co., Ross and Co. (J. Stuart), Otto Scholzig, Jaues Swift and Son, R. W. Thomas and Co., Limited (J. T. Sandell), William Tylar (Birmingham), Walter Tyler, W. Watson and Sons, Wratten and Wainwright.

As it is desirable that the scope of the Association should be as broad as possible, I shall be pleased to forward on application a copy of the rules, together with form of application for membership.

The next general meetiug will be held on Monday, the 22nd inst., at 4 p.m., at Anderton's Hotel, Fleet Street, London.—Yours faithfully, Birt Acres, Hon. Sec., *pro. tem.*
131, *Richmond Road, Hackney, London, N.E.*

PHOTOGRAPHIC PORTRAIT GALLERY.

On the above subject the *Daily News* last week quoted the following letter from Mr. C. A. Ward:—"The suggestion is good to have a gallery of photographic portraits added to the picture gallery. The Dublin Gallery only the other day carried off the portrait of Richard Burke, the son of Edmund. That, except that it is very well painted, did not much matter, because Richard was nobody. But Lord Camden was also carried off, and that should have gone to the portrait gallery. The provincial galleries will become a positive nuisance if they are allowed to compete with the central gallery when the portrait of a celebrated character comes into the market. For national utility all these portraits should naturally gravitate to London as a centre, that they may be all collected under one roof. Photographs of them might be distributed to all who want them and can purchase them. So much for the portrait gallery. But why does not the National Gallery devote a room to photographs? We might have a perfect series containiug every picture in every gallery of Europe; and if the same room were fitted up with the authorised foreign catalogues also, we could have reminders of every great picture in the world without steppiug out of Trafalgar Sqnare. At first they might be done with each picture of the size of a threepenny piece, so that two or three sheets would comprise the whole gallery of Dresden or the Pitti. These miniature presentments could be brought out to any dimeusion by being placed under lenses fixed in the room they were shown in. Such comparative æsthetics would be a new discovery in art. This is so easy, so practicable, and so desirable, that it should be done.'

In a subsequent issue our contemporary gives a further communication from the same writer to the following effect:—"The thing to be attempted is this: take, say, the Dresden Gallery, which, amongst its 2,200 pictures, is very rich indeed in *chefs d'œuvre*. Have them all well photographed, reduce every picture to a uniform size, that of a threepenuy-piece, aud place some 500 of them in their rotation, and with the reference numbers of the gallery itself upon a card. In this way five cards would sum up the coutents of the eutire Dresden Gallery. Every public gallery in Europe could be similarly transferred to cards by photographic process. Enough would be realised if we could bring the image of any picture out of its European gallery before us iu a moment, for no one iu his right wits would resort to a photograph or to an engraving to study colour from. But what could be studied by the aid of photography is drapery, treatment, form, and design. This would be quite sufficient to lay well and solidly the foundation of a quite new study—that of comparative æsthetics, a study heretofore non-existent in art except in the minds of the very greatest painters, Raphael, Buonarotti, Titian, Rubens, and a few more men who travelled, thought, and saw. England should begin and photograph all her own pictures first, and theu reduce them on sheets as above. Then we should invite the co-operation of other couutries, and pro-

pose to present them with our gallery in miniature in exchange for that of their own. If co-operation failed, we could do their galleries for ourselves, and the photographs so obtained would would also sell with the public here.' "

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

THE following experiments show the influence of

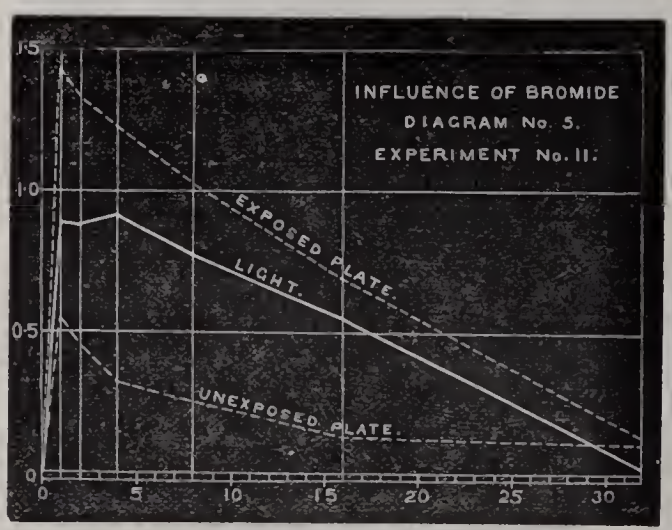
Variation of Ammonium Bromide.

Experiment 10.—Plate: "Wratten Ord."

Developed for 4 minutes, 100 c.c. = $\begin{cases} 0{\cdot}123\ NH_3 \\ 0{\cdot}375\ \text{Pyro.} \end{cases}$

Ammonium bromide grms. in 100 c.c.	0·00	0·10	0·20	0·40	0·80	1·28
Relative amount ...	0	1	2	4	8	12·8
Density	1·81	1·73	1·61	1·43	0·34	0·00

Experiment 11.—Plate: "Wratten Ord." Exposure = 40 C.M.S. Developed 4 minutes in 100 c.c. = $\begin{cases} 0{\cdot}162\ NH_3 \\ 0{\cdot}342\ \text{Pyro.} \end{cases}$ and various amounts of bromide. See Diagram No. 5.



Ammonium bromide	·057	·114	·228	·457	·918	1·828
Relative amount ...	1	2	4	8	16	32
Density exposed plate	1·450	1·335	1·235	1·025	·685	·120
Density unexposed plate	·560	·455	·315	·255	·130	·090
Density due to light	·890	·880	·920	·770	·555	·030

It is clear that development in both experiments was entirely prevented in these four minutes when the amount of bromide was about ten times that of ammonia present.

It also appears from our experiments that a rational developer would consist of a decinormal solution of ammonia, containing so much pyrogallol and ammonium bromide as would correspond with the formula—

$$C_6H_3(NH_4O)_3 + NH_4Br.$$

We have represented many of these results in the form of diagrams. It will be interesting just to point to diagrams Nos. 1, 3, and 4, to show the great amount of action which the alkaline developer may have on the bromide of silver, although it has never been exposed.

This disagreeable property is common to all alkaline developers, and it renders them unsuitable for scientific investigations. In all our important work we use exclusively the ferrous oxalate developer, for the reason that it attacks unexposed bromide of silver so slowly that within one hour and even more, no appreciable density can be developed upon a really good plate. Nor does its action vary much with its composition. The addition or omission of bromide from the constitution of this developer does not seem to have any great influence, and a greater or less concentration of the reagents within considerable limits does not affect its action; indeed, we have not found any variation to arise from alterations in its composition, excepting the length of time needed for completion of development.

The following table shows how the density of an exposed plate grows as the time of development is prolonged from five minutes to one hour.

Experiment 12.—Ferrous Oxalate.

Time.	Density exclusive of Fog.				
	I.	II.	III.	IV.	V.
Minutes					
5	·365	·350	...	...	·215
10	·525	·460	...	...	·305
15	·615	·550	·795	·570	·410
20	·615	·575	...	...	·420
25	·700	·650	...	...	...
30	·700	·660	·860	·670	·450
45	...	...	1·000	·715	·515
60	...	...	...	·740	...

Columns I. and II. are the results obtained upon the same plate, one (I.) portion of the strips developed in a developer consisting of 4 parts of a saturated solution of potassium oxalate, mixed with 1 part of a saturated solution of ferrous sulphate, the other (II.) portion of the strips developed in the same developer diluted with an equal volume of water. Columns III. and IV. represent other experiments, the plates being developed with the saturated solution. Whilst I. to IV. were developed with a small amount of bromide of potassium added to the developer, No. V. was developed without bromide. In not one instance did the density of the unexposed portions of the plate amount to more than 0·098, which is the density due to clear glass and gelatine. That ferrous oxalate does not, however used, attack silver bromide which has not been exposed to light is a most valuable and characteristic property of this developer.

(*To be continued.*)

INTENSIFYING NEGATIVES. — Dr. R. S. Liesegang recently published a new and interesting method of intensifying negatives by which no damage is done to the negative, as is often the case. This process is, first, to varnish the negative in the usual way, after which he again coats it with collodion or varnish, in which has been previously dissolved red or green colouring matter of an aniline nature which is sensitive to light. On exposure to direct light through the negative, the clear parts are bleached out, while the half tones and blacks change only in proportion to the density of the different parts. The principal objection to be urged to this method arises from the fact that the aniline colours will gradually fade as prints are made from the negatives so treated, and the process then has to be repeated; but Dr. Liesegang suggests that some of the iron salts, such as are employed in the making of the ferro-prussiate paper, may overcome this difficulty. If such salts were used, however, the negative would have to be re-developed. —*Anthony's Bulletin.*

* Continued from page 695.

INSTANTANEOUS PHOTOGRAPHS OF WATER JETS.*

BY LORD RAYLEIGH, SEC.R.S.

A battery of Leyden jars was charged by a Wimshurst machine, and discharged itself between brass balls held about half an inch apart in the optical lantern. By means of a large condenser a good proportion of the light was concentrated upon the lens of the camera. The jet of water regularised by a tuning fork fell in front of the condenser and was focussed upon the photographic plate. In the absence of anything to diffuse the light, the pictures formed were simple shadows, such as had been obtained without any optical appliances by Mr. Bell and Mr. Boys. The only "detail" was due to the lens-like action of the jets, and the drops into which it was resolved. This arrangement was quite sufficient to illustrate the mechanism of electrical jets. But the interposition of a plate of ground glass close to the condenser effected a great improvement in the pictures of bringing out half-tones, and the results printed on aristotype paper were now very good. The only difficulty was that due to the loss of light. In some of the experiments it was found most advantageous to diminish the diffusion by slightly oiling the ground glass. The degree of instantaneity required depended upon circumstances. In some cases the outlines would have lost their sharpness had the exposure exceeded one-ten-thousandth of a second; and it was probable that the actual duration of the principal illumination was decidedly less than that.

Correspondence.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

Sir,—The members of the Haltwhistle Photographic Society and the above Association will have an out-door meeting to Gilsland, Naworth, and Lowercost, on Thursday, the 18th September. *Leader*—Mr. M. Auty, of Tynemouth. Train leaves Newcastle at 6.25 a.m. for Gilsland station.

Edgar G. Lee *Hon. Sec.*

11, *Beverley Terrace, Cullercoats, September 6th.*

EXHIBITIONS AT THE CAMERA CLUB.

Sir, —Would you kindly note that the sixth of the series of One-Man Photographic Exhibitions at the Camera Club will be open for private and press view on Monday, October 6th, at 7.30 p.m., and on and after Tuesday, October 7th, it will be open to visitors on presentation of card.

The Exhibition will consist of photographs by Mr. Lyd. Sawyer, of Newcastle-on-Tyne, by whose kind co-operation we are able to exhibit a fully representative collection, including much new work prepared specially for this Exhibition. The pictures will be on view for about two months.

G. Davison, *Hon. Sec.*

Camera Club, 21, *Bedford Street, W.C., 10th Sept.*, 1890.

PHOTOGRAPHING AT FRENCH SEAPORTS.

Sir,—I notice in your current issue, and also in several recent ones, an article advising readers to undertake photographing in French seaside towns. May I beg you to permit me, as one who knows France and its people very well indeed, to state that a more dangerous and risky undertaking could scarcely be found. The laws of France absolutely forbid photographing or sketching any portion of fortified towns, or any roads or ways leading to them, and a very wide range is given to the meaning of such phrases. True, the "spy" idea has partially waned, but photographers have been quite recently exposed to gross insult and detention in police offices.

France swarms with petty functionaries of incredible ignorance, and bursting with official importance, who have repeatedly caused the arrest and most troublesome detention of photographers.

I should think no more risky undertaking, in its way, could be undertaken than attempting to take views of old gates, &c., such as you refer to. Nominally, in Paris, full permission has been given to take photographs in the streets; but a gentleman was last week requested to go to the Police Office for doing so, detained all day, and on dismissal and returning to his hotel, found an insulting reception, and that the police had searched his luggage. Better far go to Belgium or Holland, amongst friendly people, who give a warm welcome to the English amateur. F.

[This letter is founded upon a misquotation. Photographing at French seaport towns has always been described in these pages as dangerous work, and what was stated last week, in relation solely to Calais, consisted of information recently derived from English authorities constantly on the spot. The tax upon every passenger landing at and leaving Calais is "eighteenpence," not "eightpence," as printed last week in error. The French have not yet broken free from the ancient, rigid, bureaucratic system, which reduces the liberty of themselves and of visitors.—Ed.]

Proceedings of Societies.

London and Provincial Photographic Association.

September 4th.—Mr. T. Bolas in the chair.

Mr. F. W. Hart exhibited a lantern screen; the frame was of bamboo in lengths fitted with screw points; it had the merit of allowing the sheet to be fixed at an angle, when occasion required that the lantern should be tilted. By a re-arrangement of the frame work, it could be converted into a portable studio for the garden, and also used for suspending magnesium flash-light lamps for out-door work.

Mr. A. Cowan showed two plates that had received sensitometer exposures. In one case the plate had a preliminary exposure of half a second, eight feet from a gas burner; this plate registered a much higher reading. A second set of sensitometer exposures was made. One of the plates, after development, was exposed to white light, when further development of higher sensitometer numbers was noticeable. Mr. Cowan did not think all plates in a condition to receive preliminary or supplementary exposure; the latter he considered might be an advantage when used in the case of a hopelessly under-exposed plate. Preliminary exposure should always be shorter than the normal working exposure.

The South London Photographic Society.

At a meeting held on Friday, September 5th, Mr. F. W. Edwards was in the chair.

The business of the evening consisted of a demonstration of "Mounting and Finishing Photographs," by Mr. C. Hoddle, in the course of which he showed practically how to prepare self-adhesive mounts.

A hand-camera by Crouch and Co., together with specimens of the work done by it, were handed round.

During the evening five additional candidates were proposed as members.

Sheffield Photographic Society.

A meeting of the above Society was held in the Masonic Hall on September 2nd, with Mr. B. J. Taylor in the chair. A goodly number of the members of the Rotherham Photographic Society was present.

The Chairman announced that Mr. Leadbeater, of the Rotherham Photographic Society, had presented the Society with a photograph of the members and friends at the Bolton Abbey excursion.

Mr. Howson gave a practical demonstration on the subject of "Printing on Alpha Paper." He began by describing his apparatus for always exposing the same or any required distance

* Read last Tuesday before Section A, British Association.

from the light, which consisted of a movable base-board, marked in inches, which held the printiug-frame. After exposing several prints with various exposures, he proceeded to develop the same, showing the latitude of exposure.

LEWES PHOTOGRAPHIC SOCIETY.

THE annual meeting was held at the "George and Dragon" on Tuesday eveniug, when Mr. J. G. BRADEN presided.

The financial position of the Society proved to be satisfactory, the balance-sheet for the year showing a balance in hand of £11 10s. 3½d. There was a balance in hand from last year of £2 0s. 1d.; the subscriptions amounted to £11 5s., and the balauce from the Photographic Exhibition added to the funds of the Society the sum of £4 16s. 1d. The total expenditure for the year was £6 10s. 10½d.

The SECRETARY then read the following report:—"The Society still contiuues to prosper, numbering at present forty-five members against thirty-eight in the previous year. The treasurer's report is satisfactory, showing a balauce in hand of £11 10s. 3½d. This large amount, however, is owing to the sum of £4 16s. 1d. balance from the exhibition account. Ten ordinary meetings have beeu held duriug the year, which have been fairly well attended. The council would like to see more interest taken in the exeursions, which have not been well attended this season. The purchase of a lantern for members' use and also a book-case for the Society's books, has beeu contemplated for some time, and will be carried out as soon as possible."

The report and balance sheet were unanimously adopted.

The following is the list of offieers elected:—*President*—Mr. J. G. Braden. *Vice-President*—Mr. J. Tunks. *Hon. Secretary*—Mr. E. J. Bedford. *Committee*—Messrs. P. J. Morris, E. Miller, C. R. Wells, C. J. Wightman, and Mr. Funnell.

Mr. Potter (Brighton) was elected a member of the Society.

The SECRETARY reported that no entries had been received for the quarterly competition, which was considered to be due to the very unfavourable weather which had prevailed.

At an excursion held by the Brighton Photographic Society on Saturday, at Hayward's Heath and Balcombe, the Lewes Society was represented by Mr. E. J. Bedford. There were ten cameras at work.

Mr. A. H. C. CORDER will read a paper at the next monthly meeting on "Printing Processes."

PHOTOGRAPHIC CLUB.—The subject for discussion on September 17th will be "Extemporised Modifications of Cameras"; September 24th, "Photographing Interiors." Last out-door meeting of the season on Saturday, September 20th, for Hampstead Heath; meet at Flagstaff at 3; tea at Bull and Bush at 6.30.

PHOTOGRAPHING AN EXPLOSION.—We note from our exchanges an account of a most eourageous and interesting experiment in the way of photographing the explosion of a 250lb. charge of dynamite from a dangerously close point of view. The seene of the explosion was in Savin Hill, near Boston, and the negative made by Dr. George H. Bailey, of that city, who succeeded in obtaining a most interesting negative of the *débris* just as it reached the highest point in its ascent. He sueceeded in getting himself and camera out of the way only just in time to escape serious damage from falling rock.—*Anthony's Bulletin.*

RECEIVED.—From Gauthier-Villars et Fils, "Traité Practique de la Deterumination du Temps de Pose." The author (M. de Chapel d'Espinassoux) acknowledges his indebtedness to previous writers on the subject, and claims to have produced a work specially adapted for those who are unfamiliar with physico-chemical science and mathematical formulæ. The book, though elementary, is complete, dealing with both theory and practice, and contains thirteen useful tables, besides a well-arranged index.——Under the title "Names we Love and Places we Know," Messrs Hazell, Watson, and Viney issue a birthday text-book of literary gems, which is so arranged as to serve as an autograph album, and a souvenir of holidays spent with the camera. The book is handsomely got up, and well suited for a drawing-room volume.

Answers to Correspondents.

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

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

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

M. D.—*Dry Plate Developers.* You will find the information on page 698 of last week's NEWS, where the relative proportions of sulphite to eikonogen are tabulated by Mr. F. C. Beach.

A. W.—*Phototypic.* We have no information beyond the reference to the fact that the amateur's outfit is to be had in Paris, as stated by Mr. Julius Sachse on page 653. If procurable in this country, you might enquire of Mr. Walter S. Bird, of the Autotype Company, 74, New Oxford Street, W.C.

T. V. C.—*Chart of the Aniline Products.* Only indirectly are we interested in your undertaking, but we take note of the announcement that the chart may be obtained at No. 2, Bond Street, Leeds.

A. B. (Preston).—*Fading by Sun Exposure.* Twelve months is a period long enough to bring about very serious bleaching by exposing prints on mauve paper to direct sunshine in a show-case. Those of shorter duration—four months—are not so seriously affected, which is in accordance with the probabilities of the case.

ROBERT LEWIS.—*Photography at Virginia Water.* We cannot believe that any question will arise. It will not even be necessary to put the enquiry to the landlord of "The Wheatsheaf" before going on to the ground and pitching your camera, for you can get access another way.

R. M.—*Blue Prints.* It seems impossible to help you further in this matter. If none of the dealers mentioned are open to make an arrangement with you, it might yet be advisable to insert an advertisement, asking for a partner to assist you in bringing out the paper for commercial use. There ought to be a demand for both sorts.

W. P. (Birmingham).—*Wet Plate Developer.* The advantage of hydroquinone does not come out so clearly as the older practice with pyro. Try a one-grain solution of pyro with acetic acid added, and a little alcohol to promote the easy flow of the developer. Alkaline development need not be resorted to, and is a positive disadvantage.

T. N. (Reading).—*Blisters on Albumenised Prints.* The paper is at fault, and complaints have been numerous of late. See recent replies. Avoid too sudden trausition from a stroug solutiou of hypo iuto pure water by interposiug a more dilute fixing bath before proceeding to wash the prints. Another plan is to use salt brine as the intermediate washing bath, but this is not so successful iu practice.

AULD RIEKIE.—*British Association.* The meeting stands adjourned to the 19th August, 1891, at Cardiff, Dr. William Huggins, F.R.S., having been elected presideut. The next followiug year will find the members assembling in your town, at a date which has not yet been definitely fixed.

C. W.—*Photographs of Volcanic Eruptions.* A series of Vesuvius, Stromboli, and Volcano, Lipari Islands, were shown on Monday last, in the Geological Section, British Association, by Dr. H. J. Johnston-Lavis, who photographed the craters in active state of eruption during the last and present years. The outburst of vapour and lava is wonderfully well rendered in several of the plates.

RECEIVED.—Colonel J. Waterhouse, T. Forest, B.H.L., Taunton, A. G. Greeu, and another correspondent.

MR. JOHN JAMES SPENCER informs us that he has completed arrangements for the acquisition of the business carried on by his father, the late Mr. John Spencer, which will be carried on by him exactly as formerly, under the old name. Mr. J. J. Spencer was for many years associated with his father in his business, aud latterly had had the entire management.

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CONTENTS.

THE CHANGING BAG.

In spite of the introduction of improved films for the support of the negative image, with all the manifest advantages which they possess in freedom from breakage, absence of halation, and reduction of bulk, the sale of glass plates does not seem to suffer any abatement, and it is probable that if enquiry could be made, it would be found that manufacturers have been this season busier than ever. A radical change, such as that which would be indicated by the general adoption of celluloid in lieu of glass, and which is not actually a necessity, must bow to the consideration of expense. Those who are already equipped with good apparatus fitted for the reception of glass plates—and in some forms of changing boxes nothing but glass can be used—naturally hesitate before they launch out into costly alterations, and are wise in asking themselves beforehand how the change is likely to repay them. They are also apt to remember that the price of the glass plates compares very favourably with that of films, so that alteration means not only a capital charge, but involves a constant increase in the cost of negative production.

Seeing, then, that glass still holds its own, it will not be out of place to call attention to a most useful piece of apparatus, which every touring photographer should carry with him as part of his kit. We mean a simple form of changing bag, for filling or emptying double backs, without the necessity of having recourse to red light. Such a bag can be bought ready made, or can be made at home by willing fingers.

The first necessity in a changing bag is that it must be light-tight, and although it may seem superfluous to insist upon such an obvious point, we do so because it is a condition which is not quite so easy to fulfil as it at first appears. The material must be soft, so that it can be packed into small compass without injury; and unfortunately most materials of this nature are full of interstices through which light can easily find its way. Mackintosh cloth would seem to be free from this objection, but it will not bear rough handling without cracking, and it has a tendency to get sticky if subjected to heat, or if packed away unused for a time. The best way to surmount the difficulty is to employ several layers of fabric, and for some of these to be of a non-actinic colour. Italian cloth does well for the outside and inside surfaces, while sewn between these may be two layers of yellow or red material, and the sewing must be so done that no needle pricks will admit light to the interior.

Perhaps the best shape for the bag is square, the size being governed by the size of the plates to be changed therein, eighteen inches being ample for quarter-plate work. The pattern may be cut out of paper in the form of a square, with two of the corners at one side cut off. It is at these corners that short sleeves are attached, which, in the case of the quarter-plate size, need not be more than six inches long. These sleeves should have india-rubber bands sewn round them both at the outer orifice and at the shoulder, so that when the arm is inserted there is a grip upon the limb at two places. Care must of course be taken that the opening of the sleeve is sufficient to pass a double-back and a box of plates in or out without difficulty.

We have seen changing bags of far more elaborate pattern, in which there is a red window and an orifice opposite, through which the eyes can watch the operations going on within. Every such addition means risk of fogging, and in practice it will be found that all necessary manipulations can be carried out by the sense of touch alone. Of course there are horny-handed individuals who cannot distinguish things in this manner, and who find it impossible to differentiate between a peach and a brickbat; but the majority will soon learn easily to carry out the necessary work without the exercise of eyesight. At first there will be some little difficulty in distinguishing the gelatine side of the plate from the reverse, but the touch gradually becomes so educated in this respect that a mistake seldom or never occurs. The film has an unmistakably dry surface, while the glass is felt to be steamed, to a slight extent, by the touch of the warm hand. But

even this test may be disregarded if the attention is wholly fixed upon the operation in hand, and if the worker will bear in mind that the plates are packed in a certain order—generally film to film.

Do not attempt to use the changing bag in the open air, for, with the greatest care, light will sometimes stray through the sleeve, especially if the coat cuff should get displaced. It is best to place the bag on a table, and to sit in front of it facing the window. Thrusting one arm through its sleeve, the plate-box, the double backs, and an empty box—if required—for exposed plates are pulled through the other opening. The other arm is now inserted, and, without any difficulty, the plates can be handled and placed in the backs, or out of the backs into the spare box. It may be pleaded that, as the use of a dark room can generally be had for the asking, such a contrivance need not find a place in the photographic kit. It is true that there is now little difficulty in finding a dark room, even in the smallest town. But at the moment when wanted it may be occupied, or the owner may be away, or other difficulties may crop up. It is far better to be independent of outside aid, and when this independence is secured by the nominal addition to one's luggage of a small bag that weighs only a few ounces, it is purchased cheaply indeed.

PHOTOGRAPHY AT THE EXHIBITION OF THE MEDICAL CONGRESS IN BERLIN.*

AMONGST the interesting applications of photography is a representation by Professor Exner of the retinal image of the eye of a glow-worm. As is known, the eye of an insect is differently constructed from that of a human being, for, whilst the latter possesses a lens that, similarly to a photographic objective, projects an inverted image upon the retina, the eyes of insects are formed of a number of facets like small mosaic work, which are connected by tubes, each with the end of a nerve sensitive to light. The picture, as a whole, is similar to that which is projected by a small opening, only that it is not inverted, since it consists of an aggregate of very small sections corresponding with those of external objects.

The firm of Burstet and Fürstenberg presented the Exhibition with a series of glass pictures for projection in the lantern. They exhibit enlargements of anatomical, zoological, and botanical preparations printed upon gelatino-chloride of silver, and of singular delicacy. We have ourselves had the opportunity of examining the installation in the laboratory of these gentlemen. For considerable enlargement a microscopic objective is employed, and for those of a less degree the system of Hartneck is adopted, as in the laboratory of Charlottenberg.

The embryological photographs of Professor Hiss evidence the most perfect work. We must admire as much the skill of the dissector as the excellence of the photographic work.

A unique series of photographs is that shown by the Hygienic Institute of the University of Kiel (Prof. D. B. Fischer). As is well-known, certain unclean objects—fish-bones, decaying wood, crabshells, &c.—under some circumstances exhibit a vivid, phosphorescent light in the darkness. It was formerly accepted that this development of light was due to a slow oxidation of the decaying body. With the help of the microscope it was, later on, recognised that the light given out by these objects is due to colonies of a fungoid growth (bacteria), and that these bacteria, like the glowworm and the shining animalculæ of the sea, possess self-luminous properties. Prof. Fischer has now succeeded in photographing these bacteria by the light which they diffuse. This is so much the more remarkable an achievement as the light emitted is, both optically and chemically, exceedingly feeble.

Professor Cohn, with whose magnesium flash pictures of diseases of the eye our readers are acquainted, showed his "Rhomboidal" camera. This camera has, internally, an arrangement by which the rays collected by the objective are divided into two parts, so that by a single objective two neighbouring images are projected. By this means it is possible to get the image very sharp at the moment of taking the photograph. This is attained by means of glass prisms, in which the light is twice totally reflected. It may be further observed that the object of Cohn's apparatus may be effected in a much simpler manner, and without sacrificing the light from half of the objective. Another method, for example, is very advantageously seen in Loman's reflecting camera; and in the "Rhomboidal" camera itself, by another arrangement of the prism one of the reflections can be dispensed with.

Of very general interest are the photographs which Prof. Von Virchow shows of acrobats and contortionists. The muscular formation of these individuals stands forth so abnormally, that only by photographs is adequate representation practicable.

The photo-chemical laboratory of Charlottenberg is also represented by photographs of the spectrum made by Dr. Wollheim. The chlorophyl spectra exhibited by this gentleman are technically very perfect and characteristic.

The Legroin incandescent gaslight, so much in use in Austria, is shown applied to an enlarging apparatus by R. Leichner. Unfortunately we have not been able to see any proofs of its work and capability.

The foregoing may suffice to give an idea, though an imperfect one, of the accomplishments of photography in medical science. We may, from what we have seen, draw the conclusion that in this direction photography has achieved great triumphs, but that its application is as yet much too far from being general. In a great number of cases the laborious, uncertain, and subjective process of drawing is still employed, a process which has been ridiculed for more than twenty years. We have seen magnificent and immensely laborious drawings at the Exhibition, but ever so defective a photograph puts them into shade in the matter of accuracy.

* Concluded from page 665.

THE taste for water-colour painting possessed by the late Prince Consort, by the Princess Louise, and by the Princess Beatrice, is shared by the present Emperor of Germany, who, however, prefers oil as a medium. He has painted some very tolerable studies of Norwegian scenery on the panels of the ante-room in his State yacht. An imaginative attempt at "the Sea Serpent" is less successful. In another room are interesting and apparently life-like portraits of Prince Bismarck and Count Moltke, which appear, however, to have been reproduced from a photographic copy, and not from life. His Majesty is a better draughtsman than a colourist.—*The Artist.*

Literary Notices.

Die Mikrophotographie als Hilfsmittel Naturwissenschaftlicher Forschung. Gottlieb Marktanner-Turneretscher (1890: *Knapp, Halle*).

Micro-photography, as an aid to scientific research, has been illustrated in a very important manner at the recent Exhibition held in connection with the Medical Congress recently sitting at Berlin, and the continually increasing use made of micro-photography as a handmaid of science ensures a welcome to such a comprehensive and thorough hand-book as that of Herr Marktanner-Turneretscher, a hand-book which not only deals thoroughly with such matters of detail in the use of instruments as it is essential for a micro-photographist to master, but, with the characteristic thoroughness of the German bent, contains in a second part such photographic information as is necessary for the microscopist entering upon this branch of research to be acquainted with. So that, whether the reader is already a photographer, already a microscopist, or one unacquainted with either science, he need not go beyond the present manual for the information that he will require.

Half-a-dozen pages of historical and introductory matter, in which the early work of Davy (1802), Reade (1837 and 1839), Shadbolt, Wenham, and others are referred to, bring us to the essentially practical portion of the work, in which photo-micrography is studied in its various aspects, this part occupying over two hundred pages; whilst the remainder of the book, a hundred or so pages, is devoted to the definitely photographic instruction and details to which we have already referred.

The author recommends the compact and convenient "Zeiss" form of microscope so much employed on the Continent, and indeed very much in present use in our own medical and histological schools, and describes a slightly modified form made by Dr. Zeiss especially for photomicrographic work, the outer draw tube being of extra size (for photographic use without the eye-piece), although it will take the usual inner tube, with the millimeter scale as now engraved on all the newer instruments. The instrument is thus equally well adapted for ordinary microscopic work for photographic use, whether with or without an eye-piece.

Another advantage of the larger body tube of the Zeiss special form is that, when using objectives of very long focus, the lens can be attached to the inner draw tube, and so the requisite distance of the stage can be readily obtained, the larger body tube serving incidentally also as a shade. A light mechanical stage, with two graduated scales, serve to enable the position of any object on a slide to be registered, and a circular motion gives facility for bringing any part of the field to the top of the sensitive plate.

As regards objectives, the author points out that except in the case of instruments made specially for photographic use—and from what he says of the latter we infer that, on the whole, he prefers to use ordinary objectives—it is quite necessary to test for any difference that may exist between the position of the visual and the chemical foci, as the variation in this respect is quite independent of the reputation of the maker, and of the price of the combination. Still, in some cases this labour may be avoided by using monochromatic light, which may be green, blue, or yellow; the latter, however, being more especially useful for heightening the contrasts of slightly coloured preparations.

The exhaustive and well illustrated descriptions of the various arrangements of apparatus suggested and used is very instructive, and the photo-micrographic worker, even if he does not understand the German language, who can glance at the illustrations without getting some useful idea must either be very unobservant, or have already accumulated a very large store of knowledge of the subject.

As regards various means of illumination, the work is well up to date, showing intimate acquaintance with the latest improvements; the achromatic condenser of Zeiss, and the less complicated instruments of Abbé, of Seibert, and of Klonne and Muller being treated of, together with optical means (prismatic apparatus) for obtaining monochromatic light. After this we find several forms of heliostat described, and then we come to instantaneous shutters, the quickest of which are required in some cases when the electric arc is used as the source of illumination, a source far more convenient than that uncertain supply which those who work by sunlight employ. A simple carbon holder is described consisting of a shaft worked by hand on which is cut two threads, one right-handed and the other left-handed, and of such different pitch as to correspond with the consumption of the positive and negative carbons respectively. For steady work, however, our author recommends the positive motor lamp of Von Hefner Altneck (Siemens), and on page 125 he figures this in combination with a complex condenser system which is worth the study of those desirous of working in the highest attainable class. We also find details for using a small incandescent lamp which may be placed very near the object either for "over" or "under" illumination, much facilitating the work of the ordinary microscopist.

A comprehensive bibliography and a good index are useful features, and the whole work is a characteristic example of the thorough way in which German scientific men delight to complete as far as possible the work they undertake.

Custom House Examination of Baggage.—Travellers who have just returned from their autumn holiday must be disgusted to think that they did not wait a little longer before returning to harness. Dating from the present week, the stringency of the regulations respecting the search of passengers' baggage has been greatly relaxed, by order of those semi-mythical personages, my Lords of the Treasury; and, therefore, it will no longer be considered absolutely necessary for the well-being of this realm that one's shirt-fronts should be scrabbled by the inquisitive and unsympathetic claws of a Custom House official. The harmless and unnecessary amateur photographer will especially rejoice, for, in certain tents of the Philistines, to be an amateur anything is to court the treatment usually meted out to a mad dog, and the practical joker in office will no longer be able to insist on exposing a box of cherished but undeveloped negatives to the autumnal sun. The discomfort and annoyance experienced by many homeward-bound travellers during the last six years must be included in the little debt of gratitude we owe to the Irish-American patriots who were in the habit of bringing dynamite in their luggage in those occasional deviations from humanity, which seem so trifling to the man out of reach of the infernal machine; but now that most of these scoundrels are enjoying a well-earned repose in Her Majesty's prisons, the strictness of the search may safely be relaxed. Undoubtedly this right of search by the Custom House officials is a salutary thing; but so few articles are now-a-days worth smuggling, especially in the small quantities possible in a passenger's ordinary luggage, that the ordeal should be made as little obnoxious as may be to the much-tried gentleman who has been crossing the Channel.—*Graphic.*

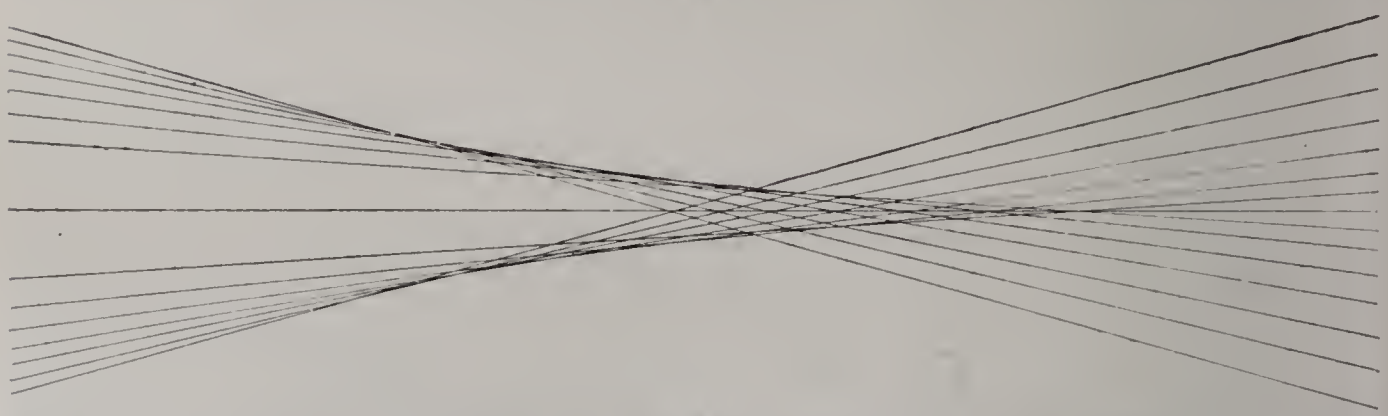
SPHERICAL ABERRATION AND DEPTH OF FOCUS.

BY W. E. DEBENHAM.

MR. THOS. R. DALLMEYER, in an article in the last issue of the PHOTOGRAPHIC NEWS, says that in the view that I have taken of the effect of the introduction of spherical aberration into a photographic lens, which agrees with that put forward by the late Mr. T. Grubb, I have been "misled" by that gentleman's diagram on the subject. Leaving for the moment the point as to which side of the question is supported by misleading propositions, the statement is singularly unhistorical, as my protest against the claim for increased "depth of focus" was made at the meeting of the Photographic Society of Great Britain in January, 1867, at which this claim was under discussion, a fact of which Mr. T. R. Dallmeyer can scarcely be supposed to be ignorant, whilst Mr. Grubb's protest and diagram were not issued until some weeks later, and were, indeed, very much called forth by Mr. Dallmeyer's reply to my criticisms.

Mr. Dallmeyer speaks of Mr. Grubb's diagram as containing a misleading error, and gives one himself which professes to be correctly disposed. He also professes to give a representation of Mr. Grubb's diagram. Between this representation and Mr. Grubb's orginal diagram, or the reproduction of it, illustrating Mr. Burton's article in the PHOTOGRAPHIC NEWS of the 1st of August last, there is a considerable difference. In Mr. Dallmeyer's representation there is the appearance of a long line of nearly equal illumination, which is very different from the effect seen in the original diagram, and even from Mr. Burton's reproduction of it. In both these, however, as well as in Mr. Dallmeyer's "correctly disposed" version, there is a suggestion to the eye of the observer who does not allow for the difference between linear and surface measurements, of a concentration of a greater part of the light along the centre than is actually available for building up the picture. In Mr. Grubb's case this suggestion was not material, as the diagram professed to illustrate the size of the circles of confusion. The question of concentration he disposed of by saying that any advantage in one direction was counterbalanced by loss in the other direction.

Mr. Dallmeyer's argument, however, is based upon this concentration, and the exaggeration of it is therefore material. Independent of the much greater concentration which exists in Mr. Dallmeyer's own and his version of Mr. Grubb's diagram than really existed in the latter, there is the fact that these diagrams only represent a section, and therefore only present a delineation of a line or band across the surface of the lens. Such a sectional drawing representing an equal amount of light passing through each linear unit of the diameter of the lens, presents to the eye an appearance of much larger proportion of light as passing through the centre of the lens and helping to build up the line of concentration, than is actually the case. The light, for instance, passing through the central inch of a 5-inch lens is represented as one-fifth of the total amount, whereas, in reality, it is but the one-twentyfifth. This is illustrated in the following diagram of spherical aberration, which does not represent the light passing



through a section of the lens, but represents the whole of the light passing through the lens gathered into one line, so as to show approximately the proportion transmitted by the centre and the outer circles for the formation of an image. The lines are spaced along the surface at points where each, as it recedes from the centre, would enclose an annulus of equal area.

This smallness of the proportion of light available to form the image along the axis of the lens is a phase of the case against spherical aberration that has not, I think, as yet been enforced. We are not dealing in portrait photography with a series of brilliant points, each against a black background, and each luminous enough to allow all but a small percentage of its light to be dispersed by the outer circles of the lens, whilst the residuum is sufficient to produce a definite image. In photographing a candle against a black background, for instance, if it be assumed that we might have ninety per cent. of the light passing through the lens spread as a halo round the flame, and still find a recognizable image in the centre, this argument would not apply to the lights indicating the hair, beard, &c., of a sitter in a properly exposed negative.

Mr. Dallmeyer, in his present paper, twice refers to me, as he has done before, as a photographer. That should scarcely be a term of reproach in the pages of the PHOTOGRAPHIC NEWS, and is quite beside the mark. If Mr. Grubb and I have been right in our contention—and I believe that no one but Mr. Dallmeyer denies this—it is of no consequence that the one was a distinguished optician, and the other a photographer interested in optical science, who, as long ago as the "sixties," constructed, for special purposes, photographic lenses, one of which was described in one of the journals of the time.

To come from theoretical to experimental tests, I some time since tried a "diffusion of focus" lens by photographing a test object, got up like Claudet's focimeter, but with such modifications as required by the case. These modifications were merely the use on each radiate arm of printed papers of four degress of fineness, and the arrangement of the arms, eighteen of them, at intervals of

an inch in advance of each other. Compared with the lens in corrected position—which was not, however, with the lens screwed quite home, when negative spherical aberration appeared, but unscrewed between two and three gradations—I could not find any increase in depth of focus, whatever amount of spherical aberration was introduced by separating the components. On my recently mentioning this trial at a meeting of the Photographic Society of Great Britian, Mr. Dallmeyer stated that the test was not a fair one.

It is difficult to see wherein the unfairness of such a test consists, or to find one more closely corresponding to the special case, that of large portrait heads, for which spherical aberration was particularly recommended. The test object was photographed at an ordinary distance for portraiture, and the various planes separated only by intervals of an inch each, round and near to the axial line of the lens, represent fairly enough, one might think, the various planes existing in a head photographed from nature.

A test, however, which Mr. Dallmeyer seems to consider fair enough for the purpose is published in the Conference number of *The Camera Club Journal*. An illustration by Mr. Dallmeyer here professes to represent images given respectively by an aplanatic lens, a lens with slight spherical aberration, and another lens with great spherical aberration, each at its best focus, and each at certain intervals from the focus in both directions. Plate 8 is marked "slight spherical aberration, best focus," whilst plate 9, representing the work of the same lens, is marked "inside focus $\frac{1}{10}$th inch." Similarly, plates 15 and 16 are marked respectively, "best focus," and "inside focus half inch." It is staggering to find that these marked as "inside focus" are actually in better focus than those marked as best focus, showing that the latter was not really the best focus, but that those which professed to be removed from the best focus by the distances mentioned were either themselves in the best focus, or were, at all events, more nearly so than those which professed to be taken at the focus. The fact, which will be evident to anyone who examines the plate, most strikingly in the case of 15 and 16, seems so astounding that I scarcely ventured to speak on my own observation till I asked the verdict of several well-known scientific photographers, whose judgment agreed decidedly with my own. Mr. Dallmeyer has overdone his proof; if the real best focus had been disposed about midway between that professing to be the best and the one at a certain distance, the thing might have passed undetected; but as it is, it serves as an illustration of how anything may be "proved" when it is desired to be so.

Wood Engraving in Eastern Schools.—The recent announcement of the Principal of the Cooper Union art schools to the pupils of the class in wood engraving, that hereafter there will be no instruction in that department, is most significant. The Hon. Abraham S. Hewitt, secretary of the Union, told a reporter of the *New York Sun* that he had made an investigation for the board of trustees, and had discovered that the wood engraving business had been destroyed by new processes, and was no longer able to afford a living to anyone not gifted with exceptional genius. It was the aim of the institution, he said, to adapt itself to commercial wants, and whenever any branch of instruction was discovered to furnish no longer a living to those who followed it, the study was to be abolished. For wood engraving, Mr. Hewitt said, instruction in pen and ink drawing would be substituted.

FAST AND FUGITIVE DYE STUFFS.*

BY PROFESSOR J. J. HUMMEL.

Colours may be classified with respect to their resistance to each particular influence, and may, as I have pointed out, occupy a very different rank in the different arrangements. The most important question to be considered is the influence of light on dyed colours, and to this alone I wish to confine your attention on the present occasion. It is well known that the sun's rays not only produce the sensation of light and heat, but also effect chemical action, either combination or decomposition. We know, further, that the most chemically active rays are those situated at the blue end of the spectrum, and it is doubtless these same rays which are the chief cause of the fading of dyed colours. Indeed, experiments have been made which prove this. Depierre and Clonet exposed a series of colours dyed on cotton to light which had passed through glasses stained red, orange, yellow, green, blue, and violet, corresponding to definite parts of the solar spectrum. They found that the blue light possessed the greatest fading power, red light the least. Abney and Russell exposed their water-colours under red, green, and blue glass, and also found that blue light faded the colours most, red light the least.

But the chemical activity of the sun's rays is not the only cause of the fading of colours. There are certain accessory or contributory causes of the greatest importance. Fifty years ago Chevreul carried out an elaborate series of experiments on the fading of the dyed colours of that day, and obtained some very interesting results which show what their accessory causes are, and I may add that his conclusions are confirmed by the recent experiments of Abney and Russell with respect to water-colours. Chevreul exposed samples of dyed silk, wool, and cotton to direct sunlight under varied conditions, *e.g.*, in a vacuum, in oxygen and hydrogen gas, in dry and moist air, and so on. Colours dyed with orchil, safflower, annatto, and indigo-extract were found not to fade during the course of two years if exposed to light in a vacuum, which is certainly a most striking and unexpected result, considering the acknowledged fugitive character of these colours. One or two colours, *e.g.*, Prussian blue and turmeric, faded even in a vacuum, but the general conclusion arrived at was that light, when acting alone—*i.e.*, without the aid of atmospheric agents—exercises a very feeble influence on most colours compared with what it does in conjunction with air and moisture. Further, it was determined that air and moisture have very little effect on colours without the aid of light. Abney and Russell, in their experiments with water-colours, obtained similar results. These conclusions, it appears to me, correspond exactly with our common knowledge of the old-fashioned method of bleaching cotton and linen, in which the wetted fabric is exposed to light on the grass, and frequently sprinkled with water. If the material becomes dry, through the absence of dew or rain, or the want of sprinkling, little or no bleaching takes place. They explain also, I think, the intense fading power of the Indian sun, namely, that it is due, not merely to the strong sunlight, but also to the fact that the air in India is so well charged with moisture. Another interesting result of Chevreul's work, and one not entirely unknown to practical men, is that colours are faster to light on some fibres than on others. For example: Indigo-extract blue is most stable on silk, least on cotton; vat-

* Continued from p. 712.

indigo blue is most stable on wool, least on silk; orchil purple is most stable on wool, least on cotton; safflower pink is most stable on cotton, least on wool. As to the reason of this different fastness, it has been suggested that it might be because the colouring matter is possibly in a different state of combination in the different fibres. The subject has, however, not been pursued, and I think we must confess that we are totally ignorant of the precise cause, but it is certainly important to remember this fact, that the fastness of a colour applied to one fibre is no index that it is equally fast when applied to another, and this may account, to some extent at least, for the discrepancies in the statements relative to the fastness to light of certain colours occasionally mentioned in the chemical journals. Perhaps one of the most striking effects of the action of light upon colours obtained by Chevreul was that in Prussian blue. Exposed to light, even in a vacuum, this colour fades; but, strange to say, on keeping the faded colour in the dark, but exposed to air, the blue colour is restored. Chevreul was able to show that during the exposure to light prussic acid was given off, and the colour was reduced to a colourless condition, while in the dark atmospheric oxygen was absorbed, with the formation of ferric oxide and the restoration of the blue. If the fading and restoring processes were repeated a great number of times, the colour would be at length destroyed entirely, leaving only ferric oxide on the fibre. Now, although the fading of Prussian blue in a vacuum is due to reduction, we know that with most other colours air and moisture play a most important part in the fading process, and it is very probable that in most cases the fading of colours is due to oxidation. During the evaporation of water in nature there seems to be formed ozone or hydrogen peroxide in small quantity, and both are powerful oxidising as well as bleaching agents. Now that we have such a large number of pure coal-tar colouring matters of known constitution, the rationale of the fading process offers an interesting field of research for the chemist. Turning now to another aspect of the question, we have, as you know, a large class of colouring matters which require the aid of mordants to develop and fix the colour upon the fibre, and it is well to know what influence the different mordants have upon the fastness of colours. In the dyeing department of the Yorkshire College it has been our custom to expose to light the coloured patterns dyed by the students, and I propose briefly to give you a few of the more prominent results obtained with respect to the influence of mordants. Some colouring matters are found to give fast colours with all mordants, *e.g.*, alizarin, madder, cochineal; others, *e.g.*, peachwood and young fustic, give always fugitive colours whatever mordant be employed; while others, again, *e.g.*, logwood, give fairly fast colours with some mordants, and fugitive colours with others. As a general rule, we find in the last-mentioned cases the tin and aluminium colours are fugitive, while those of copper, chromium, and iron are fast to light.

Knowing these facts, let us not fall into the error of supposing that it may be possible to discover a mordant capable of rendering all colours alike fast to light. Each colour of the class now referred to, in which a single colouring matter is combined with different mordants, represents really a distinct pigment or dye, each differing from the other in chemical and physical properties. All that we can do is to apply each colouring matter with all suitable mordants, and select that particular combination which gives the desired colour and fastness. By this method our selection would ultimately comprise a number of colouring matters paired with a variety of mordants. When dyeing compound shades, however, it is well to avoid the intricacy involved in the use of several mordants, if possible, and, although necessarily retaining the use of several colouring matters, to limit ourselves to a single mordant as far as possible, mainly in order to simplify the process of dyeing. In wool-dyeing, for example, since we have such an excellent mordant in bichromate of potash, it would be very desirable to have a good range of red, yellow, blue, and other colouring matters, all giving fast colours with this mordant. The problem, then, of producing fast colours is rather one for the colour manufacturer than for the textile colourist, and, indeed, in the so-called alizarin colours, we have already received at his hands a goodly range of fast-colouring matters, which makes it almost impossible for the dyer to dispense, if need be, with nearly every one of the dye-woods. In many cases questions of price render this entire abolition of old for new colouring matters impossible during this age of competition, neither would it be in all cases desirable. The textile colourist, however, can also do excellent service in the cause of fast colours by thoroughly examining the capabilities of all the colouring matters and mordants now at his command, and particularly by exercising a wise discretion in their combination and their use.

Unfortunately, here again trade competition steps in and mars the excellent results which might otherwise be obtained, and the general public suffers because this bane of modern commerce has too often compelled the dyer to employ colouring matters more or less unfitted for the material and its ultimate use. Some colours, we find, exhibit unusual qualities, *e.g.*, camwood brown, obtained by means of tin and alum mordants, becomes darker on exposure to light during the first month or two, and then begins to fade. Picric acid yellow presents similar features, the pure canary yellow of the fresh colour becoming rapidly orange, and this only fading after several months. The olive-green of Persian berries and copper mordant is remarkable by its becoming darker even after twelve months' exposure to light. It is interesting to inquire as to the action of light on compound colours. Is a fugitive colour rendered faster by being applied along with a fast colour? I am not aware that this subject has been carefully examined, but the result of general observation is, that when light acts upon a compound colour the unstable colour fades, and the stable colour remains behind. A woaded colour, for example, is only fast in respect of the vat-indigo which it contains. Indigo-extract and other fugitive colours are not rendered fast by woading. If there are exceptions to this rule, it seems to me to be only possible, when the fast and fugitive colouring matters simultaneously or successively applied, re-act chemically upon each other, in which case the resultant colour would really be due to a new colouring matter. Coming now to discuss the coal-tar colours, many of you are aware that, according to their chemical constitution, *i.e*, the arrangement of the various atoms composing them, chemists have arranged their colours in various groups, *e.g.*, the nitro-colours, the azo colours, and so on.

(To be concluded.)

THE *Review of Reviews* of Sept. 18th promises the preparation of a "catalogue of all the standard photographs at present on sale in the British Empire and the American Republic," the compilation of which it well characterises as an "immense labour."

ON THE REVERSAL OF THE NEGATIVE PHOTOGRAPHIC IMAGE BY THIO-CARBAMIDES.*

BY COLONEL J. WATERHOUSE, B.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

In the early part of last month, while carrying out some experiments to find a preservative for eikonogen, I discovered that phenyl-thio-carbamide (phenyl-sulpho-urea) added in a very minute quantity to the ordinary eikonogen developer, possessed the remarkable property of more or less completely transforming the negative photographic image into a positive, and that thus I was able to produce at will more or less perfect positive pictures in place of negative ones, under otherwise quite normal conditions of exposure in the camera and of development.

Later experiments have shown that allyl-thio-carbamide, or thio-sinamine, possesses the same property, perhaps in a stronger degree, and reverses the images developed with pyrogallol and hydroquinone, as also those developed with eikonogen. Thio-carbamide, or sulpho-urea, also produces reversal with the eikonogen developer, but not so markedly as the two alcoholic thio-carbamides. Carbamide, or urea, appears to cause no reversal with the eikonogen developer; and this observation, if confirmed by further investigation with other developers, would tend to show that sulphur has an active part in bringing about the reversal.

I have also found that the phenyl and allyl-thiocarbamides, when applied to precipitated bromide or chloride of silver, or to gelatine dry-plate films containing them, have no visible action upon them; but, if an alkali be added, a powerful darkening and reducing action is set up, even in the dark and entirely without the action of light. With the iodide this action is not so strong.

Thio-carbamide with alkali gives off ammonia and darkens and reduces the silver haloids; and a strong solution of it is capable of darkening a gelatine plate in the dark even without alkali.

Urea, even with alkali, does not visibly darken a gelatine dry-plate film, nor darken or reduce the silver haloids in the absence of light.

So far as I can ascertain, these peculiar actions of the thio-carbamides, in reversing the photographic image and in darkening and reducing the silver haloids in the absence of light, have not before been noticed.

The thio-carbamides of the alcoholic series are formed by the action of ammonia on the so-called "mustard oils," or thio-carbamides. *Phenyl-thio-carbamide*, formed from phenylic mustard oil, has, according to Watts, the formula $CS\begin{matrix}\diagup NH.\ C_6H_5\\ \diagdown NH_2\end{matrix}$.

It is a crystalline substance, very slightly soluble in cold, more easily in boiling, water and in alcohol. Watts further remarks that, when boiled with nitrate of silver, it exchanges its sulphur for oxygen, and is converted into phenyl-carbamide.

Applied by itself in solution to an ordinary gelatine dry plate containing bromide or bromo-iodide of silver, it has no visible reducing action, and, indeed, appears to act as a restrainer of development; but mixed with an alkali, such as sodium or potassium carbonate, it very powerfully darkens the film, even without the action of light. When fixed, the darkened part of the plate is of a deep yellowish olive colour, and is harder and less absorbent of water than the unaltered part of the film. The darkening action is the same on a gelatino-chloride of silver film, though I have not succeeded in obtaining the reversal of the image on chloride films developed with eikonogen, as noted below.

The alkaline solution of this thio-carbamide also darkens and reduces pure bromide of silver in the dark; and, if the darkened precipitate be treated with nitric acid, it clears in colour, and by the addition of muriatic acid to the clear fluid, chloride of silver will be precipitated. Eikonogen developer added to the darkened precipitate blackens it, and if, after washing the latter, nitric acid be added, only a very little unaltered bromide is left, together with a flocculent, brown, insoluble deposit.

Weak solutions of phenyl-thio-carbamide act more effectively in reversing the image than strong ones, and with the eikonogen developer the best proportion seems to be about 20 to 25 parts of the watery saturated solution in 100 parts of the mixed developer; and as a saturated solution in water, even at the comparatively high temperature we now have in Calcutta, seems to hold an almost inappreciable quantity of the salt, the proportion actually contained in the developer must be exceedingly small.

The eikonogen developer I have usually employed is that recommended by Dr. Nicol, which was given in the June number of the *Journal*, and contains sulphite of soda.* I have not found that the presence of this salt interferes, as might have been expected, with the reversal, and am inclined to think that its presence in moderate quantity is beneficial, though good reversals may be obtained with plain eikonogen and carbonate of soda.

The addition of a small quantity of potassium bromide (from ·5 to 1 part of a 10 per cent. solution to about 100 of developer) seems to aid in the reversal of the lights. In some cases a trace of ammonia also seems to be beneficial in aiding the complete reversal.

So far I have not found phenyl-thio-carbamide to have the same action of reversing the image when used with the ferrous oxalate, pyrogallol, or hydroquinone developers, as it has with eikonogen. With ferrous oxalate I have obtained traces of reversal. Applied in different strengths to an exposed dry bromide plate and developed with pyrogallol (Britannia formula), it acted as a powerful restrainer. It did so also with ordinary pyro-ammonia and bromide, and stained the plates a deep yellow. With the hydroquinone developer its action was quite different, and it appeared to be a powerful accelerator, reduction taking place over the touched parts, which, in fact, were fogged all over before the normal image was developed. No signs of reversal were obtained with this developer, but it is probable that with further investigation it will be found to reverse, as it does with thio-sinamine.

It may be here noted that different makes of plates show different capabilities of reversal, and, so far as my experiments have gone, Wratten's "Ordinary" and "Instantaneous" plates have given the best results; but, possibly, variations in the quantity of thio-carbamide and of bromide will have to be made for different makes of plates.

Apropos of this, I may remark that, now that dry plates are so invaluable, and so largely used for scientific researches of all kinds, it would be a great convenience, at any rate to distant workers, if dry-plate makers could

* From the *Journal of the Photographic Society of India*.

* A.—Eikonogen, 5; Sodum sulphite, 10; Water, 100. B.—Sodium carbonate (cryst.) 8; Water, 100. One part each of A and B to two parts of water.

indicate on their dry plate packages the nature and proportions of the haloid salts used in the emulsion.

Thio-sinamine, or *Allyl-thio-carbamide*, according to Watts, has the formula $CS<^{NH.\ C_3H_5}_{NH_2}$, and is prepared by treating allyl-thio-carbamide, or the essential oil of black mustard, with ammonia. It is more soluble in cold water than the phenyl-thio-carbamide, and is also soluble in alcohol. In some of my experiments I have used an almost saturated solution of the thio-carbamide formed by adding four parts of the strongest liquid ammonia to one part of the ordinary essential oil of mustard obtained from the druggist. As soon as the ammonia has taken up as much of the oil as it will, the solution may be decanted off, and the ammonia allowed to evaporate. Of the solution thus prepared about one part in 100 of the mixed eikonogen developer as above is sufficient to produce reversal on development; a little bromide may be added, and a slight trace of ammonia seems beneficial.

This solution has rather an unpleasantly strong smell of old cheese and garlic, and it is advisable to evaporate it, and obtain thio-sinamine in a crystalline and odourless form, in which it may also be purchased in Europe. Of the saturated solution of the crystals, from half to one part in 100 parts of the developer is enough.

The reversing action of the thio-sinamine seems to be stronger than with the phenyl-thio-carbamide, and it gives clearer whites. The colour of the images produced with it with eikonogen alone, without bromide or ammonia, is a beautiful rich chocolate brown verging to purple. It has given a very fair reversal with pyrogallol developer containing sulphite, though it did not do so with a pyro-ammonia developer prepared according to the "Britannia" formula with nitric acid, and a considerable quantity of bromide. With Thomas's hydroquinone developer it also did not reverse the image; but with a developer prepared with—

Hydroquinone	1 part
Sodium sulphite	2 parts
Carbonate of soda (cryst.)	10 ,,
Water	70 ,,

I obtained very clear reversals in copying, though I was not so successful in a landscape with considerable contrast between the sky and foreground. With eikonogen, also, the thio-sinamine seems to work best with sulphite.

Applied to pure precipitated bromide of silver in the dark, thio-sinamine does not darken it, but seems to enter into combination with it, forming a soft, pasty mass, and, if in sufficient quantity, dissolves it. Carbonate of soda solution darkens the soft mass at once, and the solution treated with dilute muriatic acid gives off a smell of sulphuretted hydrogen; nitric acid partly and slowly restores the colour. With muriatic acid the nitric acid solution gives chloride of silver. A very peculiar smell was evolved by the mixed acids. Eikonogen developer added to the darkened precipitate after treatment with soda turned it quite black. Nitric acid caused effervescence, and made the precipitate lighter in colour. It appeared to be a mixture of yellow bromide and a black substance with a little flocculent deposit. Muriatic acid added to the nitric acid solution gave a copious precipitate of silver chloride.

The alkaline solution applied to chloride of silver also darkens it very strongly. Nitric acid does not clear the precipitate much, but the solution gave a copious precipitate of chloride with muriatic acid. The action generally is much the same as with the bromide.

With silver iodide, thio-sinamine also forms a soft, waxy mass, and dissolves it. Carbonate of soda only very slightly discolours the mass, with the dirty yellow appearance of a sulphur compound of silver. Nitric acid set up a strong effervescence and nitrous fumes, and restored the iodide to its original colour. The acid solution gave no precipitate with muriatic acid, but the same peculiar smell as above.

These compounds of thio-sinamine with the haloid salts of silver seem very curious, and might be worth investigation by a more experienced chemist.

Thio-carbamide, or *Sulph-urea*, $CS<^{NH_2}_{NH_2}$, which may be prepared by heating well-dried sulpho-cyanate of ammonium in a flask in an oil bath for two hours at a temperature of 170° C. (338° F.), forms long silky needles which are very soluble in water. Its reactions with the silver haloids are peculiar, and somewhat resemble those of thio-sinamine.

With silver bromide it sets into a pasty mass, and does not discolour it. Carbonate of soda added liberates ammonia, darkens the bromide, and, from the smell, some sulphide of ammonium seems to be formed. Muriatic acid precipitates chloride with the nitric acid solution. Eikonogen developer blackens the bromide darkened with soda. The black precipitate is only partially soluble in nitric acid, and the clear solution gives chloride with muriatic acid.

With silver chloride it also forms a pasty mass, and there is the same evolution of ammonia and darkening with soda; a metallic deposit of a yellow colour is sometimes deposited on the glass vessel. Weak nitric acid has little action, but strong acid causes brisk effervescence and evolution of nitrous fumes, but does not readily dissolve the precipitate on the glass, nor entirely restore the white colour of the chloride. Muriatic acid added to the nitric acid solution precipitates chloride. Eikonogen developer blackens the darkened deposit at once. Nitric acid causes great effervescence with nitrous fumes, partially restores white chloride; the solution precipitates chloride with muriatic acid.

With silver iodide, thio-carbamide also sets in a pasty mass, which does not darken alone. Carbonate of soda gives off ammonia, but does not darken the iodide so strongly as the bromide and chloride, nor is any mirror formed on the glass. Nitric acid removes the darkened coat, but muriatic acid produces very little chloride with the acid solution.

(*To be continued.*)

THE *Daily Telegraph* publishes the following note with regard to modern street Photograph-Spoilers:—" 'Sky-signs,' as the huge hanging-letter advertisements on the house-tops are called, came before the Paddington Vestry in reference to a structure of this kind on the roof of an hotel in Elgin Avenue, which it was proposed to declare dangerous. Eventually the Vestry contented itself by denouncing the device as 'most objectionable.' The discussion showed that 'would curses kill as doth the mandrake's groan,' these eyesores would not have long life before them. Failing this remedy, it was resolved to petition the London County Council to frame bye-laws to control the raising of such structures. It has been seriously proposed to levy such a tax upon them as would sensibly swell the local revenues."

THE BRITISH ASSOCIATION COMMITTEE ON GEOLOGICAL PHOTOGRAPHS.*

First List of Geological Photographs (to July, 1890).

Note.—This list contains the subjects of all geological photographs known to have been issued. Copies of those *only* to which the *registered No.* is attached have been received by the Secretary of the Committee.

Copies of any photographs desired can, in most cases, be obtained either from the photographer direct—whose address is usually given—or from the officers of the local society under whose auspices the views were taken.

The Committee in no case has assumed the copyright of photographs registered, which is presumed to be held by the photographer.

The price at which the photographs may be obtained depends upon the size of print and local circumstances, over which the Committee has no control.

Cheshire.—Liverpool Geological Society, per W. Hewitt, secretary (photographed by E. Newall, 14, Elm Grove, Tranmere), size 8¼ by 6½ inches:—Registered No., 1, 3, 4, 5, Storeton Quarry, 1887—Various sections; 2, ditto, 1887—"Footprint bed"; 6, Wallasey, 1887—Quarry in Lower Keuper; 7, 8, ditto, Breck Road—Section showing "current bedding"; 9, Prenton Lane, Birkenhead, 1887—Junction of Keuper and Bunter; 10, Bidston Hill, 1887—Fissile Keuper sandstone; 11, Hilbre Island (mouth of River Dee)—Bunter; 12, 13, ditto (Middle Island)—Conglomerate bed; 14, Thurstaston Hill, 1887—"Thor's Stone," an outlier of the Bunter: 15, West Kirby, 1887—Fault at Calday Grange; 16, ditto—Junction of Keuper and Bunter; Flaybrick Hill, 1887—Ditto; ditto, 1885—Fault in Keuper; ditto—*Roche Moutonnée*; Poulton Quarry, Wirral, 1885 (2)—Jointing in Keuper. Per J. Lomas, 23, Avondale Road, Liverpool:—Dawpool, Wirral, 1888 (4)—Boulder clay cliffs on bank of River Dee showing interbedded sands, &c.; Hilbre Island (2)—Coast erosion; Wallasey (2)—Sand dunes, showing stratification; ditto, Breck Road—"Contortions" in Trias; Ince—Peat beds; ditto (Ship Canal sections)—Fault in Trias. Photographed by E. Timmins, Runcorn:—32, Runcorn (lane to Higher Runcorn)—Frodsham beds of Keuper.

Cornwall.—Photographed by Percy F. Kendall, 31, Parkfield Street, Manchester:—Land's End—Columnar jointing; St. Erth—Pliocene clays; ditto—Contorted strata; ditto—Pliocene sand resting on elvan. Per Rev. H. H. Winwood, 11, Cavendish Crescent, Bath:—Registered No., 36, Mitford Tunnel—Mitford sands; 37, Tucking Mill—William Smith's House; 38, ditto—Tablet to the memory of William Smith ("Father of English Geology").

Devonshire.—Photographed by J. J. Cole, Maryland, Sutton, Surrey:—Registered No., 57, Lulworth (Stare Cove)—Showing contorted strata. Per W. Pengelly, Lamorna, Torquay (photographed by William Widger, 44, Union Street, Torquay):—58, Torquay—Entrance to Kent's Cavern; 59, ditto—Entrance to Brixham Cave.

Isle of Man.—Photographed by Ed. Newall, Liverpool Geological Society:—Registered No., 31, Scarlett Point; 30, Port St. Mary—Glaciated limestone surface; and some others not designated. Per Yorkshire Naturalists' Union, Geol. Photo. Section (photographed by S. A. Warburton, 9, Banstead Terrace, Leeds, size 8 by 5 inches):—75, Douglas Head, 1885—Contorted slate. Photographed by J. E. Bedford, 9, Cardigan Road, Leeds, size 8 by 5 inches:—76, Scarlett Stack, 1888—Basaltic boss; 77, ditto—ditto, with dyke; 78, Scarlett Point, 1888—Upheaved limestone; 79, ditto—Weathered volcanic ash.

Kent.—Per Arthur S. Reid, Trinity College, Glenalmond, N.B.—Eltham Valley, 1889 (3)—Sections in Thanet chalk (railway cuttings); Canterbury (1, 2)—Pipe in chalk; ditto (3)—Thanet chalk; ditto (4)—ditto (incipient pipe).

Lancashire.—Photographed by E. Newall (Liverpool Geological Society):—Registered No., 17, 18, Woolton, Liverpool—Two views of the 'Calderstones' (stone circle). Photographed by E. Ward, 219, Oxford Street, Manchester—Series of views of the 'Oxford Road Boulder,' now in the Quadrangle of Owens College, Manchester; ditto Manchester Ship Canal. Photographed by Godfrey Bingley (Leeds Geological Association) for the Yorkshire Naturalists' Union (Geol. Photo. Section). Size 4 by 2¾ inches:—91, 92, Lindale, near Grange, 1889—Old sea cliffs in carboniferous limestone (2); 93, 97, Hampsfell, ditto, (5)—Escarpment in limestone showing weathering; 98, 105, ditto, (8)—Weathered carboniferous limestone; 106, 108, ditto (3)—Limestone boulders lying on carboniferous limestone; 109, 117, ditto (9)—Erratic boulders (various) lying on carboniferous limestone.

Leicestershire.—Leicester Literary and Philosophical Society—per James Plant, West Terrace, Leicester (photographed by John Burton and Sons, Leicester), size 12 by 10 inches:—29, Croft Hill, July, 1881—Syenite, Trias, and Boulder clay; ditto, May, 1882—ditto; Barrow-on-Soar, June, 1881—Arches in Lias limestone; Mount Sorrel, July, 1875—Hornblendic granite; ditto, Sept. 1877—ditto; Humberstone, May, 1881—The 'Holystone' erratic; Broombriggs, Charnwood Forest, July, 1875—Charnwood slate; Benscliff, Charnwood Forest, July, 1875—ditto; 'Hanging Stone,' Charnwood Forest, August, 1881; Woodhouse Eaves, Charnwood Forest, June, 1881; Saffron Lane, Leicester, June, 1882—Boulder clay; Breakneck Hill, Charnwood Forest, June, 1881—Keuper, lying upon Charnwood slate; Ring Pit Quarry, Charnwood Forest, June, 1881—Concentric rings in slate; Swithland, Charnwood Forest, June, 1881—Slate; Stoney Stanton, June, 1881—Southerly extension of Charnwood rocks; 28, Aylestone, 1881—Erratic block of Mount Sorrel granite.

Montgomeryshire.—Caradoc Field Club (photographed by W. W. Watts, Sidney College, Cambridge):—Registered No., 88, Corndon Hill, (S.E.), 1885, (12A)—Dolerite, resting on shales: 89, ditto—Base of Corndon laccolite; 90, ditto, (W. side)—Middle Arenig shales resting comformably on Dolerite.

Nottingham.—Photographed by John Burton and Sons, Leicester:—Nottingham, June, 1882—Church Cemetery, caverns in Pebble Beds; ditto, (2)—Castle Hill, Bunter; Himlack (or Hemlock Stone)—Showing denudation. Per James Shipman, Manning Grove, Nottingham:—Nottingham Castle—Pebble beds; Kimberley—Permian, resting on tilted Coal measures; Hemlock Stone, Nottingham; Nottingham—Faulted Keuper; Blidworth—Outliers of Keuper (supposed "Druidical" remains); Beeston—Interglacial sand and river gravel.

North Wales.—Chester Society of Natural Science, per George Frater, The Bank, Wrexham (photographed by Alfred O. Walker, Nant-y-Glyn, Colwyn Bay), size 6 by 4 inches:—Registered No. 42, Cefn Bueno Caves, Vale of Clwyd; 43, 45, 46, 47, Cefn-y-bedd, Wrexham; 44, Holywell, Bagillt—Lower Coal measures; 48, Colwyn Bay, Pen-y-Bont Farm, 1889—Drift with alternate beds of clay and sand. Leeds Geological Association, per J. E. Bedford, photographed by Godfrey Bingley, 15, Cardigan Road, Leeds, for the Yorkshire Naturalists' Union (Geol. Photo. Section), size various:—118, Llandudno, Great Orme's Head—Erratic boulder; 119, 121, ditto—Weathered blocks of Carboniferous limestone; 122, ditto—Escarpment of Carboniferous limestone; 123, ditto—Section in limestone quarry; 124, 128, ditto—Cliffs showing stratification; 129, 131, ditto—Fissure in limestone; 132, 137, ditto—Views of cliff sections.

(*To be continued.*)

* Continued from page 707.

Bath Photographic Society.—On Monday last the President and several members drove to Claverton for the purpose of photographing in and around the Church and Manor House. Widcombe Old Church was the next scene visited, and here again numerous pictures were secured. At six o'clock the party met at the President's residence, where Mr. and Mrs. Pumphrey entertained the visitors during the remainder of the evening.

Notes.

Photography might rightly be described as the advertiser's friend, so much is it made use of to render trade announcements attractive. One of the most effective methods is that recently adopted by an eminent manufacturer of sewing machines, who publishes an enormous sheet of collotype pictures, taken in different countries, and exhibiting the said machines in use by the inhabitants of far distant regions. Thus we have ——'s machine in India, ——'s machine in Japan, and so on. It is a pity that this bold advertiser cannot make capital out of the present furore which exists for everything pertaining to Darkest Africa, but, unfortunately for him, sewing machines are not used there at present. A picture of one tended by natives dressed in nothing sewable would be supremely ridiculous.

Mr. Spiller's opinion that primuline is likely to prove a formidable rival of the ferro-prussiate process, reminds us that this latter method of printing is not half as common as it ought to be. For the reproduction of engineers' and other plans it is, of course, largely used; but its convenience as a means for securing a rough proof from an ordinary negative does not seem to be fully recognised—at least, we judge so from the difficulty we lately experienced in procuring some from several dealers to whom we applied. The reply was in each case, "We do not stock it," varied by, "We have no demand for it." We feel convinced that, if tourists who venture to develop their plates *en route*, but who never dream of printing until they get home, were fully aware of the convenience of this method, which requires only plain water for development and fixing, this paper would be used a great deal more than it is at present.

There is a particular use for ferro-prussiate paper which we have not yet seen proposed, but which seems to us to suggest itself as one well worth the attention of those who make line drawings for reproduction in block form by photography. An artist who has devoted himself to this class of work would have no difficulty in tracing over the lines of a blue print in black ink, and in expressing the shadows by line-work, or "tints" of different depths. (Probably the paper would require sizing before this could be done satisfactorily, but of this point we have no certain knowledge.) When this drawing was re-photographed so as to obtain a negative, the black lines only would be reproduced, the blue colour being ignored by the sensitive surface. This seems to us to be a far more practical way of obtaining a line copy of a photograph than another which has often been proposed—namely, to trace the lines on an ordinary albumen print, and to render the photograph invisible afterwards by bleaching out with mercury. The ink lines would most surely run during this last operation.

So much ingenuity has been exerted in contriving methods by which plates at the back of a camera can be rapidly changed, that it would seem to be almost an impossibility to devise anything fresh. But we were recently shown a method which appears to us to be not only perfectly novel, but one which fulfils its purpose in a very admirable manner. The plates are held in sheaths, and are stored, faced upwards, in a receptacle above the camera. By the touch of a lever each plate is turned, flaps down, and assumes the vertical position at focussing distance. The sheath in which each plate is held is of special construction, and has a projection at each of the two upper corners, by which it is held during the movement. This clever contrivance is attached to the "Quadraut" detective camera manufactured by Messrs. Humphries, of Islington.

There are more uses for the photographic studio than merely taking photographs. When business is slack, plenty of opportunity presents itself for the photographer to exercise his active brain, and most photographers have active brains. The most successful grower of vegetables under glass is Mr. Bashford, who has establishments in Jersey and Guernsey. Mr. Bashford, a few years ago, was a photographer. In some way he conceived the idea of experimenting on raising vegetables under glass, and built his first greenhouse in 1874. His idea succeeded, and he has since then become a millionaire, and the principal grower for the London market. His houses are of colossal size. The latest addition to his establishment consists of a group of six, each a thousand feet long and thirty feet wide. Some are devoted to grapes, while in others tomatoes are forced, and in a third set potatoes are grown, a crop being obtained at Christmas, and another in April.

The *Moniteur de la Photographie* is politely ironical on the removal of the police restrictions which up to very recently prevented one photographing in the public streets. We in England possibly wonder why such a regulation should ever have been deemed necessary even by the police; but it seems that hitherto, in Paris, a photographic apparatus has been regarded as an obstruction. The *Moniteur* points out that the permission to photograph in the streets has only been given since the hand apparatus has been in almost universal use, and quietly insinuates that if the absurd rule had still been in force, any policeman attempting to carry it out would have found himself reproduced before he could even have thought of speaking about a charge which he could not establish.

Apropos, the constable who has charge of the newly opened Dulwich Park holds views very much in accord with his brethren across the Channel. The other day a well-known local amateur thought he would like to take some views of this, one of the latest lungs of London; but, being a law-abiding citizen, he first of all consulted the official in question. "No," said the latter; "you can't set up your machine here." "Well, but I don't want to set up any machine," said the amateur, showing a hand-camera; "this is my apparatus." The official

stared at the box, thought it looked harmless, and finally graciously accorded his permission. It is said that the amateur, while holding parley with the constable, slily took his photograph, which was afterwards published in a local paper; but this story we cannot verify.

What we should like to know is, has the constable in question any definite orders from the County Council on the subject of photography, and, if so, what are they? Seeing that cyclists are allowed in the public parks, it would seem very absurd if any restrictions were placed upon photographers. We can understand the itinerant variety having to submit to regulations; but surely rules are not necessary for the amateur. Possibly, to a constable, a photographer is a photographer, and nothing more; he knows not distinctions between amateurs and professionals.

It is an undoubted fact that there are few things about which people are so sensitive as their photographs. The amateur photographer may unwittingly get into great trouble through forgetfulness of this susceptibility. We know a case where a lady was properly offended because, by some mishap, a friend happened to see a proof of a photograph which had been taken by an amateur before she did. The reason is not far to seek. Most people have rather a dread of the amateur portrait photographer. They do not know how they may "come out," and if you are to be caricatured you like to see the caricature yourself before anybody else has the chance. There is one very excellent reason for this. You may like to destroy both the proof and the negative. Perhaps if the amateur bears this in mind he will not go far wrong. Therefore always let him show a proof of a portrait to the person concerned before anybody else sets eyes upon it.

A writer in the *Globe* draws a dreadful picture of the lady photographer. According to this authority, she is most exacting and unreasonable, even to the extent of pining for a sun which she can drag about the heavens with a cord and pulley so as to take the pictures she requires at all hours of the day. As for scenery, there is nothing which satisfies her. Her friends exert themselves to find choice "bits" of country, but to no purpose. Caverns are too dark, woodland bits are too scattered to fit on a plate, the church has a spire, and would require an upright plate, whereas the fair photographer has only narrow oblong plates. The lady photographer is also perpetually losing screws or other little impedimenta belonging to her apparatus, and always discovering that she has the wrong lens for some particular picture—a wide-angle when it should be a long-focus, and *vice versa*. Altogether, the article is in so caustic a strain, that we fancy it must have been written by a lady—a supposition which is all the more justified because the article is headed "Fashions and Fancies."

Mr. Frederick Harrison, it is very clear, has not followed the progress of photography in recent years, or we should not have him, in going through the details of his proposed treasure chamber for posterity, saying: "If experts could suggest a mode of protecting photographs from decay, or of transferring a photographic picture to some indestructible substance, it is clear that we might preserve for the twenty-ninth century photographic portraits of our great men, views of our public buildings, of our daily life, of many an historic incident." Mr. Harrison does not know that all this is practicable. Vitrified photographs would, we fancy, stand the test of time better even than the inscriptions on Cleopatra's Needle.

The paragraph that went the round of the press the other day, to the effect that a schoolboy had taken a photograph of his master while in the act of bestowing chastisement on a schoolboy, has obviously suggested the amusing sketch in the *St. James's Gazette*, entitled "Wilkins Caves in." The story is, shortly, this:—A boy breaks his leg, and to console him during his retirement, Mamma makes him a present of a Demon detective camera. Directly he gets the apparatus he conceives the idea of photographing Wilkins, the headmaster, towards whom he owes a grudge. When he recovers he starts upon the work. The first photograph is that of Wilkins sitting in his box, "because up there in his gown, he looks rather like a crow." The second one was secured when he was caning a schoolboy, "because he twists his face when caning." Wilkins was photographed a third time, "when he was looking out of the window, and the sash came down on his neck." These photographs were distributed among the boys, and gazed at with great pleasure. Unhappily, one of the under-masters discovered one of them, and the whole thing came out. Great was the wrath of Wilkins, and the young photographer had to account for all the photographs distributed. All were unearthed and destroyed save one, and this was eventually traced to the under-master who had made the discovery. Despite the indignation of the assistant, he too was secretly delighted at the photograph, and the boys are dying to know what the interview between him and Wilkins was like, and whether Wilkins administered the punishment which they themselves had received. Decidedly it is a risky thing to photograph your school-master.

A writer in the *Sunday Times* who has been surveying the world from China to Peru, as to the outlets for the energy of women in regard to remunerative employment, puts photography in the list. He is, however, rather guarded in his statement, observing that though there are one or two ladies in the provinces who are professionally successful, in London the sex has not yet come into anything approaching appreciable rivalry with men. To establish oneself successfully as a photographer now-a-days demands a large amount of energy, patience, and, above all, capital. The money necessary to equip a photographic establishment a lady could utilise much better elsewhere.

THE DAGUERRE CONVENTION IN AMERICA.

THE eleventh annual Convention of the Photograghers' Association of America is now a thing of the past, and everyone connected with it may be congratulated on the grand success of the whole affair.

The event that took the Association to the City of Washington was undoubtedly the unveiling of the monument to Daguerre, and we are glad to say that this beautiful tribute to the memory of the father of photography is now safely placed in charge of the United States Government, an accomplished fact.

There is no doubt that many members of the Association were afraid to venture to Washington on account of the great heat of the city at this time of year. But those who took the chances were delightfully surprised, and enjoyed some of the most agreeable weather ever experienced at any convention. Instead of the torrid heat usually found in the capital city at this time of year, the temperature was quite moderate, and except in the middle of the day was usually pleasant. Washington, with its beautiful parks and avenues of trees, had on a wonderfully refreshing dress of verdure seldom seen at this time of year; and all who were present at the Convention will remember its delights for many years to come.

The success of the meeting was due to these happy circumstances and the judicious management of the executive officers. Through the kindness of the United States officials, the sessions were held in the National Museum, which was kindly given up to the Association free of charge. We owe this to our good friend, Professor Smillie, the photographer of the department, and also to those associated with him. The Association cannot too heartily thank this gentleman for his untiring efforts for their comfort and the success of the whole Convention. The place of meeting was singularly appropriate, in spite of the crowded condition of the manufacturers' and art departments.

There is no doubt that many more photographers would have been present if it could have been foretold that we should have such delightful weather; and in spite of all the doubts in this direction nearly four hundred members were in attendance. Another element of success was the very able management of the executive officers in providing such an excellent programme, and in carrying it out. There has never been a Convention of the Association where everything worked so smoothly, and so much valuable instruction has been given to the members, as has been accomplished at Washington. There was an unusually large number of papers presented, and the discussions were entered into by the members in the most hearty and satisfactory manner.

The most important event was the unveiling of the Daguerre monument, and all members were very anxious to know how the committee who had it in charge had accomplished its task. It is only twelve months ago that the Association decided to erect this monument, and much cold water was thrown upon the project, owing to some severe criticism of the early design made public by the committeee. As a consequence, subscriptions came in very slowly, and on arriving at Washington the committee could only report the receipt of twelve hundred dollars. Since the monument was to cost six thousand dollars, there was much anxiety as to the action of the Convention. But thanks to the rallying speeches of Mr. Frank Pickerell and others, the good name of the Association was not allowed to be draggled in the mire. The Association was reminded that the honour of raising the monument was theirs, that their officers had obeyed orders, and had accomplished their task to the best of their judgment. It was undoubtedly the duty of every member to sustain the officers, and we are glad to have to record the fact that it has been done nobly. Never in the history of the Association has there been such a hearty support of the officers in their efforts to carry out the wishes of the members. When Mr. McMichael had made his report in a calm and business-like manner, stating simply what had been done, and appealed to the Association for judgment, there was a ripple of dissent for a moment, but the veteran voice of Mr. Pickerell called the members to their duty, and every one felt it was a time for action. Mr. Cramer, of St. Louis, pledged five hundred dollars, and then Mr. McMichael announced that Messrs. E. and H. T. Anthony and Co. would do likewise. This was a good start, and in less than one hour after the report the members had swelled the amount to two thousand dollars. After this subscriptions came in continuously, making it evident that the monument would be paid for by the photographers of America, and that speedily. There is still room for subscriptions, and every photographer in the country should be proud to have his name upon the list of those who honour the father of our art.

To those who did not like the designs that have been published, we would say that these were totally inadequate to express the beauty of the finished work. Those who saw the statue unveiled were very happily surprised, and joined in the general admiration of the finished work. We will not attempt to describe the beauty of this unique work of art, but would advise all to see the pictures of the completed monument that will soon be made. We can only say it is beautiful, unique, a credit to Scott Hartley, who designed it, and worthy of the admiration of every photographer in America. To those who have not yet subscribed we would say, send your subscriptions to Mr. McMichael, Main Street, Buffalo, or to us, and the day will come when you will be proud of having an interest in this tribute to Daguerre, even if it be but one dollar.

Our amateur friends must not forget that they also may share in the honour of raising this monument. Let the various amateur clubs send subscriptions to this noble work for the sake of the art that to them is a "joy for ever."

There is no doubt that these conventions are raising the standard of photography in the United States. Each year the work becomes more beautiful through the influence of the members of the Photographers' Associations scattered through this country. If more of the fraternity would only come into the ranks, and learn what can be done by united effort, they would soon find a better way to gain a larger remuneration for their work, better homes, and greater happiness for those that are near and dear to them. There has never before been such an exhibition of the strength of this Association as was seen at the Washington Convention, and all who wish to enjoy this strength and increase it should enter the ranks and grow with it.—*Anthony's Photographic Bulletin.*

THE Chemical Committee of the New York Society of Amateur Photographers some time since invited all the manufacturers of dry plates to send in plates for testing. This Committee has now issued its report, giving the sensitometer number, and the relative speed of each.

THE PRESENT STATE OF THE CARBON PROCESS.*

BY W. E. DEBENHAM.

When the process of printing that depends upon the locking up of pigment in gelatine rendered insoluble by exposure to light, and that is generally known as the carbon process, was popularised, to a certain extent, by the improvements of Swan and of Johnson, great hopes were expressed that a process capable of yielding results good in themselves, and—what rendered it essentially desirable—results that are permanent, would become generally adopted, at all events, for any work but that in which permanency was not much considered. Its use was, however, for a long time almost entirely limited to the reproduction of artistic and archæological designs, and to the purpose of producing such photographs as, being out of the convenient way of production by ordinary private photographic establishments, were naturally put out by them to houses who made a speciality of doing work for the profession. I refer particularly to enlargements, for which its use was pre-eminently selected. It was felt by photographers who desired to do justice to their customers that, where considerable sums were received for single pictures, on account very much of the artistic labour bestowed upon them, it was not fair to issue them on a basis liable to fade, and render the work worthless.

For a long time, however, although there was a great increase in the amount of work done, there was nothing to indicate the likelihood of any general adoption of carbon printing, but about fourteen or fifteen years ago this consummation seemed more likely to come about, owing to the introduction of the process of double transfer from a glazed surface. Many photographers went in for this process, some even exclusively, for their ordinary portrait work. Of these latter I don't know of any who have kept to the path which they entered upon with so much hope and confidence. What is the reason? Or, perhaps more properly, what are the reasons? For one thing, it may be said that the process was more expensive and troublesome than silver printing, and that the public did not care enough about permanency to pay an extra charge for that quality. Others may say that platinum printing has come to the front, and that they prefer the results of the latter process. We are not discussing platinum printing to-night, but I think it may be argued that, with both processes at their best, the carbon process will better register the gradations in the more transparent portions of the negative, and consequently will be freer from heaviness, and want of luminosity of the shadows, than platinum prints on a matt surface.

I think some real reasons for the decline of carbon printing amongst photographers and amateurs are to be found in certain defects to which prints by this process are frequently liable. The two failures most common in private hands are, perhaps, first, a want of richness and vigour in the blacks, unless negatives of extra density are used; and secondly, a liability to washing bare in the lighter half-tones, by which the delicacy of gradation at the end of the scale is lost. A third common fault is a want of purity of the high lights. If these defects were necessarily inherent in the process, it might not be worth while to say much about them; but such excellent results have been seen, and are so commonly produced by the houses who work for photographers, and who make a speciality of enlargements, that it may be supposed that the failings mentioned are due rather to a want of general knowledge of the means of guarding against them, than to a radical defect in the process itself. Perhaps the forthcoming discussion may do something towards making the way clearer.

* Read in opening the discussion at a meeting of the London and Provincial Photographic Association.

THE GENEVA PHOTOGRAPHIC EXHIBITION AND SOCIETY.

The photographic exhibitions connected with the Photographic Society of Geneva take place once in two years, and the third of them was opened last Monday in the Batiment Electoral, a handsome stone building in the best part of the city.

The best photographs on view at the Exhibition are artistic portraits by A. Ruffo, Prince de la Scaletta, of Rome; they are of rather larger than whole-plate size, and are printed in carbon direct from the original negatives; the head and shoulders are included in each picture. They are exceedingly fine specimens of the powers of the carbon process in the hands of a real artist. Words can no more describe pictures than scenery to those who have not seen them, and it would be interesting if, at some future time, these portraits could be placed on public view in England.

Amongst other first-class exhibits are some platinotype portraits by Jean Lacroix, of Geneva; they are of a high order of merit, rich in the most delicate half-tones and in artistic posing of the sitters. One of the small ones, representing a little girl in a fur cape, is among the best.

A fine piece of work, which attracts general attention, is Eccogia, representing wood and water scenery; the picture measures about 16 by 20 inches, and was printed from the original negative of the same size, so that a large camera had been employed. This is one of the numerous photographs placed on view by Frederick Boissonas, of Geneva; an orthochromatic plate had been used, and the print is upon albumen.

Also among the superior pictures in the Exhibition are carbon prints and enlargements, of all classes of subjects, by Mr. Pricam, of Geneva. His policy is that of Messrs. Gernzet Bros., of Brussels, to turn out none but permanent prints, so that after the lapse of years his prints will be found in good condition in albums, alongside old prints taken by others upon albumenised paper, which have changed to the colour of pea soup. In some of the lake and river scenes little touches of high light come out in the right place, and in strong contrast to the rest of the picture. He says that these have not been put in artificially, but are in the original negatives.

Madame A. de Rothschild, of Pregny, near Geneva: the landscapes are good, but without clouds, and some difficult interiors have been well rendered for an amateur. A defect in a considerable proportion of the landscapes in the Exhibition is the absence of clouds. Mr. and Mrs. Houston Chamberlain, of Vienna, are among those who have sent in some excellent work in clouds, and numerous good platinotype prints.

Adrien Peyrot exhibits good specimens of instantaneous work, including various pictures of mountain goats; one of these pictures is printed as an enlargement upon Eastman's bromide paper. A French camera called the "Kinegraphe" was used to take the negatives.

Mr. and Mrs. Alois Minutti, of Chaux de Fonds, exhibit good work, especially in one picture representing trees and

clouds, somewhat in Mr. Gale's style. Clouds are too much absent in their landscapes.

Mr. E. Sautter, an able amateur of Geneva, has succeeded in producing excellent group and other photographs by the magnesium light, some of them as good as if taken by daylight in the studio.

One of the most curious pictures in the Exhibition is a view of a bridge across the Rhone, and the moon, taken by moonlight. Some detail comes out in the distant mountains, and the gaslights on the bridge are well represented. Jupiter was in the field of view, and through moving during the exposure, is represented as a short streak in the sky; the motion of the moon also caused that orb to appear in the sky like a cylinder with rounded ends. This view was taken one night in July last.

Dr. Lindt, of Aarau, has taken up an unusual and difficult class of work, namely, that of photographing stained glass windows, and has succeeded in well representing the windows in the convent of Muri, of the sixteenth century. He uses orthochromatic plates. He has also well represented some ecclesiastical relievos; the originals were in dark wood.

F. E. Thévoz and Co., of Geneva, exhibit specimens of photomechanical work, and as a young firm, has made good progress in a short time. Among their prints are some closely imitating photographs on albumenised paper. Specimens of their work are to be found in the *Revue Suisse de la Photographie*.

To notice the work of all the numerous exhibitors is not possible with the space at command, and in some cases might not be pleasing to those criticised.

Lacombe and Son, of Geneva, exhibit photo-crayon pictures resembling good pencil drawings. A. Moynier, interiors, lake views, and portraits. Maurice Trembley, lake and mountain views. Mr. Müssbaumer, of Zurich, landscapes. Madame Paul Godet, of Neufchatel, engraving-like interiors on bromide paper. E. Fatio, mountain views in the Valais. E. Muller, of Aarau, mountain views. C. Criesis, some good instantaneous street and other views; in one of them he has caught a goose in the act of flapping its wings, and with good effect. Madame Elisée Reclus, of Clarens, views, including one of a lake-boat steaming past the camera, broadside on. Ed. du Bois, of Fleurier, excellent lantern slides of Swiss scenery. G. Pictet, yachts and landscapes.

In apparatus, Rauser and Co., of Geneva, exhibit cameras and stands of their own make. Messrs. Fabre and Borrey, general photographic goods, including developing dishes of enamelled iron, and an excellent lens-shutter by Steinheil. Boxes of dry plates by several English, Swiss, and French makers are on view. Mr. Goegg, of Geneva, exhibits photographic chemicals.

The Photographic Society of Geneva was founded in 1881, and its first president was Mr. Hermann Fol, professor of biology at the University, and who recently raised the question for photographic solution about the growth of resemblances between married couples. The present president is Mr. H. C. Nerdinger, to whose kindness in offering information, also to that of Mr. Pricam, we are much indebted.

Mr. Pricam was Secretary to the Photographic Jury of the late French Exhibition in Paris. He is President of the Jury of the present Exhibition in Geneva; the other members are Messrs. Fatio, Sarassin, Demole, all of Geneva; Mr. Welti, of Lausanne; Mr. Chable, of Neufchatel, and Mr. Barbieri, Professor of Photography at the Polytechnic School at Zurich.

Mr. Braun, of Dornach, produced a composite photograph, in which the Paris Exhibition jury is represented as the "Archers of St. George" dining together. The picture professes to be a copy of an old painting in the Municipal Museum at Harlem. In it Mr. William England is represented as a Dutch lieutenant-colonel, with a great ruff round his neck; the other members "taken off" are Messrs. Darlot, Pricam, Vidal, Davanne, Van Braam, Gaston Braun, Levy, Bilbaut, Audra, and C. S. Hastings. One copy of this remarkable picture was printed for each member of the jury, but no more prints were struck off.

Mr. Pricam is president of the Swiss Photographic Society, an organisation which meets once a year, and deals with commercial questions; its meeting next year will be in Lucerne. A burning question is the pirating of Swiss photographs; sometimes negatives are obtained at great cost and at high altitudes, but after the prints get into circulation foreign firms reproduce them as collotypes, and sell them at one-fourth the price charged by the owners of the negatives.

PHOTOGRAPHY IN GERMANY.

BY DR. H. W. VOGEL.

COLLODION *versus* GELATINE—GAEDICKE'S NEW INVENTION—GAEDICKE'S EXPERIMENTS WITH DEVELOPERS—PHOTOGRAPHIC TESTS OF RED GLASS FOR THE DARK ROOM—EFFECTS OF PAPER WRAPPERS ON THE KEEPING QUALITIES OF DRY PLATES.

SINCE the introduction of the gelatine process pains have been taken by many to improve the old collodion process to such an extent that it unites the facility and rapidity of development, fixing, and washing with the sensitiveness of the gelatine plate. The first attempt of this kind was probably my gelatine collodion. I dissolved dry gelatine emulsion in glacial acetic acid and mixed the same with methyl collodion. In this way an emulsion was formed which flowed in a warm state upon the plate; like collodion, was dry within an hour; and developed, fixed, and washed as quick as collodion plates. The film resisted even boiling water. The process has been applied more or less since 1883, but it lacked durability, because the gelatine decomposed from the collodion with formation of acetic ether. Several scientists experimented later on in a different way, but so far without success. It seems now that Gaedicke, the inventor of the flash-light, has at last succeeded. He makes the following communication. About the durability of the plates I have an experience of six months, during which time they have not decomposed, and there is no reason to doubt their durability any longer. The observation had been made that the old, the not very sensitive collodion dry plates produced with preservatives, had to be developed quickly after exposure, as otherwise the picture would disappear again. To test now my new plates with regard to this property, five small sensitomer plates were cut from a plate and exposed uniformly to gaslight. One of them was developed at once; the others were kept in the dark and developed at different periods. The first plate gave the number 16; the second was developed after two days, the third after eleven days, and the fourth after six weeks, and all gave uniformly the number 16. The fifth plate is still kept in the dark, and will be developed at some later time. As a preliminary, it is therefore confirmed that the impression of the image will remain unchanged for six weeks. The sensitiveness of my collodion dry plates resembles that of a gelatine plate of medium

rapidity, but remains behind the highly sensitive gelatine plates. Of course they are only produced colour-sensitive. The film is very thin and rich in silver, and in a dry condition easily injured, requiring great care in handling the same. After fixing in a wet condition the film is so tough that it can be rubbed with the fingers. Regarding the treatment, a considerable over-exposure will not do the least harm, having in the development the means to retard the same. After exposure, the plate is flowed with water and left to soak for fully a minute, because too rapid a development would produce fog. After the water has been poured off, the soaked plate is flowed with the developer. The most suitable is an old hydroquinone developer, to which has been added a small quantity (about $\frac{1}{10}$) of fresh developer. The picture appears in six to twenty seconds, according to time of exposure, and the development is completed in one to two minutes. The plate is now rinsed well and placed under the faucet for about five minutes, or in a dish with water, which is renewed several times. After this it is free from soda, and has lost also its pink colour. In a short time it can now be dried in the open air or with artificial heat.

Talking about Mr. Gaedicke, I will also mention his experiments with different developers on under, over, and correctly-exposed plates. He has compiled his results in the following table :—

A. Under-exposed Plates.—Exposure, 1 second. Gaslight at 72 c.m. distance from the flame—that is, one-fifth of the normal exposure.

No.	Kind of Development.	The Picture appears in	Time of Development.	Last Readable Number.	Character of the Picture, with Remarks.
1	Oxalate of iron, with addition	9 sec.	5 min.	14	Yellow fog, 1 and 2 show very little difference.
2	Pyro-potash	12 ,,	3 ,,	14	Red fog
3	Hydroquinone, with potash	20 ,,	3 ,,	15	Clear.
4	Eikonogen—potash, with preliminary bath	6 ,,	3 ,,	14	Yellow fog.

B. Fully Exposed Plates.—Exposure, 1 second. Gaslight at 32 c.m. distance from the flame.

5	Oxalate of iron, pure	12 sec.	3 min.	16	The negatives were all good and harmonious. By transmitted light the pyro negative was brown-black, the others blue-black, therefore better adapted for printing. The least clear was the picture made with iron developer.
6	Pyro-potash	8 ,,	$2\frac{3}{4}$,,	16	
7	Hydroquinone	25 ,,	$3\frac{1}{2}$,,	16	
8	Eikonogen—soda	12 ,,	3 ,,	16	

C. Over-exposed Plates.—Exposure, 4 seconds. Gaslight at 32 c.m. distance from the flame—that is, four times the normal exposure.

9	Oxalate of iron, with 4 drops bromide of potassium (1 : 10)	18 sec.	$3\frac{1}{2}$ min.	16	1 to 8 little gradation, weak, and not fit for use.
10	Pyro-potash, with 8 drops of bromide of potassium	20 ,,	$2\frac{1}{2}$,,	16	Better gradations than No. 9. Somewhat too hard, but still fit for use.
11	Hydroquinone, only old developer, with 8 drops of brom. of potassium	60 ,,	5 ,,	16	Normal negative the best of this group.
12	Eikonogen—soda, with 8 drops of bromide of potassium	30 ,,	$3\frac{1}{2}$,,	16	Weak and unfit for use.

The exposure was in gaslight, behind a sensitometer scale. Gaedicke says: "At quite a normal exposure good negatives can be obtained with all developers. But the hydroquinone developer is considered as the most convenient, most durable, and cheapest. It can be bought concentrated ready for use at a very low price; no measurements are required; no part is missing at a critical moment, and the dilution of a new bottle of the developer takes not more than two minutes. As generally two-thirds of old and only one-third of new developer are used, the hydroquinone developer is therefore the cheapest. For greatly over-exposed plates, as is oftentimes the case in landscape photography, pyro and hydroquinone are applicable, but hydroquinone is to be preferred. It is also oftentimes the case that negatives are to be developed of which the time of exposure is unknown, and the safest developer for this is hydroquinone, two trays being used with equal quantities of developer, the one being old, the other new developer. The plate is first flowed with the old developer, and then with the new. If no picture appears after the first minute, new developer should be carefully added, and a good result will be certain. But the hydroquinone developer has one dark side: it develops only with difficulty in cold weather, and the developing room should therefore have always a moderate temperature.

In my last letter I wrote to you about red glass for the dark room lamp. The result of this publication was that quite a number of red glasses were sent to me for examination; but almost all of them were useless. Complaints have also been made that I proposed a spectroscopic test instead of a photographic one, which could be made by everybody. But the thing is, after all, not so simple as we imagine, because the photographic test deceives much easier than the spectroscopic test, and there is considerably more danger to reject actually good glasses, as the following test will show. A red dark room light, pronounced good spectroscopically, was applied in front of a gas flame. The gaslight used varied, on Bunsen's photometer, between seven and eight candles. To test the good quality of the light, the most different kinds of plates, among them a number of scientific spectral views, were developed without fault, during four weeks, in the ordinary way, the tray being kept in the shade during development, and only from time to time they were examined for a few seconds in the light of the red lamp. After the plate had come to an advanced state of development, it was examined at about 20 c.m. distance from the gaslight for some seconds. The yellow side light of the lamp, which admitted the passage of remarkably blue light, remained open without the rays of the same touching the plate directly. The usefulness of the red light having been

determiued iu this manner, even for eosidc of silver and azalin plates (with the latter I kept the developing tray covered), the photographic test took place. 1. A Sachs plate was exposed for sixty seconds under a reproduction negative with very transparent clear parts at a distance of 18 c.m. from the gas light (by inserting the red light), and was theu developed with fresh hydroquinone developer without bromide of potassium. Result: weak but very distinct copy of the transparent parts of the negative after long development. After this result many would undoubtedly have discarded the red glass as useless. 2. The same experiment was repeated at 36 c.m. distance in the same manner. At this double distance the light was therefore four times weaker. The plate was then developed for a long time (until the beginning of fog). Result: very weak picture of the lightest parts of the negative. 3. The same experimeut (2) was repeated in thirty seconds' time of exposure. After long development the faint outlines of a picture were now only visible. Nine years ago, Abney made the observation that light having passed through the red glass is by uo meaus without effect upon ordinary plates, and he recommeuded at that time an addition of iodide of silver to the bromide of silver emulsion, to make it less sensitive to red light. If, therefore, such a dark room lantern is to be tested, it should be determined if it admits the readiug of common-size type at one foot distance; further, whether it will make only a faint light impression, or none at all, at a foot distance in thirty seconds. I remark here particularly that I uever advise daylight, but only gaslight, for the dark room.

I have writteu to you repeatedly about the great damage caused by bad paper wrappers used for packing dry plates, but my advice seems to have been unheeded so far. Recently I opened a package of dry plates of a well-known Berlin firm, three months old, and fouud that the plates had a black border of a third of an inch. That fog on the edges will form even without wrappers has been shown by Wilde; that it will occur easier with ammonia emulsiou has been observed by Armstrong; that the atmosphere, or, better expressed, evaporations, play a rôle has eouvincingly been demonstrated by E. Vogel, by showing that impure wrapping paper acts even through pure paper in which the plates were packed. Lately it has been particularly proveu that plates will fog very quickly on the edges in an ordinary pasteboard box, but that it will be much slower iu a box soaked with paraffin. Gebhardt observed that highly seusitive plates are more rapidly subject to fog on the edges (after four mouths 3 to 5 m.m. wide) thau less sensitive plates. Plates made in winter are more durable than those made during the summer. Different kinds of wrapping paper showed no difference. Gebhardt examined also the layers between the plates. Black soft and gray wrapping paper gave a strong fog after three weeks; while filter paper, tinfoil, aud yellow tissue paper had very little effect. Gebhardt's idea, that only the atmosphere, and not the wrapping papers, is the cause of decomposition, is therefore erroneous. Many wrapping papers act upon the atmosphere by evaporation. —*Anthony's Bulletin.*

A GENTLEMAN has been kind enough to send us a photograph of the back of a postcard upon which is written the word Prizes" 10,858 times. We have not read it through, but it appears to be very interesting.

THE CARTE-DE-VISITE.*

BY JAMES MEW.

THE author of the Essay on Man might, had he lived in the present age, have his portraits hung in the shop wiudows of our principal thoroughfares like ropes of onions. For cartes-de-visite are geuerally disposed in vertical or horizoutal lines, though the stationers and keepers of shops of fancy goods might well take a hint from the sausage merchants, and arrange in graceful festoons the many photographs of the favourites of the hour, hanging them in catenary curves of varied span across their shop fronts to feed the ever curious public eyes.

But what a lesson for the studeut of human nature, what a wealth of speculative content for the moral philosopher, is afforded by the carte-de-visite! The transitory nature of all human grandeur, the evanescent character of the highest fame, cannot be more clearly shown than in the shop window of a modern stationer. Where, in a few months—nay, in a few weeks—will be the favourite cartes-de-visite which, a little while ago, were thick as buttercups in the country fields in the month of May; the "snre cards" representing the different appearances and attitudes at different times and in different places of Lady Dunlo and Mr. Stanley?

Already their autumu has arrived, and their winter is close at hand. Who shall say what will become in that drear season of these faded pictorial leaves? To wrap up butter they are all too stiff, and a man—even the least sentimental of men—would think twice before consigning so much beauty and bravery to the dust-bin. No; there is another use for these. Let a few, only a few, years pass by, and their names will be surely forgotten; and theu, as a faded Colenso has done duty for a foreign cabinet minister, aud an ancient Tom Sayers for a modern Putney Pet, they will be sold in some sleepy old country hamlet for the adornment of humble homes, in which the children will learn to look on them as the exact pictures of the excelleut Miss Nightingale and of the venerable Mr. Spurgeon; or, perchance, in the flux of time, to prize and honour them as ancestral family portraits of their own.

It has been whispered that cartes-de-visite have thus done double duty. Truly, such things are. They form part of the mysteries of the trade, aud recall the practice of those old booksellers who sowed wood-cuts at random in their letter-press with such sublime indifference to any care of connection or relationship, that a picture originally intended for "Who Killed Cock Robiu?" adorned the moving history of the "Babes in the Wood"; aud the poetic legend of "Tom Thumb" presented amidst its pages, to the readers' astounded eyes, a full-length portrait of the pagan giant iu Bunyan's "Pilgrim's Progress."

Another fruit, as Bacon would call it, of the carte-de-visite is the cure of that enthusiasm or hero worship which is so great a factor in the sum of public sentiment. Nay, more than this, the opposite extreme of passion is sometimes engendered by this photographic picture. Mr. Jones, who, in his mind's eye, had looked upon, let us say, the Empress of all the Russians as a person not of human flesh and blood subsisting, but as a sort of demi-goddess nourished on nectar, and far too good for nature's daily food, finds familiarity breeding something dangerously near to contempt when he sees a carte of that distinguished lady differing in no material respect from the portrait of his rich aunt, the butterman's widow, which

* Continued from page 686.

occupies a prominent position above the beautifully bound Bible in his family parlour.

Cartes-de-visite, or card portraits, or C.D.V., as they have, by a species of trade gematria, been succinctly called, have been the occasion—as what indeed has not?—of imposition and of crime. Some years ago a man was convicted of obtaining money under false pretences. He advertised in a daily paper, "Two-and-sixpence per hour easily earned by beginners (either sex) by preparing cartes-de-visite at their own homes. Employment permanent. Trial paper and instructions, 1s. Jones Brothers, Birmingham." It is the kind of advertisement with which we are most of us only too well acquainted. The same sort of thing meets us every day in almost every paper. The admission of "either sex," the easy labour, the advantage of that labour at "their own homes," and the "permanent employment," still bring many shillings into the pockets of advertisers at the present time, as they brought them into the pockets of Jones Brothers until Jones was taken red-handed, and rendered impotent awhile for the public weal.

On another occasion, the cartes-de-visite of a large family were industriously circulated among the richer section of the London population, with a modest request to pay for the board and education of any one or more of that numerous family, whom the benevolent or charitably disposed person receiving their photographs might select. The children were "British-born Protestants," their father an "elderly gentleman ruined by competition in business," their mother in a very "precarious state of health." This bold application may have been the mere outcome of genuine distress, but the "British-born Protestants," the "gentleman ruined by competition," and, above all, the "precarious state of health," bear a stamp very closely resembling that of the begging letter impostor who has given, and will, doubtless, continue to give, so much trouble to the executive of our constabulary.

On cartes-de-visite the celebrated astrologer, Mr. Smith, flourished for a considerable time, like the green bay tree. This worthy gentleman used to advertise his ability to describe the outward shape or form of "your future husband or wife." His knowledge, however, was not sufficient to enable him to divine which of the two was wanted by his customers; he therefore added to his advertisement, "State age and sex." Nor was this reader of stars, this extraordinary being to whom future events were seen clearly as the letters in a child's copy-book, above the consideration of the value of postage stamps. "Send stamped directed envelope," follows immediately on "State age and sex." "For sixteen stamps the true carte-de-visite of your intended, with name, age, and date of marriage." What more could widower or bachelor, maid or widow desire? Moreover, this Mr. Smith, this celebrated astrologer, with a strange thirst for postage stamps, which might denounce him as an impostor in the eyes of those who are unaccustomed to gaze upon the modesty of true wisdom, would, for thirty more stamps, answer three questions. "Three questions," says the advertisement, "answered for two-and-sixpence." Only ten stamps for a question in a field of infinite area. What shall I have for dinner to-morrow? What is the modulus of Brigg's system? Where is the burial-place of Moses? On the whole, it would be a cheap half-a-crown's worth.

Finally, the carte-de-visite is the money-making portion of the photographic profession. It is, in artistic slang, the pot-boiler. It is the necessary staple in the market of photography, and is, consequently, the variety most commonly produced of the photographic picture. When old Kircher—in his prophetic vision of what the camera might give birth to, the sun pictures of the days to come—saw temples and palaces, streets and houses, triumphal arches and lofty columns, obelisks and pyramids, sunrise and sunset, the falling star and the descending angel, nay, he adds in his inspiration all the actions of the universe, flaming thunderbolts, coruscating planets, moving animals, flying birds, the customs of cities and the manners of men, he strangely omits these pictures of their faces and forms, which are dearer to most of us, and far more important in our own estimation than any resemblance of star or sunset, of triumphal arch, or descending angel.

It is the *personnel* of our dearly cherished individuality which the public hankers after, and can comprehend better than any history of learned speech or famous deed, the picture which needs no longer the professional skill and the highly paid service of the miniaturist or painter in oils or water colours, the little fox among the animals of larger growth, the small change in the domain of art, the democracy of portraiture—in a word, the carte-de-visite.

COLLOTYPE PLATE-MAKING.*

I DO not wish to trespass on your valuable time with a long paper, but to give plain instructions and formulæ, and show results, so that any of you interested in photo-mechanical printing can go home and try it for yourselves without being confused with unnecessary matter. The first thing is some good plate glass ground with emery, such as the piece here shown. It is very simple. I take two pieces and put a little emery moistened with water between them, and rub them round and round till I get as fine a grain as possible, and then well wash and clean with spirits and ammonia, when they are ready for the first coating, which is made as follows:—

Four ale or porter	...	...	...	30 ounces
Silicate of soda	...	...	...	3 ,,

This is carefully filtered, and a little poured on the plate, and spread over with the palm of the hand; then put in a rack or stand on blotting-paper to drain; no heat is necessary. They ought to be done over night ready for next day, when, after a good washing under the tap, at the same time rubbing with a soft sponge, and again dried, they are ready for the second coating, which I make as follows —

Coignet's gelatine ...	...	...	...	5 ounces
Nelson's sheet gelatine	...	...	...	2 ,,

Soak in 80 ounces of water, then dissolve, and add bichromate of ammonia 2 ounces dissolved in 10 ounces of water, to which has been added ½ ounce of liquid ammonia. The plates which have been previously described are carefully levelled in the drying oven, and the temperature raised to about 100°, when they are carefully coated with the second preparation just described, and dried at a temperature of 150°, when the gas or hot water is turned off, and they are allowed to cool gradually. They ought not to be used till next day, and they will keep good for about one week; after that time they become insoluble. The next operation is to expose under a reversed negative, either wet or dry plates; but I have never seen a dry plate negative yet that can compare with a wet collodion one, although I have had nearly twenty-five years' experience. The exposure to light is difficult to describe; the best way is to use an actinometer, and give about the same time as you would for a silver print from the same negative; but a few trials will be of more service than a book full of instructions. After the plate is exposed sufficiently, take off the backing, and expose the back to light for five or ten minutes, according to the subject; this helps to bind the film to the

* Read before the North Middlesex Photographic Club.

glass, and prevents too much relief. The plate is now put into water, and allowed to soak till all the unaltered bichromate is washed out ; then give a good rinse under the tap, well clean the back, and put away to dry spontaneously. They should not be used at once, but allowed to get thoroughly hard. The plate, after being put under the tap and dried with a cloth, is soaked with a mixture of glycerine 40 ounces, saltpetre 2 ounces, ammonia 7 ounces, for about five minutes, and dried again with a cloth, and is then ready for the printing, which can either be done in a hand press, or by steam. The ink is very much like litho, and the machine the same.

I don't pretend to anything new, but I have tried to show how collotype is worked, and the foregoing is exactly how it is worked every day by one of the largest firms in the world.

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

An important result of this series of experiments is that the density reached is dependent upon the time of development as well as upon the exposure of the plate. The time it takes to reach a given density varies much with the gelatine employed in making the emulsion and the age of the plate. But with each plate it obeys a certain law, which is more or less clearly visible in every one of the five experiments. The density grows rapidly at first, its growth becoming slower as time advances, and finally tends to a limit. Each experiment is, taken by itself, liable to many errors; but by reducing every experiment to the densities obtained in No. IV., in simple proportion, the following tabulated series of numbers is obtained. The columns marked I., II., &c., are the reduced densities of the corresponding columns of experiment 12. The column marked "Mean" shows the arithmetical mean for any period of development obtained from the five series. The column "Calculated" is obtained by means of a formula based upon the idea that the number of particles of bromide of silver affected by the light is greatest in the front layer of the film, and decreases in geometrical progression as each succeeding layer of the film is reached, an idea which will be better appreciated when we have explained the action of the light upon the film. This idea, expressed algebraically, leads to the formula—

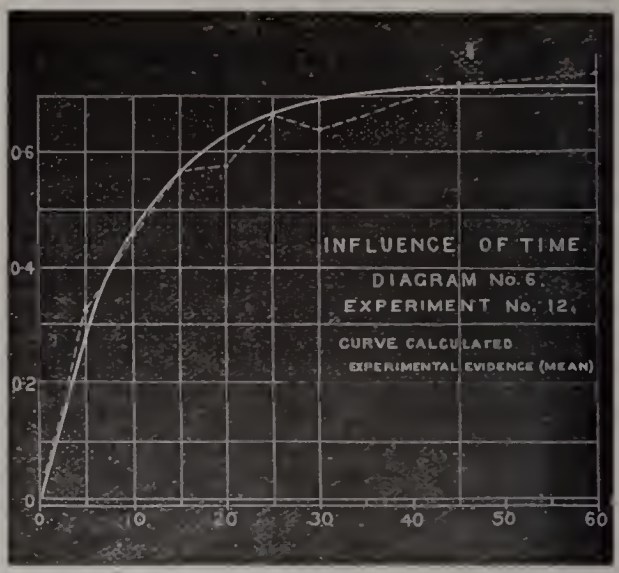
$$D_t = D\,(1 - a^t)$$

where D_t is the density after t minutes development, D the limit of density reached by very prolonged development, and t the time of development; a is a fraction depending upon the nature of the film, concentration of developer, temperature, &c. The constants for the series of figures below are $D = 0{\cdot}720$, $a = 0{\cdot}9015$.

Time.	Recalculated.—Densities.						
	I.	II.	III.	IV.	V.	Mean.	Calculated.
Min.							
5	·349	·350	...	...	·298	·332	·290
10	·502	·460	...	...	·423	·462	·464
15	·588	·550	·569	·570	·569	·569	·568
20	·588	·575	...	...	·583	·582	·628
25	·670	·650	...	...	...	·660	·665
30	·670	·660	·615	·670	·625	·645	·687
45	...	...	·715	·715	·715	·715	·713
60	...	...	...	·740	...	·740	·719

* Continued from page 718.

The relation of the calculated figures to the experimental data is best seen in diagram.



A very important conclusion can be shown to proceed from the formula representing the course of development.

If on any one plate two exposures are given, one of which would ultimately yield density D_1 and the other D_2, and if this plate were developed for a time t, then two densities, d_1 and d_2, would result such that :—

$$d_1 = D_1\,(1 - a^t)$$
$$d_2 = D_2\,(1 - a^t)$$

and it will be seen that on dividing these equations,

$$\frac{d_1}{d_2} = \frac{D_1}{D_2}$$

the resulting ratio is independent of the time of development, and is equal to the ratio of the ultimate densities which would be reached, so that the gradation of negatives appears to be independent of the time of development.

(To be continued.)

WEIGHTS AND MEASURES IN PHOTOGRAPHY.

In the course of a criticism of the Chester Convention report on the above subject, *Anthony's Bulletin* says that the recommendations of the Convention are exceedingly simple, and well worthy of trial by all intelligent photographers. "The metric system is most assuredly the best to use, since measures and weights in this system can be purchased from any manufacturer of chemical apparatus, and the more enterprising of the photographic merchants. These weights and measures are just as cheap as those made upon the old system, notwithstanding any statement to the contrary. We have before us a price list of metric weights in which a set, 20 grams to $\frac{1}{100}$ of a gram, is marked at less than $2. These would be used for all small quantities. For larger quantities, up to 1,000 grams, a set of iron weights are listed at $1.25. Therefore, by the investment of $3.25 for weights, and not more than the same amount for measures for cubic centimetres, every possible contingency in the metric system would be met. This part of the recommendations given above we entirely agree with, but the use of ounces and grains is, to our minds, a delusion and a snare, and only tends to complicate a decimal system. If you get a set of weights on the grain system, you would need a set of measures on the same system, and these are not easily obtained. If you use ounces, and follow the decimal system, weights of

decimal parts of ounces would be necessary, and the corresponding fluid measures. At the present time decimal fractions of ounces and fluid ounces are unknown to us. We therefore protest most emphatically against the adoption of any such system. The metric system is so simple that we cannot believe there is a living photographer who is not intelligent enough to use it. All that has to be remembered is that 1 gram of water measures 1 cubic centimetre, and that these are multiplied and divided by tens. It seems to us almost impossible to conceive anything more simple. The difficulty has been, as we have said on a previous occasion, that writers on this subject have tended to complicate the system, as far as weights and measures are concerned, by introducing a lot of terms that are valueless, and serve only as an exhibition of their knowledge of Latin and Greek prefixes. The beauty of the metric system to all those who have used it is that the measures and weights are expressed in cubic centimetres and grams, and that the sub-divisions are decimal. If we were to write for a week we could not add anything to this, and the mere statement teaches the metric system. All that is necessary to carry it out is to buy the weights and measures and use them; they are infinitely easier to manage than any other system yet devised.

"The use of the metric system has become so important, and is so simple, that the Committee of Revision of the United States Pharmacopœia have decided to introduce it into the next edition of that important volume, which is now under consideration. This has been done after the mature deliberations of hundreds of physicians and druggists in the United States, who recently met in Washington, D.C., to consider the revision of the United States Pharmacopœia. It will therefore be essential for every druggist to understand the system, and surely photographers may readily do so.

"The other recommendations in the English report we heartily endorse. We would call special attention to paragraphs 5 and 6. It is extremely important to make solutions containing a definite number of parts of chemicals *in* a given volume, and not parts added *to* such volume. The use of correct terms either in weight or measure for liquids heavier or lighter than water is also often neglected.

"We hope that the time is near at hand when, 20 grains = 1 scruple; 3 scruples = 1 drachm; 8 drachms = 1 ounce; 16 ounces = 1 pound; with the fluid measure, 60 minims = 1 drachm; 8 drachms = 1 ounce; 16 ounces = 1 pint—will be things of the past. How different the metric system, 1 cubic centimetre of water = 1 grain!"

Photographic Club.—Subject for discussion on September 24, "Photographing Interiors"; October 1st, "Printing Clouds in Lantern Slides."

Meissonier's original painting named "1814," has been lately sold for £31,000. The picture measures nineteen inches high, and less than thirty inches in breadth, and a contemporary observes that the price given amounts to £58 per square inch, thus beating, by £2 per inch, Mr. Ruskin's Meissonier, measuring twelve inches by nine, which was sold in 1882 for £6,090. The Blenheim Raphael in the National Gallery, it is calculated, realised only £14 per inch; the Terburg, £21; and the small Correggio, £29. But it makes one sad to think of works of art being valued according to size. If this pernicious system received general adoption, the measurement in the case of certain large canvases hung so copiously in public galleries, especially in France, would have to be taken by the yard. The same rule would also apply to the enormous surfaces covered by the late Gustave Doré, and which are still the admiration of country visitors to Bond Street.

Patent Intelligence.

Applications for Letters Patent.

14,189. Victor Planchon, 45, Southampton Buildings, London, "Improvements Relating to Films for Use in Photography."—September 9th.

14,199. Joseph James Fosser and Thomas Naylor, 53, Chancery Lane, London, "Improvements in Photographic Cameras."—September 9th.

14,301. Cleopas Harris, 88, High Street, Merthyr Tydvil, "A Photographic Cutting or Trimming Plate, or Guage made of Metal."—September 11th.

Correspondence.

EDINBURGH PHOTOGRAPHIC EXHIBITION.

Dear Sir,—Will you please allow me, through your columns, to remind intending exhibitors at this Exhibition that applications for space should be in my hands not later than the end of the current month? I shall be happy to forward the official form of application to any who have not already received it, on applying to me at 180, Dalkeith Road, Edinburgh.

Edinburgh, 12th September. F. Barclay, *Secretary.*

HIDING DEFECTS IN PHOTOGRAPHIC PRINTS.

Sir,—As I read your paragraph (p. 699, September 5th, 1890), on "Hiding Photographic Defects," I am prompted to tell you a plan (a better plan, as I think, than the one described) which I have occasionally adopted for stopping out whites in the positive. Take a piece of ruby glass (pot metal) and place it upon a pad of soft putty, and with the coloured side up; then take a small archimedean drill moistened with turpentine, and drill away a spot of the coloured surface of the glass. The glass then can be manipulated over a positive, and the spot of white glass brought over the white or pale spot on the print, which may be thus actinically touched out. The process is, however, too tedious for extensive use. H. W.

Proceedings of Societies.

London and Provincial Photographic Association.

September 18th.—Mr. A. Mackie in the chair.

Mr. J. J. Briginshaw exhibited a flash-light lamp which embraced a novelty in the principle of its working. It consisted of a metal tube bent at right angles, at the top of which is fixed a vessel covered with fine gauze holding methylated spirit; at the other end of the tube a smaller tube is inserted sliding easily backward and forward; near the end of the inner tube is a small chamber with a slot corresponding with a similar opening in the outer tube, over which is fixed an upright cylindrical reservoir holding a quantity of magnesium powder; by sliding the inner tube forward the two openings are brought together, allowing sufficient magnesium powder for a charge to fall through into the chamber beneath, a spring forcing the inner tube back into position, ready for a discharge, which is made by pressure of a pneumatic ball and tube. This can be repeated until all the magnesium powder is exhausted. The lamp has been placed in the market by Messrs. Watson and Sons. An arrangement for fixing the tripod legs of a camera to prevent slipping was also shown.

Mr. F. A. Bridge exhibited some mechanical prints presented to him, when in Antwerp, by Mr. J. Maes, of that city.

Mr. W. E. Debenham read a paper on "Carbon Printing" (see page 733).

In reply to a question, what means he used to get purity of the high-lights in a carbon print, Mr. Debenham said he prepared the paper himself, omitting chrome alum, which is generally used in its preparation; the remaining trace of gelatine left in the high-lights must, of necessity, contain a trace of colour.

Mr. C. H. COOK had found, when squeegeeing the tissue on to the support, that bubbles sometimes appeared.

Mr. A. COWAN said, allowing bubbles to remain on the tissue in the preliminary soaking would be the cause; these should always be brushed off.

The CHAIRMAN asked if carbon prints could be intensified?

Mr. DEBENHAM would use permanganate of potash; he would always use a fresh bath each time for sensitising, adding sufficient ammouia to discharge the colour until it was of a pale lemon colour.

A questiou was raised whether any means existed to ascertain if carbon tissue had been exposed.

The CHAIRMAN said that if breathed upon the tissue would show the image.

Mr. C. E. Atkins was elected a member.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

September 8th.—Mr. HUMPHRIES, who occupied the chair, announced that it had been decided that articles which members only desired to dispose of might have a description of them placed upon the notice board, in the Club Room, if sent to the secretary, the usual commission of 5 per cent. being charged on sales effected.

The SECRETARY then read a paper which had been contributed on the subject of "Collotype Plate Making" (see page 737).

Mr. CHERRY said that in the specimen plates now placed before them for inspection in the different stages of preparation, there was one which, he understood, was ready to be inked up and printed from, but from an examiuation of it he failed to see how it could be possible to obtain any print from it, as there was scarcely any relief perceptible, and the image almost impossible to be seen except when so held that the light was reflected, and therefore the iuk would spread equally all over and block up the lights, and he should like to have the process explained more fully after the plate had been exposed behind the negative.

The SECRETARY (answering for the author of the paper, who had to leave before the discussion) said: The inability to appreciate the manner in which a print is made from such a plate arises from a misconception of the basis upon which the process is worked, as it does not depend upou the relief for the lights; but when the prepared gelatine is exposed behiud the negative, the light penetrating through that made it insoluble in those places, and incapable of absorbiug the hygroscopic substance, with which it was afterwards flooded, which was doue to cause those parts which had not been exposed to the light to repel the fatty ink; thus, the parts which had absorbed most moisture would not receive auy, while to that which was less moist more ink would attach, and in the parts most exposed to light the ink would attach itself thickly, forming deep shadows in the prints.

Mr. FORBES wished to know whether all those shown were collotype prints, or whether some which he pointed out were not on albumenised paper?

The SECRETARY: Those prints are all produced by the collotype process, the glossy surface beiug produced after printing.

Mr. PITHER: I notice that while some of these prints have an entirely matt surface, others have a finished glazed surface, and I should like to have an explanation of the manner in which this is produced.

The SECRETARY: It is obtained by what is known as the water varnish—that is, a solution is made of borax in water, and shellac is then dissolved in it; the paper is then floated on this which gives it the prepared face.

Ou Monday, September 22nd, Mr. C. Beadle will give a demonstration of lantern slide making. If time should permit, there will be a short discussion upon the merits of retouching on the same evening. Visitors are invited to attend.

ALL photographers will learn with regret that part of the Spanish Alhambra—the finest specimen of Moorish architecture extant—has fallen a victim to what is commonly called "the devouring element." We learn that steps have been taken to proceed with the work of restoration without delay.

Answers to Correspondents.

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

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

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

COLONEL WATERHOUSE.—*Reversed Prints.* Your photo-etchings from direct positives reversed with phenyl-thio-carbamide, appeared to us so extremely interesting and important, that we have had them framed and sent to the Pall Mall Exhibition. They arrived just in time to enable us to comply with the official regulations. We thank you for the accouut of the process by which they were produced.

H. R. L. (Taunton).—*Instantaneous Shutters.* Messrs. Sands and Hunter have a shutter which is capable of giving the extremely rapid exposures which you desire. We are, however, surprised to hear that you have failed with the iustrument mentioned in your letter; the large size of your plates increases the difficulty.

TOM (South Wales).—*Card Mounts.* The letter of advice and specimens, having been sent on to Leeds and just missed us there, prevents our reporting upon them this week.

A. P. (Birmingham).—*Making a Vignette Direct on the Negative.* A correspondent, under signature B. H. L., Loudon, W., has obligiugly furnished us with the following suggestion, founded upon his practice of thirty years ago:—"After exposure the plate was taken into the dark room. A candle was lighted, and the plate being removed from the carrier was held a few inches from the flame, whilst a disc, properly shaped aud made of blackened cardboard, was kept gently moving over the part inteuded to be preserved. The effect of this was to obliterate, by the stronger action of light, all the parts exposed to the candle, round about the portrait, leaviug a viguetted bust on development. A glass positive made in this way was easily reproduced as a negative."

B. H. L. is thanked for sending the preceding communication.

G. W. H. (Paignton).—*Ceramic Photography.* We are not aware that any full compendium of these processes has ever been published, but you will find much information on the subject in back numbers of the NEWS. Thus, "Mr. A. L. Henderson at Home; Euamel Photography in Practice," is to be found in our issue of March 16th, 1883; and MM. Joubert's and Germeuil-Bonnaud's processes were described iu the NEWS of July 12th and 19th, 1889.

A. B. (Preston) *Fading of Prints.* Received your letter of 7th inst., together with the two years old print, which entirely disposes of one of the causes suggested, viz., dampness of climate. Having been away from home, attending the Leeds meeting of the British Association, we have not yet had time to examine the mounts for any deleterious ingredients.

ENGRAVER.—*Sale of Photographs Produced on Commission.* You can restrain the promiscuous sale of photographs produced to your order, if executed as a commission, and paid for in such a manner as to cover the cost of taking the negative. In order to secure the copyright you might have registered the picture, but failing this, your rights ought to be respected.

L. P. S.—*Egg Albumen.* Except for leather dressing or as a mordant in calico printing, we do not know how the yolks of eggs could be applied. We presume you have offered them to local confectioners, who might go some length in assisting you.

G. B.—*The Photographic Exhibition.* It is now too late to seud in your intended exhibit. Monday, 15th inst., was the last day for receiving at Pall Mall.

H. F. L. (Rochdale).—*Retoucher's Manual.* Our publishers have a small work entitled "The Art of Retouching," by P. Piquepé, which gives all the inforuiation you require.

ANASTATIC.—*Course of Practical Instruction.* Ask for the prospectus of the Polytechnic Institution. Out-door practice is included.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1673.—*September* 26, 1890.

CONTENTS.

SERMONS IN STONES.

THERE are now happily so many cameras at work throughout the world—thanks to the convenience of dry plates—that it is only natural that the more earnest workers with the instrument should have begun to look upon it as something more than a mere toy, and a solace for idle hours. In this they follow the example of microscopists, many of whom originally took up that instrument as a source of amusement, the occupation gradually assuming the form of a hobby, until at last they devoted themselves to a definite branch of work, perhaps leading to the elucidation of some problem which had hitherto taxed all the resources of science. In like manner we can now point to photographers who have ceased to regard the camera save as a means of recording observations of various kinds, one devoting himself to a study of animal life, another to architecture, and so on.

But it is only recently that a serious attempt has been made to illustrate the noble science of geology in the only way that it can be satisfactorily pictured. One has only to turn to the crude pictures which a few years back were thought good enough to illustrate our text-books to know how much improvement was possible in this direction. A rough drawing, an imaginary section of the earth, or perhaps a sketch actually made in a quarry or railway cutting, was translated by the wood engraver to the best of his ability, with a result that was very far removed from the actual appearance of the thing represented. Still more is this observable in the case of other more marked physical phenomena—waterspouts, whirlpools, petrefactions, &c.—and more especially the lightning flash. Photography has changed all this, and we are now entering upon a new era, when the truthful lens, aided by the modern means of reproducing photographs for book illustration, will most certainly cast the rough woodcut to the winds.

Our readers have already learnt that the British Association some time back appointed a committee to collect and tabulate as many photographs having reference to geology as they could collect, and that their endeavours have met with a very encouraging result. It is in the power of nearly everyone who possesses a camera to contribute to this collection. He may possibly at first know not how to begin, and if he take up a book dealing with the subject, will perhaps be frightened by the number of unfamiliar terms which meet his eye. Of course much depends upon the particular volume which he selects, for some authors with heads full of knowledge of the matter in hand fail in their endeavours to convey it to others, except in a dry-as-dust kind of way which repels, rather than attracts. Others again make the most recondite subject so palatable, that it is like a pleasant story to read, and these gifted ones have made "fairy tales of science" a true title for their works. The would be-student can easily find out by enquiry in which author to put his trust, and with a little patient attention he will soon glean a general, if superficial, knowledge of geology, which will give every excursion from home a new interest, and which will most surely lead him to seek more information about the crust of the earth on which his life is passed.

There are naturally certain districts which are far richer in materials for study than others, and dwellers in those places have a great advantage from a photographic point of view. In the north of Ireland, for instance, where the molten basaltic rock at a past period of the earth's history has been forced through the overlying strata, until it to-day forms a vast district built up of columns, and hexagonal paving stones, we have a wonderland which culminates in the Giant's Causeway. But nearer home, in Yorkshire, there is a district of great interest which has not yet tempted as many photographers to visit it as one might wish. We mean the great limestone country—which is pierced in every direction with caverns—some with rivers and cataracts rushing through them, and some encrusted with stalactite and stalagmite.

But there are, in this country, many places where nature is pursuing her restless work in quieter fashion,

where photographic records would be valuable. Look at the many places on our Eastern coast, for example, where the sea is slowly eating up the land. Go south, and we can point to places where the soil is being silted up to such an extent that the reverse action is taking place, and new land is being formed. This is the case at more than one place on the Solent, and most notably at Sandwich, in Kent, which, at one time one of the famous Cinque ports, is now desolate, and two miles away from the breakers. It is pleasant, no doubt, to wander among the fields, or along the river bank with a camera, and to take pretty rustic pictures, but it gives a higher zest to one's leisure if there is some more definite purpose in view. The camera is a faithful reporter, and we can put it to less useful work than taking shorthand notes of "Sermons in Stones."

PHOTOGRAPHIC CONDITIONS IN SWITZERLAND.

THE tourist season in the heaven of photographers, Switzerland, is now over, and, taking it all through, it has not been a good one. The London daily newspapers have told, some weeks back, of storms and floods driving the majority of visitors back to the lowlands, and for a week the weather which preceded the opening of the Photographic Exhibition at Geneva, described last week in these pages, was bad. The Bise, a cold, dry northern wind, which afflicts Swiss localities, had been driving visitors from Geneva itself, to seek relaxation in the Riviera and more southern quarters, and Mr. and Mrs. Stanley, who were expected in Geneva, remained on the shores of the Lago Maggiore, and have since moved farther south.

Just before the opening of the Exhibition, however, the weather became sultry, and at its opening, and for four days thereafter, not a cloud obscured the face of the sun from morning till eve; the temperature at mid-day was sub-tropical, though cold at night. A fine time, this might be supposed, for photographing Mont Blanc and the higher Alps from points of view on the north of the lake. But the higher Alps are coy in presenting themselves. Sometimes, in a bad season, a photographer may be in the midst of the Alps for a month, and not see the higher summits because of the clouds. At Geneva last week they were hidden from another cause, the prevailing heat-haze, which limited vision to a few miles, although the weather would have been considered clear for work in less mountainous countries.

Those photographers who leave England for a limited time may have other causes of disappointment in attempting to work upon Swiss scenery. For instance, in the beautiful scenery of the valley of the Rhone, last week, the weather and the clouds were all that could have been desired, but the Föhn came down; the Föhn is a hot wind from Arabia, and in Italy is known as the Sirocco. Usually it is somewhat humid; this time it was as dry as a bone. Sometimes it lasts but four or five days; occasionally it continues for eleven or twelve days. Until last Tuesday it was blowing enough to carry any camera and its legs over precipices, and the ordinary devices of loading the camera with suspended stones, or steadying it with the india-rubber loop-link, would either have been of no use at all, or such an inconvenience as to have rendered life a burden. Those buildings in the Valais which were built of wood rocked to their foundations, and the cracking ceilings deposited pieces of mortar, like walnuts, upon the dwellers therein. The Föhn was particularly aggravating at night, destroying sleep, and performing its worst devilries just before daybreak. Only last Tuesday did it begin to calm, and to leave in its place rain and clouds.

Thus the higher Alps require waiting upon by the photographer, and are not at the beck and call of every visitor. In times past, we have known this hot wind to come over the Alps, and to put the Lake of Lucerne into such a boil that the large passenger steamboats were unable to run, and at Lucerne the waves were breaking upon the banks sufficiently to remind one of the sea-shore at Dover upon a breezy day.

Such facts are not advertised in guide-books, which do not state that it is possible to spend a limited time, more or less, close to the higher Alps without being able to see them. Practically, however, this is a minor loss. The scenery in view, under any conditions but those brought about by fog, is so fine, that the loss of a few white mountains in the distance need not be deplored, but the Föhn, when it is in high spirits, stops everything.

Once upon a time, the Lucernoise took their revenge upon the Föhn by burlesquing it at a carnival, in which it was represented as a great green dragon, disposed upon two cars drawn by six cream coloured bulls. The dragon was an effective one, having been designed by a French artist, and in its inside had about six men, who fired squibs through its mouth as it was drawn through the streets. A fairy, backed by a gigantic iridescent shell, stood upon its back, and holding the reins, apparently drove the ferocious beast, though the bulls had most to do with the locomotion, and we photographed the whole arrangement from the balconies af the Englisherof at Lucerne.

At Zermatt there was a spell of fine weather until last Monday night, and tourists had been up the Riffel pretty freely. The churchyard at Zermatt has a mournful record in the various tombs of those who have fallen victims to Alpine climbing, and at the present there is psychological gloom over the place, owing to the death of a German amateur photographer, M. Gœhrs, a young merchant of twenty-seven years of age, who had been staying at the Hotel Mont-Cervin since the 5th inst. On Thursday the 11th he set out with two guides and his apparatus, to make the ascension of the Matterhorn. That night they slept at the Cabin. The next morning they were joined by another party, and though they were occasionally separated, the two parties never lost sight of each other. At about half past seven the weather, which up to that time had been good, became very

RICHMOND BRIDGE.

stormy. The two caravans decided to return. A few minutes afterwards a guide belonging to the lower caravan, hearing some stones fall, turned, and saw Gœhrs, with his two unfortunate guides, all tied together by the rope, falling down the precipice which only ends in the glacier at Zermatt, where the three bodies were found the next morning. A pathetic incident connected with the accident is that on Thursday evening the mother, sister, and uncle of the deceased arrived at Zermatt. Gœhrs was the favourite of his family, and being anxious to "do" the Matterhorn, and at the same time cause no anxiety, had given orders at the hotel to say he had gone to the Breithorn. He had a future before him. His elder brother was killed on the battle-field of Beaugency in 1870.

The conditions affecting the establishment of a meteorological observatory at the Chalet des Bosses, near the top of Mont Blanc, attracted the attention of Section A at the meeting of the British Association at Leeds, the idea being to place there, during the summer months, self-recording instruments which will work by themselves for a few weeks, and then be visited by the responsible official. On inquiry, we were informed that these instruments were to be of a purely mechanical nature. It was admitted that photographic self-recording instruments would do better work; but the objection was the higher first cost of the photographic instruments.

Dr. Janssen has thus communicated his views of his recent ascent of Mont Blanc to the representative of *The Voltaire*:—"The ascent is an exceedingly painful task. You think only of one thing: to look where you step, so that you lose sight of the marvellous panorama unfolded on all sides. You have scarcely reached the summit when the guides hurry you off again. I have proved the possibility of mounting those precipitous heights in a sledge without bodily fatigue. During the entire ascent in that manner I was able to contemplate and admire the scenery. On reaching the top my brain seemed clearer than usual, and I was able to set about my observations and experiments without delay. I see no reason why an observatory should not be established at the Chalet des Bosses, two hours' distance from the summit, and at a height of 4,400 metres above the level of the sea."

OUR ILLUSTRATION.

We place before our readers this week a collotype print on rough paper in imitation of a sepia drawing, Mr. Cembrano kindly yielding to our request that he would lend us his negative for reproduction in this form. The subject is familiar enough to Londoners, for most of us manage to pay an occasional visit to Richmond, which is now so easy of access from the metropolis. But we venture to say that few would have been able to make such an effective picture from this view of Richmond Bridge. Mr. Cembrano has the rare faculty of appreciating a fine effect, and knows well enough whether it is capable of being reproduced as a photograph. He has seized upon this one at just the right moment, and the result is very charming. We may add that the negative is quite untouched.

ON THE REVERSAL OF THE NEGATIVE PHOTOGRAPHIC IMAGE BY THIO-CARBAMIDES.*

BY COLONEL J. WATERHOUSE, B.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

Eikonogen does not blacken or darken the alkaline precipitate much. Nitric acid clears the iodide, but the solution gives but little chloride with muriatic acid. This would seem to show that the iodide is not strongly reduced even by treatment with eikonogen.

Applied in a *strong* solution to a gelatino-bromide film, I have found it darkens the haloid salt of silver in the dark even without alkali, though this does not agree with its behaviour on the precipitated bromide.† When added in very small quantities to the eikonogen developer, it also causes reversal of the image, but in larger quantities it stops reversal. Its action generally seems much more irregular than that of the other thio-carbamides, and I have not yet been able to fully investigate it. It seems difficult to prepare the salt entirely free from the ordinary sulpho-cyanate of ammonia, and to this some of the irregular action may be due. With the hydroquinone developer given above, it produces reversal on Wratten's "ordinary" plates, and appears to be a very powerful accelerator both with this developer and with eikonogen.

I have also made a cursory examination of the effects of the simple *Carbamide or Urea*, which differs from thio-carbamide in containing oxygen in place of sulphur, its formula being $CO<^{NH_2}_{NH_2}$.

A 10 per cent. solution of urea produces no visible effect on silver bromide in the dark. Carbonate of soda added gives off no ammonia, but rather a smell of caustic alkali, and did not darken the bromide. Nitric acid dissolves no silver in the dark. With eikonogen the alkaline bromide was reduced at once to a dark grey. Nitric acid cleared off darkened product, and the solution gave an abundant precipitate of chloride with muriatic acid. With silver chloride treated in the same way carbonate of soda gives off no ammonia, but the same alkaline smell, and causes no darkening of the chloride. With eikonogen the alkaline chloride turned grey at once; nitric acid cleared, and muriatic acid gave a plentiful precipitate of chloride.

With the iodide very little visible change was effected by the soda solution or by eikonogen, though the latter turned it of a greenish-yellow.

Applied to an ordinary gelatine dry plate, a 10 per cent. solution did not *visibly* darken the film, either by itself or with carbonate of soda.†

Urea, used with the eikonogen developer, shows no tendency to cause reversal, whether used in the same small proportions as the thio-carbamides, or in larger ones. I have not yet tried it with other developers. As remarked before, this would seem to indicate that sulphur exerts a very important influence in causing the reversal. It may be noted, however, that sulpho-cyanate of ammonium, added to the eikonogen developer, though it produces a curious silvery metallic surface on the plate, shows no tendency to reversal; nor does hydrosulphate of ammonia, nor hyposulphite of soda. Mustard oil is itself somewhat soluble in water, and phenyl mustard oil (phenyl-thio-

* Continued from page 707.

† The experiments on the darkening and reducing action of all these thio-carbamides and urea on the silver haloids have given somewhat variable results, and require further investigation. There can, however, be no doubt of a *reducing* action taking place without the aid of light.

carbamide) slightly so when boiled. Mustard oil, with or without sulphite, seemed to act as a strong restrainer, the images being clear and weak, with no sign whatever of reversal. The phenyl-thio-carbamide gave a good, dense image with no abnormal effect whatever.

Alloxan, which is produced by the action of strong nitric acid on uric acid, proved a strong restrainer, and gave no sign of reversal when added to the eikonogen developer; indeed, its action seemed beneficial, as also did that of bichromate of potash, which equally showed no tendency to produce reversal.

I have not yet had an opportunity of investigating the action of the spectrum with reference to the reversal of the image with these thio-carbamides, but, from a trial made with a small direct-vision spectrograph on Wratten's plates, developed with eikonogen containing thio-sinamine, it was found that reversal took place only in the ultra-violet from the H-lines onwards; the blue and other rays towards the less refrangible end remained unreversed. With orthochromatic plates the same result was obtained. The addition of bromide to the developer was a great advantage in promoting the reversal and obtaining clear definition. Further trials with the diffraction spectrum appear to show that the reversal is almost entirely a matter of exposure, and may be obtained in any part of the spectrum.

The peculiar feature in these reversals with the thio-carbamides is, that the camera exposures are perfectly normal. Over-exposure prevents reversal, and the best results are obtained by somewhat under-exposing. Views with bright sky and dark foregrounds, or other subjects with strong contrasts of light and shade, are most difficult to obtain fully reversed. In copying it is not so difficult to obtain perfect reversal, though the lights leave much to be desired in clearness. I have tried various clearing agents, but so far without success, though further trial will probably give better results. The addition of bromide to the developer aids in keeping the lights clear, but in excess it attacks the lighter half-tones.

With the phenyl and allyl-thio-carbamides in some cases the image first of all develops quite normally, and then gradually changes, the shadows becoming dark and the lights paler, so as to show a positive image before fixing. In others, especially if a large proportion of the thio-carbamide is used, the image comes up foggy all over, and the reversal only appears on fixing. The reversing effect is most noticeable on the unexposed edges of the plate protected by the rabbet of the carrier, and these generally develop into a strong, dark border round the plate. Some of the images obtained have a beatiful rich effect, though not always perfect in the reversal nor clear in the lights.

On the whole, the best results have been obtained with the allyl-thio-carbamide, or thio-sinamine, and it seems likely that it will work well with hydroquinone, at any rate for copying. The images obtained with it are dense and full of detail, and quite different to the weak, grey reversed images produced by solarisation or over-exposure. Phenyl-thio-carbamide with bromide and ammonia, also works well with eikonogen, and gives fair clearness and density in copying.

As regards the theory of the action of these thio-carbamides in producing this remarkable reversal of the images, I have been so fully occupied with endeavouring to obtain some facts from which a theory might be deduced, and also to work out a practical process, that I have not yet been able to give much attention to the question of how the results are obtained. In any case, it would be difficult to offer a valid opinion in the present state of our knowledge of the curious phenomena connected with reversal and solarisation, and without knowing more of the delicate and complicated chemical reactions involved. The difficulty is increased by the fact that—at least, so far as I can ascertain from the text-books—there is no record of a substance which, added to the developer, will produce reversal with certainty. Eder notes that an excess of hyposulphite of soda in the ferrous oxalate developer will sometimes cause it.

The only parallel case of reversal I have been able to find is that recorded by Carey Lea as caused by the action of hypophosphite of soda on silver bromide films. I have, however, tried the hypophosphite in various ways on ordinary dry plates by treating them with solutions of different strengths, and then developing either wet or dry, or by adding the salt in various proportions to the developer; but neither with the eikonogen nor ferrous oxalate developers have I been able to obtain any sign of a tendency to reversal, and the same applies to solutions of glucose alone, or with ammonia, and of manna with soda. All these substances, applied to the film in various proportions, showed, especially the last, a marked increase of reduction and density on development, but no sign of reversal. The effect was quite different to that of the thio-carbamides, and the action of the latter in darkening and reducing the haloid salts of silver without the aid of light is immensely stronger.

I have not yet been able to enter into the question, but it seems not impossible that this darkening and reducing action of the thio-carbamides may have some bearing on the production of Carey Lea's photo-salts, though, if any such salts are produced, they would probably contain sulphur.

(*To be continued.*)

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—A technical meeting will be held on Tuesday, September 30th, at 8 p.m., in the Exhibition Gallery, 5A, Pall Mall East.

THE true value of art lies in choice of subject. It is idle to talk about the lofty and the ideal in an art unless the subjects upon which that art is exercised are worthy. There must be a subject which demands the artist's best powers for its expression; the treatment of the subject must be in a measure governed by the emphasis laid upon its poetic elements, and the artist himself must have that seer's insight which reveals to him the deeper meanings in all that his art is exercised upon. It is said that Millet imposed upon himself a "mission;" that he felt impelled by strong convictions of duty to paint the sadness and dignity of agricultural life; that he read his Bible nightly, and believed what he read. That a man should paint under the influence of such impulses, and paint pictures of striking power, seems to a technical critic not only distasteful, but incomprehensible. Indeed, one of the modern critics, in despair at such a phenomenon in the French art world, is driven to express his opinion that this peasant, with his Bible readings, his convictions, his love of the labourer, and his wooden sabots, must have been a good deal of a charlatan, and all these things a kind of pose. But if Millet had a "mission," let us hope that more artists will be inspired in the same way. There are none too many prophets willing to go into the wilderness and endure hardship for the truth's sake. The world needs such in art to protest against mere cunning imitation, and to insist upon offering to man's love of the beautiful something better than sensuous beauty, something which is not only beautiful to the eye, but lovely to the thought, inspiring to the imagination, charming to the fancy, and uplifting to the spirit.—*Scribner's Magazine.*

THE CHEMISTRY OF PHOTOGRAPHY.*

BY DR. F. CRESSWELL, L.R.C.P., M.R.C.S.

Many substances undergo change under the influence of light; for instance, carmine slowly decolourises: on the other hand, plants, if grown in the dark, are colourless, but become green by exposure to light. But the changes which take place in photography are chiefly :—

1st. The reduction to the metallic state of haloid salts of silver.

2nd. The reduction of the persalts of iron to protosalts.

3rd. The reduction of chromic acid to chromic oxide.

Of these the *first* is the essential of Daguerreotype, Talbot-type, collodion process of Archer, dry plates, bromide and silver printing, and all the modifications of gelatino and collodio printing-out emulsions, such as aristotype, Obernetter, &c.

The *second* is the basis of platinotype, ferro-prussiate, cyanotype, and the new Kalitype process. The latter Dr. Cresswell thinks will have a good future, now that the price of platinum is so high, and supply so limited, and as results almost equal to platinotype appear to be obtainable by it.

The *third* is used in carbon or autotype printing, the dusting-on process, and most of the photo-mechanical processes.

The object of albumenizing the paper, or adding gelatine to the salting solution in the case of plain paper, is to retain the silver chloride on the surface, and prevent waste by its sinking into the fibre. It is usual to tone the prints with a solution of chloride of gold.

The sub-chloride will remove chlorine from the gold, which consequently is deposited, and chloride of silver is formed; hence the reason for toning before fixing. It is perfectly easy to tone after fixing, but the result would be a fresh formation of chloride of silver, which, not being soluble in the toning bath, would be liable to blacken and deteriorate the print; but in the fixing bath the chloride is removed at the same time as that which was unacted on by light. By using borax, acetate, phosphate, or tungstate of soda in the toning bath, they have a slight attraction for chlorine, and reduce the trichloride of gold to the state of mono-chloride, and thus one molecule of sub-chloride of silver deposits one atom of gold, instead of its requiring three molecules to deposit this amount, and thus the image is less weakened than it otherwise would be. The state of aggregation, and also the colour of the deposit, are also modified by the special salt used.

An emulsion differs from a solution in that it consists of particles not dissolved, but merely suspended in a more or less viscid fluid; milk is a good example of an emulsion. Photographic emulsions require to be boiled for a certain time; the molecules appear to become disturbed in the same way that they do under the influence of light. If the boiling is too long, a plate coated with the emulsion will fog on development without having been exposed.

Gallic acid is a feeble reducing agent, but now pyrogallic acid, which is really a triatomic alcohol, and hydrokinone and pyrocatechin, which are its allied diatomic alcohols, are far more generally used; and now eikonogen, which is merely a fanciful name for amido-β-naphthol-monosulphonate of soda, seems likely to be very generally used where softness is the object in view.

* Report of a paper read at the Enfield Camera Club.

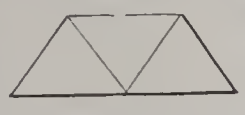
The restraining effect of a soluble bromide in the developer is not easy to explain satisfactorily. It is possible that it offers a distraction, if one may so term it, almost yielding its own bromide to assist in oxidising the developer, and possibly tending also to restore the bromide of silver to its primitive condition, and suppress the latent image.

Alum tends greatly to interfere with the absorption of water by gelatine, and its consequent swelling; it also (especially in the presence of free acids) can dissolve out the brown stain left by some of the oxidation products of pyrogallol; hence a bath of it is recommended either before or after fixing, or both. Many makers now add a small quantity of chrome alum to the emulsion, which is far more active than ordinary alum, and prevents the film swelling, and consequently blistering and frilling. If to the fixing bath some bisulphite of soda, commonly called acid sulphite of soda, be added, it will completely bleach all pyro stain; and what is more, the hyposulphite of silver and soda formed in fixing will remain dissolved indefinitely, instead of being deposited as a dirty brown mud as usual, the fixing bath remaining for weeks perfectly clear and bright.

It is a very good plan with both plates and emulsion paper, after fixing, to immerse them for about fifteen minutes in a 2 per cent. or 3 per cent. solution of chrome alum; this causes the gelatine to shrink and eliminate most of its absorbed water, and also renders it quite insoluble; and further, it destroys any hypo which may have been left in the film. After this treatment it is possible to dry a plate at the fire without fear of the film melting; the film, when dry, is exceedingly hard and horny. The plate must be washed both before and after using the chrome alum, but a much shorter time will be sufficient, as no hypo can exist for more than a few minutes in its presence.

FLUOR SPAR IN OPTICAL INSTRUMENTS.

In a paper upon the above subject by Professor Sylvanus Thompson, read before Section A of the British Association, the author said that the use of fluor spar in lenses renders less curvature necessary, therefore higher definition is obtained. He described a new direct vision prism made as represented in the accompanying cut, in which an Iceland spar prism is cemented between two fluor spar prisms, by which means the light is polarised as well as dispersed. He also described a compound prism in which a dense flint glass prism is sandwiched between the other two of fluor spar; this arrangement gives wider dispersion.



A discussion followed, in the course of which Sir William Thompson said that the arrangement was a beautiful one. Mr. Glazebrook stated that he had had difficulty in getting suitable fluor spar for optical purposes: the largest piece he could obtain was of pyramidal form, two inches square at the base, and about two inches high. Professor Fitzgerald stated that fluor spar is not very hard, but a little harder than Iceland spar.

Nitric Acid Fumes.—Two members of the Newcastle Fire Brigade, it is reported, died on Tuesday, while the superintendent remains in a dangerous condition, from the effects of the fumes of nitric acid inhaled in extinguishing a fire on the premises of Messrs. Mawson and Swan, Mosley Street, Newcastle.

PHOTOGRAPHIC COPYING AND PROJECTION APPLIANCES.

ONE of the papers read before Section A of the British Association was by Professors Barr and Stroud, of Leeds, who said that photographic lantern slides were much used in popular lectures, but had not hitherto been applied to any great extent in class-room work because of various drawbacks, such as the necessity for employing an assistant and the darkening of the room. By the method they were about to describe, a slight darkening only of the room was necessary, so slight that the students could see to take notes.

Their class-room, they said, has a number of beams, such as A E F, across the celling, with lights at H K on both sides of the beam A. L N are two black-boards, and M an inclined white lantern screen, with a projecting ledge at the top to prevent direct light from H and K falling upon the face of the screen. T is the lecturer's table, and W the optical lantern pointing upwards to the screen M, and under the direct control of the speaker. The projection-lens of the lantern is of short focus. The slides are laid out upon white paper alongside the lantern upon the table, and the direct light from above enables the speaker with ease to select any slide he requires for the purposes of illustration. The lantern slides are made on the premises, and about fifty per week are turned out for teaching purposes in the Yorkshire College of Science.

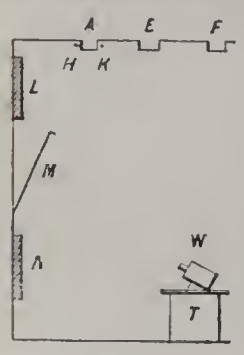


Fig. 1.

An optical lantern in use at the College is represented in fig. 2, in which A is the light, E a lantern condenser consisting of two plano-convex lenses, at such a distance from the light as to give parallel rays; F is a mirror hinged at its upper end, and in the diagram it is represented as placed at an angle of 45° to throw the rays upwards through the lens K, which renders the rays convergent; they next pass through the projection-lens N, and are reflected to the screen by the mirror W. When the mirror F is raised until it is parallel with the top of the lantern the light is cut off from the lens K, and passes through the lens H, after which it may be made to pass through a lantern slide and projection-lens, so as to throw an image upon the screen direct. Drawings may be made upon any transparent film or plate laid upon the top of the lens K, and the progress of the drawing be seen upon the screen; and certain suitable chemical or physical experiments may be performed on the top of the lens K, and thus be represented on an enlarged scale on the screen. When one lantern slide is placed just before H, and another just over the lens K, dissolving-view effects can be produced by suitably moving the mirror F.

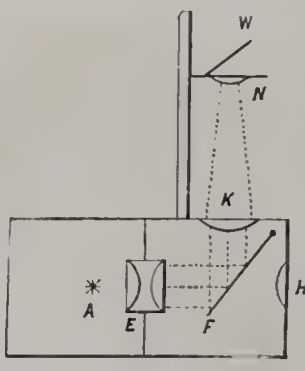


Fig. 2.

A part of the apparatus used at the Yorkshire College in copying may be explained by the aid of fig. 3, in which A E is a board, upon which rests the open book H, with one of its covers and some of its pages hanging down; the front vertical page opposite A K contains the engraving which has to be copied, and which is illuminated from the front by two artificial lights. The general appearance of the arrangement from the front may be indicated by fig. 4, in which A H is a kind of box, but open at the front and back, and N M is the page of the book hanging down. K L are two small vertical boards, which can be moved towards or from each other, but the boards are always equadistant from an imaginary vertical line between them. The shaded portion of the diagram represents the engraving to be copied. Thus, when any picture is arranged so that it is bounded by the two boards, it is truly centred so far as the horizontal position is concerned. The two boards also serve the purpose of keeping the pages flat.

Fig. 3.

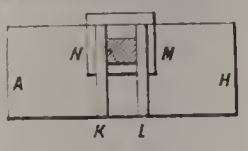


Fig. 4.

The picture in the book being always truly centred horizontally, the camera requires but adjustment for the vertical position, and the principle by which this is effected may be explained by the aid of fig. 5, in which the base A H is always at the same level, and base L Z, on which the camera is fixed, can be placed at any level by a slot and screw arrangement represented above N. To keep the upper base-board steady, two boards, W M, are hinged to the upper and lower bases; they are likewise firmly hinged to each other at K; this prevents vibration in one direction. Another pair of hinged boards, T V, is at right angles to the pair of boards just described, and prevents vibration in another direction. The whole of the arrangement just described runs upon rails in front of the picture, and can be fixed at any point. No focussing by the aid of vision is necessary with this apparatus, which is suitably provided with pointers and graduated scales, so that all can be done by measurement.

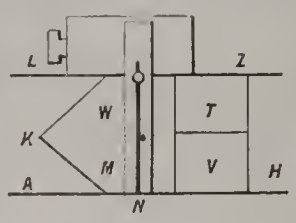


Fig. 5.

After Professors Barr and Stroud had explained the nature of the apparatus, the following discussion took place:—

Dr. Oliver Lodge was pleased with the extreme beauty of the contrivance for centreing. He was in the habit of throwing lantern views upon the screen without darkening the room; he used an oil-silk screen, very translucent, and but three feet square, so as to obtain strong illumination; stray light must be excluded from the back of this arrangement, but light in front does no harm.

Dr. Jacobs had for a long time used the apparatus described by the authors of the paper, and lantern slides could quickly be turned out by its employment. He used daylight instead of artificial illumination. At a large technical school connected with the Mechanics' Institute in Leeds they had two screens fitted up as described, so that such were not in use at the Yorkshire College alone.

Professor Barrett used a small screen and a strong light. He did not quite agree with Professor Lodge as to the value of highly translucent screens; they were all very well for observers in front, but those at the side could not see so perfectly. He had tried glow lamps in the lantern, but they gave off too much heat.

Professor Fitzgerald asked if it was easy to colour slides, for the introduction of colour was sometimes necessary for scientific purposes.

Professor Barr said that the screen the authors of the paper

used was about five feet square; with a translucent screen, the speaker for some purposes requires the assistance of another person. An objection to the use of daylight in making the slides was the varying character of the illumination, and the operator then cannot always depend upon working with ease and certainty all day, whereas suitable artificial light can always be trusted. The apparatus which had been described could be used for copying negatives, and in some cases for copying natural objects; in copyiug negatives a sheet of white paper was placed behind. He had had no experience in colouriug lantern slides, but any man who did the colouring for scientific purposes should have a knowledge of the subject in relation to which each slide was to be used.

Professor Stroud said that there was little loss of light by the use of the two reflecting mirrors in the lantern he had described; the upper mirror must be a true one, but good looking-glass would answer for the lower.

The chairman, Dr. J. W. L. Glaisher, remarked that much mechanical skill had been devoted to the construction of the apparatus brought before the Section.

THE BRITISH ASSOCIATION COMMITTEE ON GEOLOGICAL PHOTOGRAPHS.*

Shropshire.—Caradoc Field Club (photographed by W. W. Watts, Sidney College, Cambridge), size 4 by 3½ inches:—Registered No., 80, Minsterley (road to Bishop's Castle), 1887 (1)—Section at Hope Dingle, showing unconformable junction of Silurian on Ordovician; 81, ditto (near Fox Inn), 3—Basin produced by folding of beds of Middle Areuig Ash; 82, Pontesbury (Nills Hill) 1887, 6—Stiperstones (Quartzite); 83, ditto (7)—ditto; 84, Minsterley (Tasgar Quarry), 8—Upper Arenig Ash; 85, Whitlery Bridge (9)—Whitlery Ash (Bala or Lower Caradoc age); 86, Wotherton (Barytes Mine), 1885 (10)—Fault in Whitlery Ash; 87, Todleth Hill (E. Side Farm), 1885, 11—Crags overlooking Hurdley, columnar intrusive andesite; Much Wenlock—Wenlock limestones; Wrekiu, from Beuthal Edge, Broseley (Corbett's Dingle)—Bedding and jointing in carboniferous saudstone.

Yorkshire.—Per Arthur S. Reid, Trinity College, Glenalmond, N.B. (photographed by Dr. E. S. Reid):—Registered Ro., 39, 40, Draughton (near Skipton)—Contorted limestoue; 41, Boltou Abbey—Faulted synclinal in limestone. Yorkshire Geological and Polytechnic Society (per James W. Davis) Chevinedge, Halifax; size 11 by 8 inches:—Registered No. 19, Raygill Quarries, with fissures, 1875; 20, Plumpton Rocks, 1879; 21, Scarborough Castle, 1883—Nodular concretions in calcareous grit; 22, Wadsley (near Sheffield), 1876—Fossil trees in lower coal measures; 23, 24, Flamboro' Head, 1882—Erosion of chalk; 25, ditto—Thorwick Bay—Chalk surmouuted by drift: 26, Clayton (near Halifax), 1886—Roots of stigmaria; 27, Hilderthorpe, 1887—Current-bedded sands; Draughton, 1871—Contorted limestone; Moughton Fell, 1877—Junction of Silurian with Carboniferous limestone; Gordale Scar, 1878; Raygill Fissure, 1880—During exploration; Norber, 1881—Erratic blocks; Bempton Cliffs, 1885—Contorted chalk. Per Yorkshire Naturalists' Union, Geol. Photo. Section (photographs taken for the Leeds Geological Association,† by F. W. Branson, 14, Commercial Street, Leeds), size 7 by 5 inches; enlarged series 14 by 10 inches:—138, Longley's Brick Works, Leeds—Coal measures above "Beeston" bed; 139, Grosvenor's Yard—"Beestou" bed (8 to 9 feet) and Coal measures; 140, Boyle's Quarry—General Section, "Crow coal" and Coal measures above and below; 141, ditto—ditto (detailed); 142, Dolly Lane, Brick Yard—"Black red" coal; 143, Benson Street, Brick Yard—"Better bed" coal, &c.; (photographed by J. E. Bedford, Cardigan Road, Leeds (for Leeds Geological Associatiou, size 6 by 4 inches):—144, Armley (near Leeds) 1882—Elland flagstones; ruptured shales and flagstones; 145, Draughton (near Skipton) 1885—Contorted limestone (anticlinal and synclinal); 146, ditto, 1885—Slickenside at side of an anticlinal; 147, Bridlington, 1886—Cross-bedding in gravel; 148, ditto—Freshwater gravel on boulder clay; 149, ditto—Lake deposit lying on boulder clay; 150, Filey, 1886—Drift lying upon Oolitic limestone, showing atmospheric denudation; 151, ditto—ditto; 152, The Brig Filey—Oolitic beds at the Brig; (photographed by A. E. Nicholls, Borough Engineer's Office, Leeds, for Leeds Geological Association, size 6 by 4 inches):—153-5, Castleford, 1890—Three views of fossil tree stem *in situ* in coal measures; 156, Haddockstones, 1889, between Markington and Ripon—Isolated blocks of Plumpton grit; 157, 158, Sections on new railway, 1889, Ilkley to Skipton—Vertical and contorted Carboniferous limestone; 159-164, Garforth and S. Milford, 1889—Six views of Quarries in Magnesium limestone, showing methods of quarrying and varieties in bedding; 165, Knaresborough Castle, 1888—Base of Magnesium limestoue, with underlying "3rd" grit; 166, ditto, 1888—Plumpton rocks; 167, Dudley Hill, Bradford, 1890—Lower Carboniferous sandstone; 168, 169, Brough (near Hull), 1889—Post-tertiary gravels, resting on Oolitic outlier at base of the chalk wolds. Photographed by Godfrey Biugley (for Leeds Geological Association), 15 Cardigan Road, Headingley, Leeds; size various:—Registered No. 170, 171, Burnsall (near Skipton) 1890—Ridge of limestone crossing valley of the Wharfe: 172, Saltburn, 1888—View of drift hills; 173, ditto—Valley cut in drift; 174, ditto—Sandhills and drift; 175, ditto, Hunt Cliff, 1888—Middle Lias and ironstone band; 176, Whitby Scar, 1888—Lias and Oolite; 177, Staithes (Penny Nab) 1888—Middle Lias; 178, ditto (Colborn Nab) 1888—ditto; 179, Hayburn Wyke (near Scarborough) 1887—Sea cliff and waterfall; 187, ditto—Lower Shale and sandstone, Oolite; 180, Thornton Force, Ingleton, 1890—Base of Carboniferous limestone, resting uncomformably on Silurian; 181-184, Norber (near Clapham) 1889—Erratic blocks of Silurian grit resting on Carboniferous limestone; 185, Ewe Nab, Carnehan Bay, 1887; 186, Scarborough Cliffs (near the Spa); 188, Headingley, Leeds, 1888—Cliff in Lower coal measures; 189, 190, Adel Moor, Leeds, 1890—Large weathered blocks of Millstone grit (*in situ*); 191, Bolton Abbey—Yoredale shales; 192, Bolton Woods, 1888—Valley of the Strid through Millstone grit; 193, Flamborough, 1887—Arch in chalk cliff; 194, ditto, Chalk cliff; 195, ditto, Thornwick Bay—Caves in chalk; 196, ditto—showing marine erosion of chalk beneath and atmospheric action denuding drift above.

(To be continued.)

* Continued from page 729.

† These were photographed in 1885, and were temporary sections, but extremely valuable as showing the succession in the Lower coal measures from above the "Beeston" bed to those immediately above the Elland flagstone.—S. A. Adamson.

London and Provincial Photographic Association.—The following will be the subjects for consideration on the dates named:—October 2nd, "Keeping and Testing Sulphite of Soda"; October 9th, first Lantern Night, and Demonstration on Lantern Objectives by Mr. T. E. Freshwater; October 11th, "Pictorial Definition," adjourned discussion resumed by Mr. W. E. Debenham.

A Useful Novelty.—We have received a variety of samples of a novelty which photographers can turn to good advantage. The novelty consists in producing transparent or water-marks in paper, which is accomplished in the following manner:—Paper is first coated with a mixture of gelatine, sugar, and bichromate of potassium. When dry, print under a negative in direct sunlight. Develop simply in hot water, same as a carbon print; the hot water washes out all the gelatine not rendered insoluble by the action of light, leaving a picture in high relief, which is hardened with alum. After being thoroughly dried, it is simply passed through a roller press, together with a sheet of thin paper or cardboard, which produces the water-mark effect. There are many applications to which this process can be applied for advertising purposes, for making bank cheques and official documents with a peculiar private mark, or the portrait of the individual who signs the cheque; or it can be used in making fancy stationery, note paper, visiting cards, with portrait of sender, fancy designs, &c., all of which are prominently visible when viewed by transmitted light. There are many ways where this process may be made useful as well as ornamental, which will suggest themselves to the ingenious worker. We are not certain that the relief could not be used for taking inked impressions from.—*St. Louis Photographer.*

Notes.

"The greatest wonder of the age! It will take your portrait as good as a photograph, and much more like the original." These words arrested our attention the other day, hard by the Strand, where an itinerant vendor was surrounded by a small knot of idlers. We had before heard of cheap apparatus, but were not prepared to learn that it had at last come down to the level of the humble penny; so we paused in order to become better informed. The street merchant produced a tiny metal frame—like that commonly used for ferrotype portraits—which appeared to have in it a piece of plain, transparent glass. He invited one of the crowd to breathe on the back of this glass, when there appeared thereon the word "myself." The frame was now reversed and again breathed upon, when there appeared the head of an animal with elongated ears—the only token that it was meant to portray the genus "moke."

A short time ago this time-honoured joke was met with in Paris in yet another form, through the medium of the penny-in-the-slot principle. You were invited to drop your coin into the apparatus, when your portrait would appear, and you were rewarded for the loss of your money by the apparition of a donkey's head. It would be interesting to know why the patient animal with the ears should be associated with foolishness, for a properly cared for donkey is by no means a stupid creature. But the joke is certainly an old one, as is evident from certain well-known carieatures which date from the beginning of the Christian era. It was, we believe, Scribe who, in reply to a nobleman who wished that writer to produce a work with his (the nobleman's) name attached to it as author, said that it was forbidden by scripture to link the horse and the ass together. The nobleman was equal to the occasion, and demanded in return what Scribe meant by calling him a horse?

The seller of penny toys has not, as yet, invaded the photographic world to any great extent. Expense, trouble, and ignorance of chemical operations stand in his way. It would hardly pay him to produce "magic photographs"—*i.e.*, prints bleached out with mercury, and capable of being rendered visible once more by hypo-saturated blotting paper—for one penny, but perhaps it will be done some day. The penny-in-the slot company is the nearest approach to abnormal cheapness, but this, for some reason, hangs fire, although the requisite capital to launch the enterprise was long ago subscribed by a confiding public.

These penny vendors and street sellers generally would themselves form a not uninteresting portrait gallery. How familiar are some of those faces to him whose work takes him citywards day by day, and how some of the unfortunate creatures have disappeared from the seedy ranks even within our own memory. Where, for instance, is the simpering vendor of "brandy balls! balls! balls!" with his tasselled cap and white apron? Where is the hump-backed man who used to sell newspapers on London Bridge Steamboat Pier, and where is the blind man with one ear who used to haunt the neighbourhood of Charing Cross? It is not, perhaps, generally known who these last two really were. The first was a released convict, who, at one time, grossly insulted the Queen; and the man with one ear was Burke, who gave evidence against his accomplice Hare in the awful body-snatching cases at Edinburgh. What experiences of human misery could not some of these wanderers tell us about.

"Fools rush in where angels fear to tread." We rather fancy this proverb will have to be reversed in the case of lady photographers. Gallantry forbids us to call them fools. The reflection is suggested by the statement that Mrs. N. Grey Bartlett, of Chicago, the wife of a prominent analytical chemist, has made an important discovery, by which photographs can be produced without the old-time process of working in a dark room for hours, and staining the fingers. By her process, there is nothing to be done but to expose the negative, with the sheet of paper beneath it, for a few minutes to the light. The pictures produced by Mrs. Bartlett's process are said to have the appearance of fine etchings. The developing solution is stained with ruby dye, which prevents white light from reaching the plate after being immersed in the liquid. This is very interesting, but so very, very old.

A useful association, called the Fire Brigade Reserve—the object of which is to find employment for private firemen out of situations, and form for them a sort of provident association—has, on its application sheet for membership, what appears at first sight a rather curious question. The question runs thus: "If elected, would you deliver to the manager a recently executed photograph of yourself?" On enquiring the reason for this rule, we were told that the photographs were found very useful in two ways. When an employer wants a fireman to take charge of his theatre, warehouse, manufactory, or what not, the collection of photographs is shown him, and he picks out the man he fancies. The second object to which the photograph may be applied is one which, we hope, is rarely necessary. Supposing a man, when in a place of trust, should commit an offence and abscond, the photograph is very useful for purposes of identification.

There is, after all, nothing very new in the first purpose for which the photograph is needed, as for some years past the sending of a photograph has been made an essential condition on the part of applicants who from a distance apply for a situation. As to the second purpose, it might be extended with advantage. Occasionally, bank clerks disappear mysteriously, and so do collectors in various establishments. If the depositing of a photograph were made a *sine quâ non* on the part of all employées who have the handling of

money, it might act as a deterrent to those who are dishonestly inclined, and who find a difficulty in resisting temptation.

A Canadian photographer has just been distinguishing himself as an acrobat. His name is Samuel Dixon, and he hails from Toronto. Recently, in the presence of a multitude of spectators, he crossed the Niagara Falls on a rope stretched from shore to shore. When midway across, he stopped and performed various acrobatic feats; but we are not told whether he was accompanied by his camera, and whether he took a photograph of the multitude while on the tight-rope. This would be an altogether unique achievement, and we trust Mr. Dixon was not so wanting in professional ardour as to neglect this splendid opportunity of what may be called elevated photography.

Mr. Dixon, however, is not the first gymnastic photographer. The celebrated "Lu-lu," known, perhaps, better now as Mr. Farini, is a skilled photographer, and the elder Mr. Farini's book, "Across the Kalihari Desert," contains several astonishing photographic feats, as we noted at the time the book was published. It may be interesting also to know, as a matter of photographic history, that, in the old glass-positive days, photography was found to work very well with acrobatism. Not a few hard-working men practised photography in the daytime, and twisted their bodies into knots at the various minor music-halls in the evening.

Art is progressing rapidly. Even the humble chalk artist of the paving stones finds it necessary to move with the times. The other afternoon, in a well-known London thoroughfare, we noticed a gentleman of the pavement preparing his work, and was busily rubbing in a portrait of Mr. H. M. Stanley from a photograph which he had before him. Next we shall be seeing him draw from life the broken plate, the mackerel, the pound of cheese, and all the rest of the still life which this particular school of art affects.

Judging by the reluctance which convicts generally show when requested to have their portraits taken, it would be interesting to know what the gentlemen incarcerated in the Parkhurst Prison think at being asked to build a studio for taking their own photographs, for witness against themselves should they ever be re-convicted. But perhaps the authorities were sufficiently astute to deceive them on this point; and yet, on second thoughts, this would be rather a difficult undertaking. Somehow a photographic studio—or, as the convict would put it, a place for taking likenesses in—is unlike anything else. It certainly bears a resemblance to a conservatory, and yet it is totally unlike, unless, indeed, the studio now building at Parkhurst is anything like the one in the Ordnance Office, Southampton. The Southampton establishment is a conservatory pure and simple, in an isolated position, and elevated in the air. Probably it is none the worse for this.

The difficulty which all amateur photographers have in instantaneous work in the streets is to make sure they have got upon the field the object they want to take. An amateur came home in the seventh heaven of delight the other day from the laying of a foundation-stone. He had got a portrait of the Prince and Princess of Wales with his detective camera, having been fortunate enough to secure a capital position. He at once rushed to his dark room, proceeded to develop, and the plate revealed a capital picture of two uninteresting reporters! We need not record the language used by the amateur on this occasion. He believed that some ill-natured person jogged his arm at the very moment of exposure.

It is said that a certain Capt. Illarinoff, a Russian, is about to start on a riding tour, visiting all the European capitals. He is armed with a phonograph, and also with a detective camera. With the first he will record the utterances of the victims he intends to interview; with the second he will secure their portraits. The material, literary and pictorial, he will afterwards manipulate into a lecture, which, of course, will be illustrated by the indispensable optical lantern. This seems to be a very admirable idea, but will require an enormous amount of coolness, tact, courage, and endurance. Some celebrities—Bismarck, for instance—have a rooted and unreasonable objection to being interviewed. The probability is, that Capt. Illarinoff will have the opportunity of exhibiting a photograph of an irate celebrity ejecting him forcibly from his premises, accompanied by a phonographic record of what the celebrity said on this occasion.

The photograph taken of a great fishing contest, on Sunday week, on the Arun, when nearly three hundred anglers competed, ought to make a very interesting picture. We are not informed whether the photographer was also an angler. We believe that the angler-photographer is considered by his friends who practise the gentle craft as rather a nuisance. He is wanting in that steadfastness of purpose and patience which are necessary qualities in your angler. We are inclined to think that the better way to get over the difficulty would be to have an amateur photographer who is not an angler attached to each angling club. The photographer's work should be confined to photographing the spoil, because this is all the angler cares for; beauty of scenery is to him of no importance. Artists are generally very inaccurate when they make drawings of fish, and photographs would be very valuable in this direction. Besides, photographs would also be useful in the interests of truth. Anglers have an amiable weakness of enlarging the weight and size of the fish abnormally, and a photograph might act as a valuable check upon the imagination.

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

IV.—GRADATION.

THE above experiments have shown that, with a well-balanced developer, there is a limit to density, which depends upon the action of the light, and that, so far, the only control the photographer has lies in deciding whether he will reach that limit or not.

It also became evident that if two different densities be developed upon the same plate to their extreme limits, the ratio existing between these limits must depend solely upon the action of the light. The question we have now to consider is whether it is possible, by any modification of development, to influence this ratio, and whether this same ratio exists at all stages of development.

In making these experiments, the source of light we have adopted is a standard candle placed at one metre distance from the plate. We then produce a number of gradations upon the plate by exposing different portions of it to the light for different periods of time, always leaving one portion of the plate unexposed.

In order to show that the length of time of development does not affect the ratio of densities among themselves, but increases every density by proportional amounts, we give the following experiments, made with various plates, ferrous oxalate being the developer used. The tables show the densities obtained, their ratio among themselves, and the ratios of the two corresponding densities obtained by long and short development.

All densities are given exclusive of fog (the density of unexposed plate being subtracted from density of exposed plate).

Experiment 13.—Gradations. Ferrous oxalate.

Plate used	Exposure C.M.S.	Short Development, 4 Minutes		Long Development. 12 Minutes		Ratio. $\frac{D_2}{D_1}$	Remarks.
		Density D_1.	Ratio.	Density D_2.	Ratio		
Ilford Red Label. (1.)	10	·775	1·0	1·260	1·0	1·63	Greatest error, ± 2·4 per cent.
	20	1·000	1·29	1·660	1·31	1·66	
	40	1·180	1·52	1·96	1·55	1·66	
	80	1·250	1·61	2·08	1·65	1·60	
					Mean.....	1·64	
Wratten's Drop Shutter. (2.)	10	1·17	1·0	1·74	1·0	1·50	Greatest error, ± 3·4 per cent.
	20	1·67	1·42	2·37	1·36	1·42	
	40	2·06	1·76	2·91	1·67	1·41	
	80	2·26	1·93	3·33	1·91	1·47	
					Mean.....	1·45	
"United Kingdom." (3.)	10	·160	1·0	·275	1·0	1·70	Greatest error, ± 5 per cent.
	20	·313	1·95	·485	1·76	1·55	
	40	·518	3·23	·830	3·01	1·60	
	80	·703	4·39	1·145	4·14	1·63	
					Mean.....	1·62	

The greatest errors are comprised within those limits within which our method of measuring densities is only reliable.

The results clearly show that the ratio of densities is given by the light alone, and is not affected by the time of development, a fact quite in accordance with the conclusions previously arrived at.

This ratio, we find, is altogether unalterable. No modifications we have made in developers or in development have ever seriously disturbed this ratio of the densities. We quote the following few experiments in support of this statement.

Experiment 14.—The plate, a "Manchester Slow," having received three different exposures, was cut into four portions; two were developed with hydroquinone, and two with eikonogen for different lengths of time. The densities are given exclusive of fog, which, with both developers, was very considerable.

Developer.	Exposure C.M.S.	Short Develop.		Long Develop.		Ratio $\frac{D_2}{D_1}$.	Remarks.
		Density D_1.	Ratio	Density D_2.	Ratio.		
Hydroquinone.	Seconds.						Short time = 2·5 m.
	10	·485	1·0	·785	1·0	1·61	Long time = 7·5 m.
	20	·875	1·80	1·385	1·76	1·58	Mean ratio, 1·55.
	40	1·450	3·0	2·120	2·70	1·47	Greatest error, 1 per cent.
Eikonogen.							Short time = 4 m.
	10	·310	1·0	·580	1·0	1·87	Long time = 12 m.
	20	·560	1·81	·980	1·7	1·75	Mean ratio, 1·79.
	40	·905	2·92	1·600	2·76	1·76	Greatest error, 4·1 per cent.

Experiment 15 shows that the same result is obtained with pyrogallol development. Plate used: "Manchester Slow." Densities exclusive of fog.

Exposure.	Developed, 3 min. Ammonia added at once.		Developed, 18 min. Ammonia added in 6 doses every 3 min.		Ratio. $\frac{D_2}{D_1}$.	Remarks.
	Density D_1.	Ratio.	Density D_2.	Ratio.		
Seconds.						Mean ratio, 1·15.
10	·385	1·0	·420	1·0	1·09	
20	·770	2·0	·850	2·0	1·10	Greatest error, 5 per cent.
40	1·095	2·84	1·315	3·1	1·19	
80	1·455	3·7	1·765	4·0	1·21	

Experiment 16 is important because it contradicts emphatically the belief that gradations of an over-exposed negative can be altered by using greater amounts of bromide. Plate: "Manchester Slow."

Exposure.	Developed, 4 min. 100 c.c. = 0·22 NH_4Br.		Developed, 12 min. 100 c.c. = 0·66 g. NH_4Br.		Ratio $\frac{D_2}{D_1}$.	Remarks.
	Density D_1.	Ratio.	Density D_2.	Ratio.		
Seconds.						Mean ratio, 1·15.
10	·440	1·0	·485	1·0	1·10	
20	·840	1·91	·965	1·98	1·15	Greatest error, 1·3 per cent.
40	1·200	2·73	1·440	2·97	1·20	
80	1·625	3·70	1·900	3·90	1·16	

Experiment 17.—For this experiment a "Wratten Ordinary" plate received four different exposures. It was then cut into four portions, and each portion was developed with a different developer. The result is extremely interesting and important, since it shows that the ratio between the various densities is identically the same whatever developer is employed, except in the case of eikonogen, in which the ratios are a little different. We shall recur to this difference in another place.

* Continued from page 738.

Time of Development Different for each Developer.

Exposure.	Ferrous Oxalate		Pyrogallol.		Hydroquinone.		Eikonogen.	
	Density.	Ratio.	Density.	Ratio.	Density.	Ratio.	Density.	Ratio
C.M.S.								
10	·310	1·0	·320	1·0	·410	1·0	·300	1·0
20	·535	1·7	·550	1·7	·695	1·7	·470	1·6
40	·810	2·6	·805	2·5	1·000	2·4	·645	2·2
80	1·080	3·5	1·005	3·1	1·400	3·4	·820	2·7

These experiments all confirm the statement that the gradations of a negative, as expressed by the ratios of the densities, are independent of time of development, cannot be affected by alterations in the composition of the developers, and are almost identically the same whatever developer is employed. We are thus driven to the conclusion that the photographer has no control over the gradations of the negative, the ratios of the amount of silver deposited on the film being solely dependent upon the exposure. The photographer has the power to increase the total density by prolonged development, but by no means at his disposal can he alter the ratios existing between the amounts of silver reduced in the various parts of the negative; they are regulated entirely by the exposure. These ratios are not even altered by intensification after development, as is shown by the following results:—

INTENSIFICATION.

Experiment 11.—Plate, "Wratten Ordinary," exposed and developed with ferrous oxalate, measured, and afterwards intensified and measured again.

Exposure.	Before Intensification.		After Intensification.		$\frac{D_2}{D_1}$.
	Density D_1.	Ratio.	Density D_2.	Ratio.	
10	·31	1·0	·60	1·0	1·93
14	·50	1·61	·91	1·5	1·82
20·5	·67	2·16	1·30	2·16	1·94
29·3	·86	2·77	1·71	2·85	1·98
11·9	1·03	3·32	2·15	3·5	2·08
60	1·30	4·19	2·56	4·2	1·96
				Mean ...	1·95

It will be seen that the process of intensification has almost exactly doubled the amount of silver on the plate. Almost the same result was found in the following experiment:—

Experiment 19.—Similar to last experiment.

Exposure.	Before Intensification		After Intensification.		Ratio $\frac{D_2}{D_1}$.
	Density D_1.	Ratio.	Density D_2.	Ratio.	
10	·260	1·0	·475	1·0	1·82
20	·460	1·8	·850	1·8	1·85
40	·700	2·7	1·270	2·6	1·81
80	·950	3·6	1·700	3·6	1·79
				Mean ...	1·82

In this case intensification did not quite, but very nearly, double the amount of silver in each density, but the ratio existing between the several gradations is again not affected at all.

We see, therefore, that whatever may have been the mode of development employed, and whether intensified or not, the ratios of densities are characteristic of the action of the light, and can be alone relied on in investigations respecting the action of the light on the sensitive film.

REDUCTION.

There is only one process known to us, so far, which will totally alter the ratios existing between the deposits of silver on a negative, viz., the process of reduction, that process consisting in immersing the developed plate into a solution of potassium ferricyanide and sodium thiosulphate (hyposulphite). This process so alters the ratios, that photographers ought to use it very cautiously.

Experiment 20.—Plate exposed, measured, and reduced by immersion in potassium ferricyanide and sodium thiosulphate.

Exposure.	Before Reduction.		After Reduction.		Ratio $\frac{D_1}{D_2}$.
	Density D_1.	Ratio.	Density D_2.	Ratio.	
10	·410	1·0	·020	1·0	20·5
20	·655	1·6	·130	6·5	5·0
40	1·010	2·46	·365	18·2	2·7
80	1·450	3·5	·680	34·0	2·1

(To be continued).

FAST AND FUGITIVE DYE STUFFS.*

BY PROFESSOR J. J. HUMMEL.

Now, when we study the action of light in these various coal-tar colours, we find that, whereas the members of some groups are for the most part fugitive, the members of other groups are nearly all fast, and it becomes at once evident that the chemical constitution of a colouring matter exercises a profound influence upon its behaviour towards light. Those colouring matters in which the atomic arrangement is similar to that in magenta—*e.g.*, malachite green, methyl violet, victoria blue, &c.—are all similarly fugitive to light. On the other hand, those colouring matters which are closely allied to alizarin possess generally the quality of fastness to light. Members of the eosin group are, for the most part, extremely fugitive; those of the indulin group are comparatively fast. In the Azo group some are fast and others fugitive. It is scarcely necessary to say that the fastness to light of a colour is independent of its commercial value, this being mainly determined by the price of the raw material from which it is manufactured. Neither must we suppose that facility of application of a colouring matter necessarily interferes with its fastness to light, for as a matter of fact, some of the fastest coal-tar colours on wool, *e.g.*, tartrazin, are applied in the simplest possible manner.

On the other hand, the intensity of depth of a colour has more influence on its fastness. Dark, full shades invariably appear faster than pale ones from the same colouring matter, simply because of the larger body of pigment present, and the fading is, consequently, not so perceptible. A pale shade of even a very fast colour will fade with comparative rapidity, and it appears to me that the fugitive character of many of the coal-tar colours is rendered more marked because, owing to their intense colouring power, there is often such an infinitesimal amount of colouring matter on the dyed fibre. I would here ask everyone to get rid of the still prevalent popular idea that the modern coal-tar colours are all fugitive, while those of the older vegetable dye-stuffs are all fast. We have, as I have told you, fast and fugitive dyes in both classes. Of coal-tar colours we have at the present time about three hundred distinct kinds, of which about thirty give extremely fast colours, and an equal

* Continued from p. 712.

number or more give moderately fast colours. On the other hand, out of about the thirty natural dye-stuffs usually employed, we may count ten as giving fast colours. We have, therefore, a total of about three times as many fast coal-tar colours as we have of fast natural dye-stuffs.

This pitting of natural *versus* artificial colouring matters ought surely now to cease, when, through the researches of modern science, two such old and valued friends as madder and indigo have been shown to contain colouring matters also obtainable from coal-tar; and it is by no means improbable—indeed, it is very probable—that in time it will also become possible to prepare the colouring matters of logwood, Brazilwood, camwood, cochineal, and others from this protean wonder of modern times, coal-tar. Of course it is not to be denied that we have a very large number of fugitive coal-tar dyes, and the indiscriminate use of these, due largely to competition, has no doubt injured the reputation of the whole class. Not unfrequently one is asked if there is no method of rendering the fugitive colours fast? My answer is—no. The fast or fugitive character of a colour is an inherent property of the colouring matter used, and dependent mainly, if not entirely, upon its chemical constitution, as I have already said. What, then, can the dyer do to improve the fastness of his coal-tar colours? My answer again is, he must examine very thoroughly the characteristics of every colouring matter, then choose the fastest and reject the rest, or, at any rate, only employ them where they are perfectly admissible.

Such a process of selecting the fittest has gone on in the past with respect to the dye-woods, and such is the sifting process now at work even among the coal-tar colours. Side by side with this there must run the selection of the most brilliant and most easily applied of the fast colours, so that the ultimate goal of perfection to which we should thus attain would be to have all our colours fast, brilliant, and easily applied. I do not forget that many people abhor excessively bright colours, and the much maligned aniline dyes are considered on this account most unworthy of our attention; they jar the æsthetic taste, they are crude, and inartistic. No doubt this is perfectly true when they are used singly, and are inharmoniously arranged, but, given a good range of brilliant colours, it becomes possible, by their varied combination, to produce the most thoroughly pleasing and attractive shades of greys, and olives, and browns, and the thousand-and-one delicate tints beloved by the artist, and they yield, when desired, such as possess a richness and life and body of colour, compared with which the older colours are poor and lifeless.

Let the artist inexperienced, perchance, in the application and proper use of coal-tar colours, confine his attention, if he wishes, to the more sombre and older dye-stuffs, but do not allow him to persuade you that there is neither beauty nor permanence, nor other quality of excellence, in any of the coal-tar colours of to-day. Employ them aright with discretion, with intelligence, and they will not fail to recommend themselves to your better judgment. Rather than describe their discovery as useless, even from an artistic point of view, I would say, all honour to the founders of the coal-tar colour industry. If, in the beginning, he gave us the fugitive mauve, did he not afterwards labour hard and successfully in the cause of the fast artificial alizarin? All honour, then, I say, to Dr. Perkin, who has been instrumental in giving to the world not only fugitive, but fast coal-tar colours.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

BLISTERING ALBUMEN PAPER—WET ORTHOCHROMATIC PROCESS—DARK ROOM LIGHT—COMBINED HYDROQUINONE AND EIKONOGEN DEVELOPER—EIKONOGEN DEVELOPER FOR BROMIDE PRINTS.

Blistering Albumen Paper.—Complaints about blisters on albumenised paper have been numerous of late. The trouble may, however, in almost all cases be avoided by using the method of Mr. Rudolph, which I have recently described in these pages. Another good, though, I think, not quite new remedy, is given by Mr. B. Kröhnke in the last issue of *Liesegang's Photographische Archiv*. He suggests, not to place the prints, after removing them from the printing-frame, directly in water, but to soak them first thoroughly in a solution of 1 part of glycerine in 5 to 6 parts of water for at least five minutes; then to pour off the solution, and to wash well with water before toning them. The glycerine solution may be used over again; it is only necessary to add to it from time to time a small quantity of common salt (½ to 1 gramme to the sheet), in order to render the soluble silver contained in the paper insoluble. It will, perhaps, be more convenient to add to it from the very beginning, and once for all, 5 per cent. of common salt; the glycerine solution will then remain clear, and does not require to be filtered.

The "Wet" Orthochromatic Process.—Mr. Max Jaffé, proprietor of a photographic art printing and engraving establishment at Vienna, publishes in *Photographie* the orthochromatic process which is in practical use in his establishment, and which, as he says, is a modification of the process published in 1878 by Ducos du Hauron. The main points af this practical process are the following:—In 250 c.c. of alcohol of 95 per cent., 2·2 grammes of eosine are dissolved, then 45 grammes of cadmium bromide; the solution is filtered, and 250 c.c. of sulphuric ether added to it. The whole is, with repeated shaking, added to 1,000 c.c. of 2 per cent. plain collodion. The sensitising solution consists of—

Water	... 1,000 c.c.
Silver nitrate	... 165 grammes
Conc. nitric acid	... about 10 drops

The plates are allowed to remain in this solution until the film has acquired a good density, which will take about ten minutes. The plates being highly yellow-sensitive, yellow light must of course be avoided in the dark room. The exposure must be increased for about one half of that required in the case of ordinary wet collodion plates. After exposure the plate is directly developed with the following iron developer:—

Water	... 1,000 c.c.
Sulphate of iron	... 40 grammes
Alcohol...	... 30 c.c.
Sulphuric acid	... 12 drops

The image comes out quickly, the deposit being produced at the end of the development: it disappears if the plate is sufficiently rinsed; the plate is then, as usual, fixed in a concentrated solution of hypo, and then washed. The red tint of the film, owing to the eosine with which it has been stained, renders it difficult to judge whether the plates have been correctly exposed; it is therefore desirable to remove the red stain. This may be done at once by pouring over them water to which a few drops of hydrochloric acid have been added. The same end is, of course, attained by prolonged washing with plain water.

The plates treated by this method are specially sensitive to yellow and green; if the subject to be reproduced contains a good deal of blue, a yellow screen must be used. Deep red comes in the reproduction as dark as in the ordinary process; this may, however, be compensated for by intensifying the parts of the negative which are without the required density. Mr. Jaffé suggests to make use in such cases of very fine graphite (black-lead), which is applied to the weak parts of the negative by means of a leather stump. This method of local intensification may as well be employed in cases where there have been two different colours side by side in the original of equal luminosity, and which on the negative have been reproduced equal in tone, in order to produce a certain amount of contrast.

Dark Room Light.—Recent spectroscopic tests made by Professor H. W. Vogel have shown that few of the commercial dark room glasses are so safe as could be desired. Mr. E. Vogel therefore suggests that the safe ruby glasses, so difficult to obtain, should be replaced by coloured gelatine films, which cut off much less of the light of the flame, being, however, absolutely safe. He proceeds as follows:—1 gramme of aurantia is dissolved, by aid of heat, in 100 c.c. of distilled water. Unless the whole of the aurantia dissolves, a few drops of ammonia should be added. On the other hand, 20 grammes of gelatine are dissolved in 100 c.c. of water. Of the aurantia solution 25 c.c. are taken and mixed with 25 c.c. of the gelatine solution; the mixture is filtered through moistened flannel. With this coloured gelatine solution, thoroughly cleaned and perfectly levelled glass plates are coated, care being taken to avoid air-bubbles. About 30 c.c. of the above solution will be required for a plate of 18 by 20 centimetres. Mr. E. Vogel asserts that, thus prepared, plates completely absorb the blue light, and that they serve very well for dark rooms in which wet collodion or gelatino-chloride papers of low sensitiveness are developed. For the development of highly-sensitive gelatine plates and of orthochromatic plates they are, however, not suitable, since only the blue light is absorbed by them, the yellow, green, and red light passing through freely. For plates absorbing green and red, a red colour, called rhodamine, is recommended by Mr. Vogel; a concentrated solution of it absorbs yellow, green, and violet completely, whilst blue and red light passes through freely. The rhodamine films are prepared as follows:—8 grammes of rhodamine—manufactured by the Badische Anilin und Soda Fabriken, of Ludwigshafen—are dissolved in 250 c.c. of water; also 20 grammes of gelatine in 100 c.c. of water. Then 25 c.c. of the gelatine solution are mixed with 30 c.c. of the rhodamine solution, and the mixture is filtered through moistened flannel. For a glass plate of 18 by 20 centimetres, 50 c.c. of this mixture are taken. If a glass plate coated with rhodamine solution is combined with an aurantia glass plate, a screen is obtained which lets through the red light rays exclusively, and which may be used, therefore, for the development of ordinary gelatine plates. The two plates should be placed with the film sides together after drying, to protect them against injurious liquids. If the glass plates, before coating, are provided with a substratum of collodion, the gelatine films may be easily stripped off after drying, and employed for tourists' dark room lamps. It is said that also the ultra-violet light rays are entirely cut off by the above-described coloured-glass plates. As to the keeping qualities, it seems that the rhodamine films keep best. But also an aurantia glass screen has been used by Mr. Vogel for four weeks daily without showing any alteration.

Combined Hydroquinone and Eikonogen Developer.—In consideration of the fact that eikonogen, *per se*, tends to give flat negatives, though the energy of the developer is impaired, and that hydroquinone, *per se*, acts rather slowly, giving, however, great density, a combined hydroquinone and eikonogen developer is used and strongly recommended by a well-known amateur photographer. Its composition is the following:—

No. 1.

Sulphite of soda, cryst.	60 grammes
Cryst. soda	40 ,,
Distilled water	...1,000 c.c.

After solution to be filtered; keeps any time.

No. 2.

Eikonogen	50 grammes
Hydroquinone	50 ,,

Are placed together in a porcelain mortar, rubbed down to fine powder, and then kept dry for use in a well-stoppered glass bottle. For use, take 1 gramme of No. 2 and dissolve it in 100 c.c. of No. 1. The solution keeps well for several weeks. This developer is said to possess all the advantages of the hydroquinone, iron oxalate, and pyro developers, without their disadvantages. The greatest advantage, however, consists of the fact that the developer, if larger quantities are to be prepared, is always ready at hand, and that larger or smaller quantities may always be prepared without any delay.

Eikonogen Developer for Gelatino-Bromide Prints and Enlargements.—Dr. E. A. Just, of Vienna, recommends the following developer for prints and enlargements on gelatino-bromide paper:—

Sulphite of soda	32 grammes
Carbonate of soda, cryst.	24 ,,
Eikonogen	8 ,,
Distilled water	960 c.c.

Bromide of potassium may be added if required, from 1 to 10 drops, to 1,000 c.c. of the developer. It is recommended to use part freshly-prepared developer with some old added for each print as developed, this being preferable to a quite fresh solution.

Herr Siegsfeld, a German meteorologist, proposes to determine the temperature of the atmosphere at different heights by sending up at night small balloons, each carrying a thermometer and miniature camera, with a flash-light arrangement that may be discharged by electricity.—*The Beacon.*

Speaking of Automatic Machine Companies—the drop-a-nickel-in-the-slot and get your photograph—the *Financial Times* says: "The worst of these automatic companies is that they bear rather too close a resemblance to the machines they profess to work. When the coin has gone into the 'slot' it is next to impossible to get it back again."

Gum Picking in Trieste.—Among the working population of Trieste the "sessolotte"—or "shovellers"—form a distinct and easily recognizable class. These "sessolotte" are the girls employed in sorting and classifying gums, figs, dates, and other produce for which Trieste is an important market centre. They lift the goods out of the original packages by means of a "sessola," or small wooden scoop, and place a supply on a smaller wooden table made for the purpose. The "sessolotta" holds a knife in her right hand, and with this and the fingers of the left hand she is able to sort, in an incredibly short time, the gum or other material which she is told to pick according to size and quality. It is said that the natural gum arabic, as it arrives in Trieste, has to be picked twelve times in this manner before it is finally fit to be brought into commerce as finest hand-picked quality.

THE ABOLITION OF LONDON SMOKE.*

EXPERIMENTS on the question as to whether the illuminating power of gas suffers from travelling long distances, have been made in connection with the gas which travels from the extensive gas works at Beckton to London, and it has been found that its illuminating power is not appreciably affected. The gas from the Beckton gas works is supplied in unusually large quantity, and in a pipe 4ft. in diameter, nine miles long; and there are circumstances in its transit which materially tend to counteract any evil effects from the distance which the gas has to travel. In the first place, the great quantity helps to maintain the conducting pipe at a suitable temperature, thereby lessening the tendency towards undue condensation; and secondly, by lessening the amount of friction to which the gas is subjected. It has been thought also that the adverse influences of distance are fully balanced by the large diminution which occurs in the amount of aqueous vapour.

The capital which is authorised to be raised by the London and suburban gas companies amounts to £21,500,000. Of this about £17,000,000 are actually raised. Another £20,000,000 at least are invested in rolling stock, in railway sidings, wharves, coal waggons, horses, and fixtures by those interested in the coal supply. Thus, it will be seen that nearly £40,000,000 are now in use, invested in the business in one way or the other, apart from the enormous investments by railway companies in connection with the transit. Assuming that the present plan is adopted, I do not myself see any tangible reasons why sufficient capital could not be easily obtained to construct the new system. We have recently seen in the prodigious undertaking of the Manchester Ship Canal, how investors are ready to obtain fresh outlets for their accumulating sources of wealth; and it is notorious that whenever there are schemes which are of service and profit to the community afloat, there is little difficulty generally felt in obtaining the capital required to carry them out. The total income, less public lamp charges of the metropolitan and suburban companies in 1888, arising from gas rentals, meter and stove rentals, rent, and miscellaneous receipts, amounted to £5,087,942. The net profit of these companies in that year was about £1,600,000, and they paid about £210,000 in rates and taxes. This represents, of course, only the side of the question relating to the gas manufacture. It is difficult to arrive at the actual amount of profit obtained by the coal retailers, all of which would be saved by having London lit, heated, and worked by gaseous fuel. For the enormous amount of capital which is at present invested in gas works, in mains, in the undertakings of the London companies, and in the railway stock and gear which it is necessary to use, it would be exceedingly easy to reconstruct, on a scientific and satisfactory basis, the whole of the lighting and heating arrangements of the metropolis.

There remains one other consideration in this scheme which presents, I confess, most difficulty. It is the question of coal fields, where the gas is to be manufactured. The coal supplies of this country are supposed to be rapidly coming to an end; and it has been prognosticated that the day is not far distant when the supremacy of this country will be seriously affected by the termination of her coal resources. One result of adopting the plan of supplying London with gaseous fuel will be the great economy of coal, through its consumption not being required and reduced to a minimum in the metropolis. The estimates formed of our coal supplies are, however, probably too low, and we find, for instance, in South Wales, at the present time, fresh sources of coal supply being opened in many places. The coal field which is nearest to London will be that of North and South Staffordshire. The coal field which would probably be most useful to select would be either this district or that of South Wales. The only question would be that of additional expense for the laying down of main pipes, and, whilst recognising that as a serious item, one must also remember the corresponding advantages to be derived. I think that once this principle of removing gas manufactories to the more suitable locations of the coal fields is adopted, the difficulty of selecting the coal field will be easily overcome. The expense need not frighten us; the saving would, in the long run, be so enormous and far-reaching that the initial cost could not be prohibitory. The experiments which have be been tried at Manchester by removing mills into the country will be repeated here on an immense scale, and the ensuing benefits will be relatively enormous. Capital being easily procurable, there can be no reason why we should not do for London in gas what the enterprising Liverpool corporation have done for their town, in bringing the more difficult element of water from the wilds of North Wales.

* Continued from page 696.

In commencing this statement, I endeavoured to summarize before you the manifest inconveniences (or some of them) attendant upon our present system of coal consumption in the metropolitan area. I have also attempted to show you upon what lines the reform of that system should, in my opinion, be carried out. The confessed inability of our authorities in dealing with the serious questions before us is due to one great fact: they do not care to face the storm of criticism which must come upon the heads of those who interfere with branches of industry which have become settled sources of livelihood and remuneration. No remedy for fogs and for the winter miseries of our climate can ever be suggested which does not go to the root of the matter. Nothing can ever be done in alleviating the pains and penalties of our present system which does not leave the coal burning out of the question. Free from mist we can never be, but surely it is not too much to hope and to strive for freedom from that black canopy which so frequently deadens the life and lights of London, and which imposes such fearful burdens upon the community. Some amount of mist will, of course, be present under the best conditions, but it is quite possible to rid that mist from the pernicious ingredients resulting from the indiscriminate use of coal in our fires. Some maintain that fogs are good, inasmuch as some of the products of the combustion of coal in the air exercise an antiseptic and disinfecting influence; but, notwithstanding this slight and doubtful advantage, it is certain that whatever degree of purification of the air may be reached in our large towns, there will probably be enough left to exercise this questionable effect. What we have to get rid of is the smoke, which is the dangerous element in the comparatively innocuous mist. There seems no valid reason why our domestic fires should not be supplied by gas in the way which has already been indicated. During the past few years the marked improvement in gas stoves, ovens, heating apparatus, and open gas fires have been so great that we can be said to be only at the threshold of its development as a heating agent. This is the only method by which we can secure smokeless chimneys, and these smokeless fires and economical grates would do away with the present smoke. The advantages of gas fires and stoves are now thoroughly established, and have been well set forth and illustrated by Dr. Carpenter, Mr Fletcher (of Warrington), and others. It only requires inspection of some of the various modern gas stoves in use to prove that they are in every way as pleasant, cheerful, and comfortable as the present dirty fires.

By this means the products and equivalent of coal for heating and lighting purposes would be brought to London at a cost of about one-tenth of the present expense of transit.

By the plan suggested an immense amount would be saved, even in the price of gas itself. It would be safe to say that gas could be reduced to one-half of its present cost, and thus we would have a cheaper, a cleaner, and an efficient mode of heating and lighting hitherto denied to us. There would be the saving in health and comfort, in public resources, the economy of precious time and money. We should have a cloudless sky and a healthy atmosphere, and should stand a better chance of perceiving the rays of the sun than at present. There would be the prolongation of life and the incalculable additions to comfort and ease. Beyond these also we could obtain for the poorer classes benefits of a kind which they would appreciate directly. We could procure a more sanitary and cleanly state of affairs in their homes, and this is no small gain when their normal condition at present is considered. We boast of our wealth, our science, freedom, our

powers of combined exertion, our sense of cleanliness ; we glory in our civilization, but our glory becomes a shame if the present wasteful system is continued.

Even if it were necessary that a vast stock of unused capital should be expended to bring about the reform, I think that it would not be money ill-spent. Not that I agree for a moment that the present capital would be destroyed. It would only be diverted into new channels, just as when gas was first introduced into this country, and when towns were illuminated first by gas, the old musket barrels, laid by in quiet retirement after the fatigues of the great Continental wars, were employed for the conveyance of the gas in lieu of pipes ; and, by a remarkable coincidence, various iron-founders desisted in a great measure from the manufacture of iron ordnance and took up the peaceful employment of casting pipes for gas and water. There would be on the asset side the priceless boon of a healthier and more comfortable people. Besides that we could point to the saving of at least £6,000,000 per year in carriage and distribution and domestic labour, putting aside the question of depreciation of property. If we could total up the fairest estimate of the approximate money waste occasioned by London fogs in the course of a single year, it would be expressed, no doubt, in terms of millions sterling ; and no plan should be set aside without due and reasonable consideration if it presents some practical scheme of reform. The question of expense, of the raising of capital, is in reality not the most formidable. The existing prejudices, the national sentiments of English people in favour of the present English fire, are stronger obstacles to a thorough eradication of the smoke evil than the obtaining of the necessary capital. One does not see why the cheerful fire will not be perpetuated in the equally cheerful, the far more convenient and cleanly gas fire which would be introduced in the new era. Something must be done, and I am certain that when it comes to be done it will be found in the direction which I have endeavoured to point out in this letter.

58, *Lady Margaret Road, London, N. W.*

Patent Intelligence.

Applications for Letters Patent.

14,505. George Walter Marx, 6, King Street, Cheapside, "Improvements in Retouching Desks for Photographic Artists and others."—Sept. 15th.

14,636. William Robert Lake, 45, Southampton Buildings, London, "Improvements in and Relating to Photographic Cameras." (M. A. Seed Dry Plate Company, United States). —Sept. 16th.

14,681. Thomas Augustus Kennedy, 15, Water Street, Liverpool, "Improvements Connected with Photography."—Sept. 17th.

14,882. Walter Henry Evans, 54, Fleet Street, London, "Improvements in Portable Apparatus for Use when Developing Photographic Plates."—Sept. 20th.

Photographic Club. — The subject for discussion on October 1st will be "Printing Clouds in Lantern Slides ;" October 8th, "Flash Lamps."

Aluminium.—The following sanguine reference to a new process for producing this metal we clip from an American journal :—"Photographers and all who handle optical apparatus will be glad to hear that cheap aluminium is now an accomplished fact : a chemist in this city—Chicago—having discovered a method by which it can be produced at less than fifteen cents (sevenpence halfpenny) per pound. It may be made as soft as copper or as hard as steel, and is likely to revolutionise the metallic industries of the country, as everything that is now made of iron in one or other of its forms may be made of the cheapened aluminium. The process has passed the experimental stage, and a company has been formed and a large factory is in course of erection. In the meantime the company will not supply the metal, but only articles manufactured therefrom ; but of course that arrangement will only be temporary."

Correspondence.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

Sir,—It may be of interest to hon. secretaries of the photographic societies of the U. K. who are making their arrangements for lantern exhibitions during the coming winter to know that the Boston Camera Club (U. S. A.) are sending us another lecture entitled "In and about Columbus," to be here about end of this month. This is a gift to the Amateur Photographic Society of England by the Columbus Camera Club, on the same general terms as "Illustrated Boston." and "The White Mountains of New Hampshire."

There will then be three sets of lantern slides of about eighty each, with accompanying lecture neatly mounted in type, of American scenery in free circulation in this country, and which can be loaned to any society on application to me.

G. M. Tunstall, hon. sec.

Liverpool Amateur Photographic Society, September 20th.

GLOUCESTERSHIRE PHOTOGRAPHIC SOCIETY.

Sir,—The date being now fixed for our triennial Exhibition, we shall feel obliged if you will kindly announce the same.

The conditions and schedule of awards have been revised, and are now more in accordance with prevailing opinions than the one issued in 1888, although that exhibition proved a success in every way, with its 140 exhibitors, and upwards of 600 frames, besides a large show of apparatus. We hope as before to secure the support of leading amateurs and professionals. The Exhibition will open Wednesday, April 17th, and close on Saturday, April 27th, 1891.

A. H. Clinch, F. H. Burr. } *Hon. Secs.*

P.S.—Prospectus will shortly be issued, and duly advertised.

Proceedings of Societies.

The London and Provincial Photographic Association.

September 18th.—Mr. F. P. Cembrano in the chair.

Mr. A. Cowan spoke of the advantage gained by using spectacle lenses in conjunction with other lenses, when an alteration of focal length was required. He exhibited several prints from negatives taken with a 7½ inch focus lens, with and without the combination of the spectacle lens, showing alteration of size of image. The additional lens should be used as close to the stop as possible, preferably behind it, and if of the meniscus form the convex side should be nearest the back lens.

The Chairman had tried a combination of this kind, but had not succeeded in obtaining such good results, with additional lenses, as a lens of the same normal length would give of itself.

Mr. T. E. Freshwater exhibited a series of micrographs of sections of some chalk formations ; the prints showed very fine detail.

The subject down for discussion was the powder process, which was opened by Mr. A. Cowan, who exhibited a specimen of the process on smooth opal.

Mr. Cowan proceeded to explained the rationale of the process. A tacky organic substance to which potassium dichromate has been added is allowed to dry ; if it is exposed under a negative, it will take different degrees of tackiness according to the intensity of the light acting upon it, a fine powder dusted over the surface adhering to it in proportion to the tackiness. To prepare a plate, it must be absolutely clean ; it is then coated with collodion, and allowed to set. A second coating is given of the formula selected. Mr. Cowan used dextrine, glucose, dichromate potassium, glycerine, and water, modifying the proportions according to the moisture of the atmosphere. After exposure the powder can be applied with a flat brush. He considered it the best of the carbon processes.

Mr. A. Haddon had tried the process, using five to six drops of glycerine to each ounce solution. By omitting the glycerine

be obtained finer high lights. He had used the process in making photo-enamels. Two specimens were handed round. In order to obtain a positive picture a reversed positive must be used. Mr. Haddon, after dusting, reversed the film after floating it off the glass support.

Mr. A. MACKIE considered the powder process might be used with advantage to intensify negatives.

The opening night of the lantern season was fixed for Thursday, 9th of October.

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

A MEETING was held at 76, Peckham Rye, on Friday, September 19th, with the PRESIDENT of the Society in the chair. Five new members were elected.

Mr. F. W. HART gave a demonstration in flash-light photography. He brought with him specimens of his various patented lamps, and also of his stands for screens, &c. The demonstrator practically showed the method of using flash-light in the studio, and handed round a large number of specimens of work done by his apparatus. Shortly after the introduction of his lamps, Mr. Hart found the necessity of properly adapted supports for them, and soon contrived, by the aid of light rods, to get to the desired end. He further extended their usefulness by means of the necessary connections, and they are now easily adaptable as supports for lantern screens, and also make an excellent open air studio, with the addition of a few curtains.

Mr. RANSON brought before the members a "New Folding Copying Apparatus," which is adapted for either copying, enlarging, or reduction.

The above business brought the meetings at 76, Peckham Rye, to a termination. The future meetings of the Society will be held at Hanover Hall, Rye Lane, S.E., the first of which will be a lantern night, on Friday, October 3rd. Amateurs wishing to attend can do so by first communicating with the Hon. Sec., S. W. Gardner, 7, Barry Road, East Dulwich, S.E.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

AT a meeting held at 4, Great James Street, Bedford Row, London, on 17th September, Mr. T. E. FRESHWATER in the chair, two applications for assistance were made, and one application was granted, the other being adjourned.

A letter from Mr. W. S. Bird (Chairman of the Executive Committee of the Photographic Section of the London Chamber of Commerce) was read, enclosing 30s., being an outstanding item of the Drapers' Hall Exhibition.

A sub-committee of this Association was appointed to confer with the Photographic Club for carrying out the proposed concert and lantern show to be given by the Club.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

ON Thursday the 18th, the first and last out-door meeting of the season was held at Gilsland, Lanercost, and Naworth, under very favourable meteorological conditions. Fourteen cameras, ranging from 12 by 10 to stereo and quarter-plate, were in active operation all day, the net result being 113 exposures Driving to Bird Oswald, the Roman camp was the first object to receive attention. The next point of interest was Coombe Crag, a beautifully wooded stretch of the river Irthing, where a couple of hours were spent, numerous exposures made, and considerable amusement created by the misadventures which befel some of the party. Proceeding to Lanercost Priory, a splendid old pile possessing great attractions to those who care for architecture, cameras were soon again in operation, and exterior and interior views obtained in profusion. The beautifully wooded grounds of Naworth followed, and pretty bits were quickly secured, and views of the castle, court-yard, and a fine old tower were obtained. Before starting upon the homeward journey a group of the members was taken by Mr. Auty.

POISONING BY BROMIDE OF ETHYL.—Three cases of poisoning by bromide of ethyl have recently occurred in Berlin, two proving fatal. The dose in each case was only about twenty grammes (310 grains).

Answers to Correspondents.

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

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

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

S. H.—*Reviving Faded Photographs.* A treatment with bichloride of mercury is said to restore the faded impression, but of this we have no experience. The method of development with gallo-nitrate of silver is likewise doubtful. The best plan is to reproduce the faded photographs by the collodio-chloride process, as was done by the late H. Baden Pritchard in the case of the Crimean series in the possession of the War Office authorities. For working details, see the *Photographic Journal* of December, 1870, no camera being required.

OUT OF FOCUS.—*Camera Adjustment.* A bellows camera which has long been kept closed up will often, when first extended, have a tendency to run back again to a shorter focus. To overcome this defect a clamping screw is required, or a wooden wedge may be used, driven just in front of the pinion. High wind from the rear will sometimes push the carrier forward.

T. F.—*Carte Mounts.* Further samples received, which shall have our immediate attention. Meanwhile, the first batch has been returned to us through the post: all shall be examined together.

S. HIGHLEY.—*A Communication.* Duly received, and you shall have an early reply.

AMATEUR.—*Primuline Photographs.* If you refer again to the details printed on page 707 of the NEWS, and the leading article explanatory of the process on page 701, you will see that the treatment with nitrite of soda and acetic acid is necessary to diazotise the primuline before exposure to light. As we stated at the Leeds meeting, the process answers equally well on paper, fabrics, and coloured layers of gelatine.

L. E.—*Bromides in Emulsion.* It is almost a matter of indifference whether the potassium or ammonium bromide is employed, but the first-named salt is generally preferred on account of its more definite constitution. A small addition of iodide has been recommended by Capt. Abney and others, but this will depend on the purpose for which the plates are required.

M. T.—*The Price of Silver.* With the advance in the price of standard silver, the quotation for nitrate must necessarily go up. This ought to be partly compensated by your residues becoming of increased value.

A. S. F.—*Stripping Films.* It is true that with stripping films there is very slight tendency to halation and reversal of image: we have just seen some negatives that had received three or four times the normal exposure, and as regards gradation and brilliancy, leave nothing to be desired.

P. D.—*Sea Gulls.* These birds will often fly in the wake of a ship, expecting to be fed, remaining poised on the wing, and keeping pace with the vessel in such a manner as to be easily photographed.

WIDE-ANGLE.—*Examinations in Photography.* The City and Guilds of London Institute holds annual examinations in May at the Finsbury Technical College and at certain provincial centres, particulars of which can be learned from the secretaries. A small fee is demanded, and certificates and medals are granted for proficiency. It is not necessary to enter for training at the said Institution, and, as it is a written examination, the questions bear upon the scientific side of photography more than the practical.

THE COMING YEAR-BOOK.—We must respectfully request the friends who are thinking of sending us literary contributions for the above, to do so with the least possible delay. We have already stated that it is our wish to place the Annual in the hands of the public at an earlier date, if possible, than has been customary.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1674.—*October* 3, 1890.

CONTENTS.

POETRY AND ARTISTIC PHOTOGRAPHY.

WITHIN the last two or three years a revival has taken place in that "school" of photography which is largely represented in the present Photographic Exhibition, and which holds that photographs sharp-all-over are inartistic; in addition, it sometimes calls its opponents of another school "sharpists." The latter persons hold that photographs out of focus are bad photographs, that the contemplation of such pictures makes them feel ill-all-over, and that a photograph which gives pain to the observer must be a specimen of bad art. So the war wages, and it wages the more hotly because no universally recognised authorities or rules exist to settle the point at issue, which is one more of individual taste and individual psychical impressions than one which can be decided by any tribunal.

For the representation in artistic form of real and ideal subjects, poetry analogically stands upon much the same foundation as photography and painting. Does the best poetry teem with the rendering of minute detail, or is most of the detail left to the imagination of the observer? Let us, in the first instance, give an example from Congreve:—

ALMERIA.

It was a fancy'd noise; for all is hush'd.

LENORA.

It bore the accent of a human voice.

ALMERIA.

It was thy fear, or else some transient wind
Whistling thro' hollows of this vaulted isle;
We'll listen——

LENORA.

Hark!

ALMERIA.

No, all is hush'd and still as death—'Tis dreadful!
How reverend is the face of this tall pile
Whose ancient pillars rear their marble heads,
To bear aloft its arch'd and ponderous roof,
By its own weight made steadfast and immovable,
Looking tranquility! It strikes an awe
And terror on my aching sight: the tombs
And monumental caves of death look cold,
And shoot a chillness to my trembling heart.
Give me thy hand, and let me hear thy voice;
Nay, quickly speak to me, and let me hear
Thy voice—my own affrights me with its echoes.

Here it is evident that any rendering of minute detail, that any close description of the columns and of the building, would spoil the artistic effect. As the lines stand they excite the imagination, they convey the idea of the presence of some indefinable danger; they work upon that fear of the unknown from which few are free, so that the general effect is impressive.

Here, again, from the Koran is an utterance of Mohammed, truly poetical, and largely so from the play it allows to the imagination because not weighted by petty detail.

As the darkness over a deep sea, billows riding upon billows below, and clouds above; one darkness on another darkness; when a man stretcheth forth his hand he is far from seeing it; he to whom God doth not grant light, no light at all hath he.

Another specimen yet may be given in which great thoughts well up from the depths of man's inner nature, some of them indistinctly, others flashing more clearly, the whole yielding a truly poetical effect:—

An amber heaven fades to faintest grey;
Sky stoops to sea, sea rises grey to sky,
Wave rolls on wave for ever, sigh on sigh—
The death of day.

Art thou, too, dead?
The sea that rolls between, is that Death's sea?
May no hands touch, no solemn echoes fall,
None answering cry if one to other call,
From land or sea?

* * * *

Living or dead
Star-eyed and pale, thy face seems ever near:
Remembering love in life, one hour, one day,
Call once from out the dark, then turn away—
One heart may hear.

Hast thou not heard
Passionate moan of waves that break in tears,
Break on, and die, and still may not forget
The infinite perfection of regret—
These weary years.

Are we, then, to conclude that in all the best poetry much should be left to the imagination of the recipient? Not necessarily. Moreover, some recipients have no imagination. Here is a portion of a poem consisting entirely of clearly cut description of minute details,

yet the general result is artistie and highly impressive :—

"She is dead!" they said to him. "Come away,
Kiss her and leave her, thy love is clay!"
They smoothed her tresses of dark brown hair,
On her forehead of stone they laid it fair;
Over her eyes, which gazed too much,
They drew the lids with a gentle touch;
With a tender touch they closed up well
The sweet thin lips that had secrets to tell:
About her brow and beautiful face,
They tied her veil and her marriage lace;
And drew on her feet her white silk shoes,
Which were the whitest no eye could choose.
Over her bosom they crossed her hands—
"Come away," they said, "God understands!"
And there was silence, and nothing there
But silence and scents of eglantère,
And jessamine, roses, rosemary;
And they said, "As a lady should lie lies she."
And they held their breath as they left the room,
With a shuddering glance at its stillness and gloom.

To attempt to deeide what is the highest form of art in photography is as futile as to attempt to deeide what is the true ereed among those promulgated by different churehes. The eonsideration of ereedal questions sometimes brings to the front magnifieent specimens of intolerance and bigotry who would eonsign all their opponents to fire and faggot if they had the power. In eonnection with sueh subjeets the feelings are aroused, and all ideas of charity or respeet for the opinions of others sometimes thrown to the winds; henee the debates are hot, and eonverts from one side to the other few and far between. The saying that "What is one man's meat is another man's poison," is true also in relation to the appreeiation of alleged artistie productions in photography. Any photographie sehool whieh elaims that it possesses all truth in relation to art, and its opponents none, stands condemned, to a large extent, by its own intoleranee and its elaim to infallibility.

THE OPTICAL LANTERN AS IT WAS.

The approaeh of dark evenings reminds us that the time is at hand when the tourist photographer is thinking of packing up his traps for the winter. But the enthusiast will refuse to remain idle, for he knows that mueh remains for him to do, even at a season when the sun will not give enough of his light and heat to make out-door work either possible or agreeable. Negatives ean be reviewed, arranged, and stored; some ean be set aside for enlarging, aud we may feel certain that a very large proportion of them will be devoted to the making of lantern pictures.

We often hear it stated that the introduetion of the gelatine dry plate has done so much to popularise the art of photography by ereating a new race of amateurs, who could never have existed if the dirty wet plate process had not been dethroned. It is equally true that the popularity of the optieal lantern has inereased to a wonderful degree. By the aid of photography, the lantern had already been ehanged from a mere toy into a most potent aid to education, and few, perhaps, of the younger members of the eraft are aware how mueh the reeent growth and rapid improvement of the instrument are due to the applieation of dry plates to lantern slide making, more espeeially sinee manufacturers have produced a reliable lantern slide plate whieh is easy to use, and most effective when finished.

Under such eonditions, it is not a matter for surprise that the optieal lantern itself should have been the subject of many improvements, but it is diffieult to appreciate their value until we eompare the modern instrument with its predecessor. We have already, in these pages, dealt with the origin and early history of the lantern in the hands of Kircher and others, and we know well enough that these old-time experimenters, groping their way through no end of diffieulties, did wonders eonsidering the times in which they lived. But, in order to appreeiate the marked improvements whieh have taken plaee within the last few deeades, we must go baek not quite so far.

We have before us a book which bears date 1850, and whieh has for its title, "Companion to the Phantasmagorial Lantern." We may point out, in passing, that the "phantasmagorial" lantern differed from the ordinary magie lantern in being movable. It was worked behind a transparent sheet, and gradually approaehed to or reeeded from that sereen, so that the projeeted image —usually a skeleton or terrible monster —became smaller or larger as desired. Considering that the year of publieation was the one before that which saw the opening of the Great Exhibition in Hyde Park, when the wonderful perfection whieh several of the arts had attained was demonstrated, we must eonfess that optical seienee, as evideneed by the lanterns then in use, eould not have formed the subjeet of eareful experiment, or even study. Turning over the pages of this book, we first have an engraving of what is called the "eommon magic lantern," and a single glanee at it is suffieient to comfort us with the reflcetion that it is eommon no longer. Its eondensing lens—a single one—is fashioned after the pattern of the policeman's "bull's-eye," and its objective has the sweet simplicity of the double eonvex lens. Its lamp is an oil one, with a round wiek, the illuminating power of whieh would be far below a standard eandle. As a step forward, we turn to the next pattern shown. In this the eondenser consists of two double eonvex lenses, whilst the objeetive possesses exaetly the same elements, but of smaller size. The latter is set in a sliding foeussing tube, but without the vanity of a raek and pinion adjustment. This seeond lantern is furnished with an argand lamp, so that the projeeted image must have been far better illuminated than in the former case.

But the maker seems to have exhausted all his ingenuity in his "most improved phantasmagorial and mieroseopie lantern." Here we have an instrument that elearly has a double duty, for it can either be moved behind a sereen to produee the wonders of romanee, or it ean be employed to projeet the wonders of nature. There is a slight improvement in the

optical arrangements. The condenser remains the same as in the last case, but the objective consists of a pair of plano-convex lenses with a fixed diaphragm in front of them. The microscope attachment does not, strange to say, screw into the same flange as that provided for the lantern objective—as would be the case in a modern instrument—but projects behind the lantern, so that to use it the operator would have to move the instrument completely round.

Under the best conditions, such apparatus as that described could make but a poor show, and the inflated description of what it could do—quoted in this book from a contemporary journal—is certainly amusing. We read of "a soul-appalling spectacle to those who have hitherto been ignorant of the wonders of light and shade;" of "a ghastly spectre, its eyes moving agonizedly from side to side, or now turned up in the sunken eye-socket, the image of unutterable despair," &c., &c. We much fear that the prosaic boys and girls of the present day would feel more inclined to laugh, and perhaps chaff, at such a "soul-appalling" spectacle, than they would to feel frightened. We must thank photography for conferring upon such exhibitions reality in lieu of romance, and for substituting truth for falsehood.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Exhibition of the Photographic Society may be looked upon as a record of the year's progress. One naturally looks round for some novelty, which, though it may not be startling, will yet be significant of original thought and treatment. It does not necessarily follow that the novelty may be a step in advance; if it leads to reflection, and if it be out of the beaten track, it is welcome. There is distinct evidence of a new school of art photography in the present Exhibition, and yet it is not new save in this respect, that the peculiarities in which the late Mrs. Cameron won fame in portraits have been transferred to landscape, plus far greater manipulatory and technical skill. Later on it will be necessary to discuss in detail this revival; it will suffice for the present that the exponents of the new school, Mr. G. Davison and Mr. Lyonel Clark, have the courage of their opinions, and have exhibited pictures which, if they do not call forth universal admiration, will at least stimulate thought and discussion.

After the novelties come the medal pictures. It would be exaggeration to say that the pictures to which medals have been awarded stand out prominently from the rest. This, perhaps, is due to the fact that the Exhibition is of uniform and slightly monotonous excellence. In one point there is an absolute agreement, namely, the entire abandonment of silver printing, with its warm tones, and the adoption of platinotype or bromide prints, more or less cold in hue. It may be that to this fact is due to some extent the apparent lack of superiority in the medal pictures. There was certainly more variety in the old style. Its brilliancy and warmth of colouring in some respects, probably, unconsciously affected the awarding of prizes. Now we get an uniformity of tone, and the judges fall back upon purely artistic qualities. This, no doubt, is as it should be, but on questions of art individual thought steps in, and therefore the unanimous confirmation of the judges' opinion is not to be expected. The peculiar characteristic of the present Exhibition is, that while the medal pictures do not extort the admiration of former years, it would be difficult to say in what respect the judges have erred. Hence the conclusion is confirmed that the general standard of excellence is higher.

Taking the medals in the order of the catalogue, the merits of the new school are recognised by the awarding of a medal to Mr. George Davison for his picture (No. 55), "An Old Farmstead." The effect of this picture is exceedingly pleasing to the eye, and if it be that the quality of a photograph is that it should look as unlike a photograph as possible, then Mr. Davison has succeeded admirably. The composition is well balanced, the light and shade are arranged on what are recognised to be art principles; but the defect—if it be a defect—is that it does not suggest nature. It is not very clear what the mass of growth in the foreground is intended to be. Probably onions run to seed would be the nearest approach to what Mr. Davison has given us in his picture; but it may not matter. The new school possibly goes in for suggestiveness, and if the field of stalks with the knobs at the ends suggests the onion plant, then the object of the picture is answered. It would seem that such photographs as "The Old Farmstead," and others which will be noticed in their turn, can scarcely be criticised on the principles which have hitherto governed photographic art criticism; and it may be necessary to wait until further examples familiarise one with the intentions of the exponents of the new style.

Mr. Lyddell Sawyer is one of the most painstaking and conscientious of modern workers; it is always pleasant to be able to praise him—an opportunity, by-the-way, which one has pretty often. It is, however, by no means so certain that the picture (No. 122) which has gained the medal is the best one he has exhibited. The pictures of shipping on the Tyne will appear, to some tastes, to be more meritorious. However, the judges have decided in favour of his picture entitled "Two's Company," and, as a piece of photographic work, there is nothing to say against their judgment. Mr. Sawyer, however, is apt to fall into the error which mars so many photographs which pretend to tell a story: he essays too much. There is so much which invites criticism when the camera attempts the imaginative, that the simpler the idea, and the less said about it, the better. In Mr. Sawyer's picture, "Two's Company," we get a laughing damsel engaged in a very hot flirtation with a laughing swain, whose pose, by-the-way, is a little bit too energetic to carry out the idea to the best advantage. Further away is a second swain with an intolerable scowl upon his good-looking face. It is not quite clear as to what station of life the three belong—we make bold to say, in itself an oversight—but let this pass; the fault of the picture seems to be the presence of the third party. He occupies the most prominent position in the picture; he attracts the eye, and he is the jarring note, if not in the composition, at least in the idea. Mr. Sawyer, it is to be feared, sacrifices too much to his title. The title of a picture is of not much consequence, providing the story is told with clearness. Having got the idea of "Two's Company," he carries it out to the bitter end; in a word, the picture lacks that which is the aim of the new school—namely, suggestiveness. If a picture leaves nothing to the imagination, then one soon tires of it. Has not Mr. Sawyer made his *de trop* personage far too prominent?

Coming to the next medal picture in the catalogue (No. 165), "The Latest News," by Mr. J. B. B. Wellington, it would be interesting to know what is the special quality the judges have discovered entitling it to distinction. No doubt it fully deserves a medal, but one asks for information. The two girls in the picture, whose heads are in deep shadow, are certainly not prepossessing, and the old man with the stick may be interested about what one of the girls is reading, or may not; it is hard to determine. There is no especial effect as to lighting, nor have there been any extraordinary technical difficulties to over-come. Still, it may be fully entitled to the medal which has been assigned to it.

Mr. Shapoor N. Bhedwar has given us something new in his series of pictures, which are all illustrative of the "Feast of Roses." The medal has been assigned to No. 185, entitled "Hanging the Garland." A few words of explanation, either attached to each picture, or inserted in the catalogue, would make the pictures a little more intelligible to the general public. Mr. Bhedwar's style is that of delicacy and detail. It is to be wished, however, that his models were not so limp and inanimate. The strong point of such subjects as Mr. Bhedwar has chosen should be the arrangement of drapery. It can scarcely be said that Mr. Bhedwar has been altogether successful in this respect. The drapery, it may be said, should follow, or at least suggest, the lines of the human form, but Mr. Bhedwar's drapery will not altogether satisfy the eye nor the taste in this respect. Yet his pictures in many respects are praiseworthy, and as they are by themselves in one particular line, no one will grudge them the medal they have gained.

It is pleasant to come across a photographer who has a distinct style of his own. Most artists of eminence, whether painters or photographers, unconsciously put their individuality into their work, and style—or "mannerism," as some ill-natured people choose to call it—is the outcome. Mr. John E. Austin's work is, in this respect, very strongly marked, and in all his pictures he infuses a tenderness and feeling which are too often absent from photographs. To his photograph, "The Love Letter" (No. 221), a medal has been very properly awarded. It represents a group of three fisher-girls in the shadow of a boat. One is reading the love letter; the other two are listening. The picture is really a very pretty one in general arrangement, in the grouping of the figures, and in its technical qualities. It has also the merit of being unmistakably photographic. Whether a fisher girl is likely to receive a love letter may be doubted, but to object to the picture on this score would be hypercritical, and therefore let it remain.

Mr. Lyonel Clark has been awarded a medal for his picture "Dedham Bridge" (No. 232). How much of the effect is due to the rough grained paper on which it is printed it would be difficult to say. "Dedham Bridge" is an example of the new school, and no doubt an admirable one too. It is, however, a matter of opinion whether it is a school to be encouraged, as imitators are sure to spring up, and it may be in photography, as in painting, that while a Whistler can be tolerated, his imitators are intolerable.

Mr. R. H. Lord's "Study of Two Children" (No. 330), which has gained a medal, is very praiseworthy, but fails to extort enthusiasm. The truth is, the Exhibition is exceedingly weak in the matter of portraiture and figure subjects, and Mr. Lord's work stands out in the absence of competitors.

Mr. Ralph Robinson is as indefatigable as ever, and not a word could be said against his picture of "The Pedlar" (No. 332), if he had only secured models a little more prepossessing. The pedlar himself fulfils his duty admirably, but why is he surrounded by such plain customers? The whole charm of such a picture should consist in girlish beauty, but not a trace of beauty has Mr. Robinson permitted one to have. This a great pity. However, the absence of feminine attraction has not prevented the judges conferring a medal.

Mr. B. Gay Wilkinson, jun., has sent a number of specimens of his very careful work, and to one of these, "Sand Dunes" (No. 365), a medal has been given. It is to be presumed that Mr. Wilkinson's careful manipulation has earned this honour. The picture, which is without fault photographically speaking, is, considered as a picture, somewhat tame and uninteresting.

Mr. Harry Tolley is not quite so happy in the choice of subjects as on previous occasions. Still, it was impossible to overlook the claims of his "Bantry Bay" (No. 399), which, as an example of delicate treatment and distant effect, deserves high praise. Its defect is that it lacks interest. This, perhaps, arises from the subject, rather than from Mr. Tolley's treatment of it.

The most notable picture in the Exhibition is one which, perhaps, will have to be sought out. No. 600 is on one of the screens, and is by Mr. Van der Weyde. It is by no means so certain that its merits will be recognised by the general public, but photographers who know the difficulties of grouping will admire the consummate skill which is apparent in "An Invitation to Supper." The picture is made up of prints from three negatives, and represents a procession of ladies and gentlemen in court costume of the Georgian era. Notwithstanding the fact that the photograph is of a composite nature, the effect is thoroughly harmonious, and the pose of each couple in perfect consonance with the initial idea. There is not a false note struck in the whole composition, and Mr. Van der Wyde is to be congratulated, not only on the subtle skill which has enabled him to produce the picture, but on the fact that the judges have recognised its merits by awarding it a medal.

WIDE-ANGLE.

THE Fry Manufacturing Company offer to send post free to applicants a sample packet of their materials for trial. With each packet is enclosed a pattern negative, as a sample of the results that may be obtained with the plates, as also of bromide print and bromide opal.

ALUMINIUM.—A Chicago chemist, says the *Optical Magic Lantern Journal*—which, by the way, appears this month with an increased number of pages—claims to have discovered a method whereby aluminium may be produced for a few coppers per pound. A company has been formed for supplying various articles, including optical instruments, made of this metal.

CAMERA CLUB NOTICES.—Monday, October 6th, 8 p.m., Opening of the sixth of the series of One Man Exhibitions (pictures by Mr. Lyd. Sawyer); at 8.30 p.m., Smoking Concert. Thursday, October 9th, 8.30 p.m., First technical meeting of the session—Paper by the President, Capt. Abney, C.B., R.E., D.C.L., F.R.S. Thursday, October 16th, 8.30 p.m., Paper by Mr. Lyonel Clark, "Further Notes on Silver Printing." Thursday, October 23rd, 8.30 p.m., Paper by Mr. E. J. Humphrey. Thursday, October 30th, 8.30 p.m., Lantern evening. Monday, November 3rd, 8.30 p.m., Smoking Concert. Thursday, November 6th, 8.30 p.m., Mr. J. Gale, "Country Rambles with a Camera," illustrated.

THE FRENCH METRIC SYSTEM.

BY THE REV. H. GORDON PALMER, B.A.

It can hardly be gainsaid that our most distinguished astronomers and scientists are opposed to our adoption of the pseudo-scientific metre as a standard for weights and measures.

They urge, with convincing arguments, that this outcome of revolutionists of France, legalised in 1802, is not scientific at all; that it is not what their academicians professed it should have been; that, as a standard, it is, by almost impossible conditions of pressure and temperature, rendered practically useless for reference and comparison; that it is unnatural and cumbrous. Fancy a British carpenter or mason going to his work with a rule 39 inches and decimals, in his workmanlike hands, or projecting to the roof out of his trowser pocket! It has been well said, *apropos*, that no power on earth will make the British workman give up his handy two-foot rule.

The adoption of this metric system would involve enormous expense and taxation—on new sacks alone of several millions. Mr. Gladstone warded off this danger in 1853, and because it seems again "within measurable distance," I venture to sound this, my note of warning.

Then, again, a standard measure ought to be secure, fixed, not difficult to recover and compare if lost, as ours was often—as, for instance, in the Great Fire of London.

The standard metre at present in Paris, as history shows, is not exempt from the possibility of destruction, or it may be rendered useless, and if so, it can never be restored. The accuracy of a future metre measured as before will be a doubtful question, seeing that the French Committee in 1799, in place of measuring the arc of their meridian from pole to centre—finding it rather puzzling, and, altogether, like some essays we know, "comical"—were driven to measure the land surface from Dunkirk to Barcelona, over hills and valleys liable to earth movements and changes.

Objectors do more than object; they offer in its stead a far better system, simpler, more scientific, with all the advantages of *the decimal notation*, and one that would cause a mere infinitesimal change in our Anglo-Saxon weights and measures, and none at all, necessarily, in nomenclature. This may be accomplished merely by increasing our inch by its thousandth part, and would make the two-foot rule 25·025 British inches, to read off 25 new inches. And for new weights, five cubic (new) inches of our earth itself of mean density, under mean temperature and pressure, will weigh exactly one pound, or ten cubic inches equal to two pounds. This would be a true cosmic and scientific basis to work upwards and upon; the French using one element, water, as if the solid earth consisted of that only, and their merchants traded in nothing but that one liquid.

It would be more correct to state that five cubic inches (new inches) of matter having the earth's mean density would weigh within $\frac{1}{5}$th part of our avoirdupois pound, and our new pound would be increased so much, of course, to avoid decimals or fractions.

I state above the opinions of such men as Sir J. Herschel, or the Astronomer-Royal of Scotland, founded on the prior researches and opinion of Isaac Newton. Here, for instance, is what the first text-book to hand tells us on this subject. Sir E. Beckett states:—

"The Polar axis is 500 millions of inches one-thousandth part longer than our present inch, which probably only came by accident to be what it was when the standard was taken, and might just as well be that much more; for the other European nations have inches too, some longer than ours.

"The French metre is the worst measure in the world, because it is inconsistent with any natural one; whereas, our yard is the long stride of a man of good height, the natural length of his walking stick, and half his height, or half the stretch of his arms. And the metre is not even what it pretends to be, the four-millionth of a meridian of the earth, for the *measure taken was erroneous;* and if it were so, such a standard is of no more *real value* than the distance of the moon. Yet there are people who have engaged in a crusade to force on us this bad, erroneous, arbitrary, and revolutionary measure of a nation which tried to abolish the week, and make a new one of ten days, and whose language is declining all over the earth, while ours already prevails over more regions of the world than any other, and is evidently destined to advance."

The improved system here suggested by Beckett is such a one as I have described above, and is obtained by taking a millionth part of our semi-axis of revolution of the earth, giving us a new "foot-rule" of 25·025 inches, or 25 new inches, which Sir Isaac Newton calculated to be the measure of the sacred cubit given to the Israelites.

In 1875 a committee was held in London of the Meteorological Congress of Vienna, partaking of an international character, and the views of Professor Piazzi Smyth then applied for his answer, if peculiar, is important, and to the following effect.

"First. The only absolutely unique, straight, true, and characteristic reference for length measure in and for the entire earth and all nations living on it, is its *axis of rotation.*"

The French chose the meridian, but were unable to measure it, except in part, with inaccuracy.

"Second. If the greatest convenience of the greatest number of mankind, and the fact of man living on the earth, are of any importance, &c., the temperature reduction should be made to refer to the mean of all man's experience of that kind on the earth, and not to an extreme ideal point."

The French Committee decreed that their standard should be measured in a vacuum, and a temperature of that of extreme density of water, or 39° F. nearly, which the Astronomer-Royal terms "being so extra and dreadfully pseudo-scientific," no one can use it.

"Third. The true mean reference, or the mean of all man's temperature, is a temperature of one-fifth the distance from freezing to boiling of water—on a thermal scale reading from 0 to + 250.

"Fourth. The weight reference for all nations, if they live on this earth and have intellectual and scientific aspirations, should be founded on and evenly commensurable with the size and weight of this planet, the earth, as a whole; showing a grandly standard pound weight—to be further decimally sub-divided as necessary—equal to the weight of *five cubic pyramid inches of the earth's mean density;* to be taken in air of the standard pyramid's temperature and pressure, or that most suitable to man in his employments, and by no means, as with some modern doctrinaires, *in a freezing vacuum.*"

Leaving out the disputed question of the Pyramid of Ghizeh, we have here outlined a more simple and truer system than that of the academicians, scientific and earth-commensurate, which they failed to advance;

and, taking it all in all, it proves the wisdom of Mr. Bothamley and our Photographic Committee of Weights and Measures; and their refusal to sanction the use of the unscientific metre is shown to be well grounded, cautious, and most sensible.

I conclude by affirming that we should rejoice to adopt decimal notation, adhering to our ancient weight measures as they were probably ages ago; for instance, we have a very old pound in the Exchequer still nearer the weight represented by five cubic inches, as above.

THE NEW PREMISES OF THE PHOTOGRAPHIC SOCIETY.

The following circular has been issued by the Photographic Society:—

The movement initiated by the Council in June last, by commencing a list of subscriptions to a three years' guarantee fund, and appealing to the members for support. has been successful enough to warrant taking practical steps towards providing a "Home" for the Society.

The Guarantee List for three years as published in the June number of the *Journal* amounted to £136 1s. 6d. Since received—H. Bedford-Lemere, £1 1s.; Joseph Elliott, £2 2s.; Andrew Pringle, £3 3s.; Arnold Spiller, £1 1s.; Col. Waterhouse, £2 2s., making a total of £145 10s. 6d.

Probably this matter of a Guarantee Fund has escaped the notice of some of our Members who may desire to contribute, but the list is not closed, and further guarantees will be received by the Treasurer.

The guarantors will be called upon *pro rata* at the end of each year to reimburse the Society any excess of expenditure over income that may be incurred.

In the renewal of the agreement for lease of the Exhibition Gallery, &c., 5A, Pall Mall East, the rent has been increased by £70 per annum, which the usual income of the Society may be expected to bear.

At No. 50, Great Russell Street, directly opposite the British Museum, is a new building of some architectural importance; one of the floors has been engaged for the Society, with possession at Michaelmas. The flat comprises a front room measuring 35 feet by 16½ feet, with five windows looking on to the Museum. At the rear are landing, entry, lavatory, and three rooms respectively 16 feet by 10½ feet, 10 feet by 6 feet, and 14 feet by 9½ feet, which will afford two dark rooms and a library room.

The position of this "Home" is central; its accommodation can be daily at the service of members, with an assistant secretary in attendance. It gives facilities for arrangements that will, as stated in a circular issued to members, "raise the status of the Society, attract new members, and make the Society more useful to those who are already members."

In the agreement for the lease of the new premises, the usual clause as to underletting is modified so that "the tenant may permit the rooms to be used by members of other photographic Societies who may desire to co-operate with the Photographic Society of Great Britain in the interests of the art and science of photography."

For the first year of this experiment the guarantors will certainly have the pleasure of materially forwarding a good work, but an addition of 150 new members would speedily bring the income to the level of expenditure, and in this direction the considerate aid of all our members is invoked.

It may be here stated that, in order to join the Society, it is necessary to be proposed by one of its members "from personal knowledge"; in default of such knowledge, any lady or gentleman, by applying during the Exhibition to the assistant secretary in attendance, could probably arrange an introduction.

A. M. Mantell, *Secretary.*
W. S. Bird, 74, New Oxford Street, *Treasurer.*

THE CONVERSAZIONE OF THE PHOTOGRAPHIC SOCIETY.

Last Saturday, at a *conversazione* of the Photographic Society, held in its Exhibition Rooms at 5A, Pall Mall East, London, the President, Mr. James Glaisher, F.R.S., received the members and the invited guests, among whom were the Lord Mayor, Sir James Douglas, Dr. J. W. L. Glaisher, Dr. Lindsay Johnson, Captain Mantell, Dr. R. H. Lloyd, Mr. Seymour Conway, Mr. J. W. Swan, Mr. Cameron Swan, Mr. and Mrs. William England, Mrs. H. B. Pritchard, Mr. C. F. Pritchard, Mr. John Spiller, Mr. H. P. Robinson, Mr. W. J. Byrne, Mr. Chapman Jones, Dr. W. H. Plaister, Mr. A. Haddon, Dr. Low, Professor Finkelstein, Capt. T. Lamb, Sir H. Trueman Wood, Mr. R. W. Robinson, Mr. F. Wratten, Mr. W. H. Prestwich, Mr. Herbert Fry, the Rev. F. C. Lambert, Mr. H. J. Burton, Mr. W. E. Debenham, Mr. George Davison, Mr. W. S. Bird, Mr. A. G. Green, Mr. Bevan, Mr. W. Ackland, Mr. H. Perigal, Mr. Charles Alfieri, Mr. Edgar Clifton, Mrs. Friese Greene, Mr. J. Traill Taylor, Mr. S. H. Bhedwar, Mr. T. Sebastian Davis, and Mr. E. Cocking.

In the course of the evening, Dr. K. Selle gave his services, and included, by request, in the following programme of the music, two of his recent compositions:—Part 1 (9 o'clock)—"Valse D'Amour," MS., Dr. Selle; "Rêve après le Bal," Mr. C. B. Nash; "Tarentelli," MS., Dr. Selle. Part 2 (9.45 o'clock)—"Then You'll Remember Me," Mr. C. B. Nash; solo violin, "Fantasia on a German Melody," Dr. Selle; "Shells of Ocean," Mr. C. B. Nash.

Particulars about the Photographic Exhibition will be found in other parts of this issue. Suffice it to say that photographs of large size are fewer in number than usual, and that the Exhibition contains a great quantity of small work of good, bad, and indifferent quality. We believe that a difficulty the Society is in, in relation to rejecting a larger proportion of the pictures is, that it does not see its way to the refusal of the photographs of some of its own members. The greatest novelty in the Exhibition consists of a show of photographs by the new primuline process; the pictures attracted much attention throughout the evening. It may here be mentioned that the process is patented.

The attendance of the general public at the Exhibition last Monday was larger than usual, and among the first to enter the doors was Lord Rosse. Sir Francis Galton, of composite photograph celebrity, spent much time in the Exhibition on Tuesday.

Our description of the apparatus at the Exhibition will begin next week.

It is announced that the first meeting of the season of the Lantern Society will take place on the 13th inst., at 20, Hanover Square, when Mr. Andrew Pringle will give a lecture on "Modern Applications and Appliances of the Lantern."

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

[*From* The Times.]

The Exhibition is certainly remarkable for two things. It illustrates very forcibly the distiuct improvement which has recently been effected in photographic printing methods, and it shows a marked advance—consequent to soue extent on that improvement—if not in the artistic capacities of photographers, at all events in their powers of producing the most artistic results with the appliances at their command.

It was, until the last year or two, a common-place among photographers that, while continual progress had been made in the method of producing the negative, no important alteration had been effected in the methods by which the ultimate picture was obtained from the negative. The well-known "silver" process was really only a modification of the earliest device by which a photographic image was produced, and it bid fair, though often threatened, to hold its own as the ouc generally applicable meaus of priuting photographic pictures. Considering how many substances there are which are readily affected by light, and the numerous efforts uiade to utilise them, it is not a little remarkable that for so long no substitute for silver should have been found. The "carbon" process was, iudeed, a dangerous rival, and allied to it are the whole range of processes depending on the same curious property possessed by gelatiue and other like bodies in combination with oue of those chemical salts, of which the bichromate of potass is the best known representative, that of hardeuing and becoming insoluble in the light. None of these gave the best possible results, suitable as they were and are for very many purposes, aud for years the best pictures at Pall Mall were always printed in silver.

Then, some years ago, a new process of printing in platinuum—to be strictly accurate we should speak of this as a process of printing in iron salts, platinum beiug deposited on the faint image thus produced—was brought out. At first it was recoumended for its permanency chiefly, and because for it the glossy albumeuised surface of the silver print was no longer needful. Its tones, however, were somewhat cold, aud, if it was appreciated by the more artistic, the general public would have none of it. In the euergetic hands, however, of the firm which held the patent rights for the process great improvements were uiade, and now a wide range of tone is available, from the coolest pearly grey to the richest sepia brown. Gradually it caue more and more into use. The best workers adopted it. The public gradually got to appreciate it, and it now, except for the most ordinary class of pictures, is rapidly displacing silver.

The powers such a process gives were at once appreciated by the newest school of photographers, those who, not content with the most perfect transcript of nature—the ideal of a few years back—aspire to produce such a renderiug of nature as would be given by a skilled artist in monochrome. There is, indeed, a school, comprising many of the cleverest amateur photographers, who advocate impressionism in photography, and inveigh against the clear, sharp pictures, full of uinute detail, which were once cousidered its *ne plus ultra*. They would represeut, not merely what the ordinary human eye (improved to the perfection of a photographic lens) sees, but the impression made on the artist's miud. Here there are difficulties. The camera cannot select and discriminate; it cannot omit an ugly object, or introduce a beautiful or suitable one; it caunot make those slight adjustmeuts of the landscape which all paiuters do. The artist with a camera can but select his landscape, and choose his point of view, regarding, of course, those conditions of sky, sun, and cloud, light and shade, which make the difference between success and failure. A great deal, indeed, cau be done in the development of the picture, but this power is as nothing compared with that of the man with a brush.

But at all events, they say, we cau consider how a painter would treat this scene. He will indicate with skilful touches what he wishes us to realize, leaving something for the imagination. He will not give us the mean details, the buttons on that distant figure's coat, the texture of brickwork in that far-away cottage, the straw stems of the thatch upon its roof. Let us also avoid miuute detail, let us attempt broad treatment and encourage the imagination. We can at all events put our lenses out of focus and see the result. And, strange to say—in clever hands—the results were in mauy cases admirable. They charmed the artists, those artists, at least, who condescended to admit the existeuce of photography. The artist saw something much more like what he sought in his own work, and admired iu the work of his fellows.

But they scandalized the old school, and they aroused in photographic circles a coutroversy fierce aud loud. As is the wont in all disputes of au artistic nature, this one has been waged with no small decree of acrimony, and with many hard words on both sides. The worst epithet applied to the work of the old school seems to be "topographical," which, while admitting correctness of outline, couveys the covert sneer that the result is not even pictorial, let alone artistic. On the other hand, the impressionist work is "muddy" and "fuzzy," and, indeed, the fact that the chief tenet of the new school is that no object must be in sharp focus, would seem to offer a certain justification for such epithets.

The question is not easy of decision, perhaps will never be decided. Those, however, who care to judge for themselves have an excellent opportunity of doing so now, for on the walls of the gallery are many admirable—and some not particularly admirable—examples of both schools. Prominent among those of the newer style are the works of Mr. Davison, to whom the judges have rightly awarded a medal and the place of honour in the gallery. Perhaps no more beautiful laudscapes have ever been produced by photographic methods than Mr. Davison's "Old Farmstead" and "Breezy Corner," to the former of which a medal has been given. In this one especially atmospheric effect is admirably reudered, and, looked at from a suitable distauce, the picture gives a wonderfully true rendering of the subject, combining in large proportions the broad effect resulting from skilful artistic treatuent with the actual truth in detail of a photograph. A series of smaller pictures by the same artist on the opposite wall are equally worth study. All are printed in a sepia tone on the roughest of rough paper, and some—including, it appears, the large pictures—are done without a lens at all, merely with a pinhole. It is certainly a satire on the labours of the optician that, after the resources of science have been exhausted to produce a perfect lens, the best work cau be produced with no more elaborate optical instrument than a bit of sheet metal with a hole pierced in it.

Work of something of the same character has gained Mr. Lyonel Clark a medal for a small view, "Dedham Bridge," which has the further merit of illustrating a process invented by the exhibitor. Mr. Gay Wilkinson's exquisite little picture, "Sand Dunes," is another instance of the way in which genuine artistic skill can treat a subject simple and commonplace enough.

Mr. H. Tolley takes a medal for a fine view of Bantry Bay, one of an excellent series of which several others are almost equally deserving. Mr. Ralph Robiuson shows a number of clever character groups, one of which has received an award, and Mr. Shapoor N. Bhedwar has been equally fortuuate with one of his careful and well-executed series of views from posed models.

Mr. Lyddell Sawyer shows some fine views of the Tyne, and has received an award for a cleverly-arranged rustic group, "Two's Company," a slighted swain regarding with gloomy brow the dalliauce of his fair one with a more favoured youth. Mr. J. B. Wellington has an award for a study of figures, "The Latest News," aud Mr. J. E. Austin for his "Love Letter."

Two medals are given for portraits. Mr. R. H. Lord takes one for an excellent, if somewhat conventional, "Study of Two Children;" Mr. Byrne the second, for a large-size, full-length portrait. Mr. Van der Weyde's group, "An Invitation to Supper," might perhaps be classed with the portraits. It represents a number of persons in faucy dress, who may be supposed to be passing along a corrider leading from the ball-room to the supper, and its skilful arraugemeut aud admirable workmanship well justify the judges in their award.

Amongst pictures which have not received any award must first be mentioned those shown by two of the judges, Mr. Gale and Mr. H. P. Robinson; these are, of course, *hors concours*. Mr. Gale shows several figure studies and groups, perhaps the best of them "The Ferry." His work, which is all small, and full of the clearest, most delicate detail, may well be compared with that of Mr. Davison, for the two together show the extremes of their respective schools, both as good as they can be. It is as different as possible, occupying, indeed, the other end of the scale, and showing merits of an absolutely opposite character. Mr. Robinson's work also may be taken as a standard of excellence with which to measure the pretensions of the innovators, and he shows some fine, large landscapes with figures which may serve as excellent tests.

Two heads, "Studies from Nature," by the late Robert Faulkner, seem to have been overlooked by the judges, who might also have been almost justified in considering the claims of Mr. Arthur Burchett's "Belle Bretoune." Mr. Wainwright shows some good landscapes—of the sort which took prizes a few years ago—and so does Mr. Bedford. Mr. Dresser's "Corbière Rocks at Half-Tide" is worth notice; so is a photograph by the same gentlemau of boys playing leap-frog, as an illustration of the detail which can now be obtained in very rapid pictures. Messrs. West and Mr. Symonds show some of their well-known yacht pictures—good as ever, but, of course, not presenting auy really novel features. Mr. H. Robiuson, besides his pictures above referred to, sends aa interesting series of portraits of Royal Academicians. Of other portraits there are uot very many. Mr. Mendelssohn sends some of the usual fashionable style, and Mr. Byrne has a good collection. Among other pictures worth notice may be mentioued a frame of small views by Mr. K. Greger, Mr. Gambier Bolton's kittens, Mr. Kimberley's winter scenes, and Mr. Brownrigg's views of the Alhambra. Soue carbon enlargements by Mr. Flather, with what he terms "dry point needle finishing," are extremely good. There are not many lady exhibitors. Among them Miss Florence Harvey is the most successful; her "Dutch Fisher-folk" shows considerable skill in selection and groupiug. Mrs. W. P. Arnot also shows some heads and figure studies.

There are, as usual, some fine examples of photo-gravure, Messrs. Boussod, Valadon and Co. being the principal contributors. Looking at such a picture as the reproduction of Mr. Luke Filde's "Al Fresco Toilet," one cannot help the remark that it is well the length or breadth of the room separates these graceful figures from the self-conscious models appearing in too many of the photographic groups. Too close a comparison would be hardly fair.

Of illustrations of scientific applications of photography there are very few in the Exhibition, a fact all the more remarkable since photography has of late found so many and such important applications. A photograph of the moon, taken without an equatorial movement, is evidence of manipulative skill on the part of the producer, and of the speed of his plate, but it can hardly be considered representative of the work now being done in astronomical photography. Scientifically, the most interesting and the most novel exhibit consists of the illustrations of the photographic application of primuline, a new coal-tar dye. This substance, first brought to public notice at the recent meeting of the British Association at Leeds by Messrs. Green, Cross, aud Bevan, possesses the property of being decomposed by light. In its undecomposed condition it reacts with other coal-tar derivatives to form colouring matters of various shades. When decomposed it loses this power. If, therefore, a fabric dyed with primuline be exposed under a pattern or picture, the pattern or picture is reproduced. When the material has been protected from light it is iu a condition to combine with the other colouring matters; when the light has acted it is not. The picture, therefore, can be brought out in the colour desired by treatment with the proper colouring matter, which attacks the undecomposed portions, leaving the rest, where the light has done its work, unaffected.

The process would appear to be capable of very various uses, and suggests the application of photography in a new direction, thus adding yet one more to the many and diverse purposes for which it can now be applied.

The attention of the amateur—and who is not now-a-days a photographic amateur?—will be attracted by the collection of apparatus ou the table—cameras, slides, shutters, and all the myriad appliances considered necessary now-a-days for the successful prosecution of the art. When we heard of such feats as that recorded by Mr. Frank Stevens, who in his book "Scouting for Stanley," tells how, with his detective camera, he stalked and "took" the wild rhiuoceros at twenty yards distance, we must admit that there is a use for the hand-cameras which appear in such number on the table, even though we doubt if many of the pictures on the surrounding walls were obtained by their aid.

THE PHOTOGRAPHIC MANUFACTURERS' ASSOCIATION.

Recently we published a letter about "The Photographic Manufacturers' and Dealers' Association of the United Kingdom," of which not a few of the large photographic manufacturers are promoters. The following are its objects, as stated in its "Articles of Association:"—

3. The objects for which the Association is founded are:—(1) To promote the interests of the trade generally. (2) To protect, by means of the diffusion of informatiou, members of the Association against persons whoso character or circumstances render them unworthy of mercantile credit, and to promote the prosecution, in cases where the Council of Management of the Association think fit, of fraudulent debtors. (3) To effect the payment of debts due to members of the Association, to facilitate the prompt and economical realisation and distribution of the estates of persons who, being indebted to any of the members of the Association, may become bankrupt, or have their affairs liquidated by arrangement or composition with their creditors, and for this purpose to employ the proper, professional advice, and assistance, and to obtain, whenever circumstances will permit, the appointment of such officer or officers of the Association, or such other fit and proper persons as the Council of Management shall, from time to time, appoint in this behalf, to be receiver or receivers, inspector or inspectors, trustee or trustees, of such estates under the bankruptcy or arrangement by liquidation or composition of such persons respectively. (4) To keep a register of all cases in which persons indebted to any of the members of the Association may become bankrupt, or may have their affairs liquidated by arraugement or composition with their creditors. (5) To effect, as far as possible, the federation of manufacturers of, and dealers in, photographic appliances, for promoting the geueral interests of the photographic trade, and dependent or affiliated industries. (6) To suggest and support measures for the protection of traders and the improvement of commercial law, more particularly having regard to the aforesaid trades, and, with this object, to communicate and co-operate with tradiug companies, chambers of commerce, and other mercantile and public bodies in the United Kingdom, and also with the law officers of the crown, whenever thought desirable. (7) To co-operate or amalgamate with any other association haviug siuilar objects, aud to procure from, and communicate to them, such inforuation as may be considered likely to promote the objects of the Association. (8) To promote the interests of the photographic trade by holding exhibitions of photographic apparatus and allied appliances if thought desirable. (9) To do all other such lawful things as are incidental or conducive to the above objects.

In *Sun Artists* for July, embellished with four plates from medal photographs by Mr. Lyddell Sawyer, is a descriptive essay by the Rev. F. C. Lambert, M.A., in which are quoted the following words by Mr. Sawyer:—"I was born iu photography, uursed in it, and have been continually 'soaked' in it ever since. My father, uncles, brother, and cousins are most of them photographers." "How far," adds the essayist, "the subtle influences of heredity have contributed to the formation of Mr. Sawyer's art perceptions is a consideration of much interest." It will be noted that the sixth of the One Man Exhibitions at the Camera Club, to be opened for press view on the 6th inst., will consist of photographs by Mr. L. Sawyer.

ON THE REVERSAL OF THE NEGATIVE PHOTOGRAPHIC IMAGE BY THIO-CARBAMIDES.*

BY COLONEL J. WATERHOUSE, R.S.C., ASSISTANT SURVEYOR-GENERAL OF INDIA.

Reversal of the image is, as a rule, quite abnormal, and usually occurs from over-exposure or some irregular action of light during development. With dry collodion bromide plates it may be favoured by the presence of certain forms of organic matter, such as some of the aniline dyes, and in the case of gelatine dry plates it may occur by long keeping of the plates before development. Some years ago Captain Abney fully investigated the phenomena, and they have more recently been discussed at length by Professor Meldola in his excellent treatise on the "Chemistry of Photography." Captain Abney attributes reversal to oxidation of the sub-salt of silver, formed by the action of the first impact of light on the exposed salt of silver, the rays of lower refrangibility being powerful accelerators of this oxidation; also to the presence of alkaline haloids or of mineral acids. The presence of a soluble nitrite or sulphite or other reducing agents is also said by Captain Abney to be inimical, while the presence of oxidising agents is favourable.

In the present instance, seeing that an ordinary gelatine dry plate—which, with a normal exposure and developer, will develop a negative—will, with the same exposure, and merely by the addition of a little thio-carbamide to the developer, develop a positive, it is obvious that the reversal is not caused by any abnormal action of light, nor by the action of any special rays of the spectrum, and must be purely due to chemical causes. Over-exposure, as we have already seen, is unfavourable to the reversal, and, although the ultra-violet rays appear most active in producing it, it may be obtained in any part of the spectrum.

Against the theory of oxidation there is also the fact that the thio-carbamides, which undoubtedly are the active agents in producing these reversals, contain no oxygen, and, on the contrary, appear to be powerful sensitisers and reducers. Then, again, the presence of sulphite in the developer does not stop reversal, and even seems to favour it. Pyrogallol with sulphite has produced reversal with thio-sinamine, when with nitric acid and bromide it did not.

Although the action of the thio-carbamides in producing this reversal thus appears to be in direct opposition to the generally accepted theory, as stated above, I think it will be possible to reconcile the facts with the theory, and that these reversals follow the ordinary rules.

With normal exposure and development, a gelatino-bromide dry plate gives a negative image; but if the exposure be prolonged, or if the film has become oxidised from any cause, there is more or less tendency to reversal, and the original action of light, which would produce a normal negative image, is undone, and a positive image is produced. In the present instance, we have in the developer a substance which is capable of liberating halogen without the action of light, and, apparently, of oxidising and hardening the gelatine film. Thus, the film, although it may only have received a normal exposure to light, is really in the same state under the developer as if the exposure to light were being continued, and halogen being liberated all over it, as in the case of over-exposure. The halogen thus set free would appear to attack the parts reduced by the normal action of the developer, while the developer and the alkaline thio-carbamide complete the reduction of the unexposed parts, and thus bring about the reversal. During the process the thio-carbamide probably becomes oxidised, and loses sulphur which would combine with the silver, and, from the appearance of the images, very probably does so. From the experiments described above it would appear that, with thio-sinamine at any rate, a soluble sulphide is formed by the addition of the alkali. In the case of thio-carbamide, or sulph-urea, ammonia is also evolved by the alkali, and this may be the cause of the irregularity of the results obtained with it. The fact of the reversals being most readily obtained with eikonogen would seem to show that it also exerts some chemical influence on the result. Some of the plates produced show a peculiar blue tint very suggestive of *Prussian blue*, but how any such *iron* compound could form it is difficult to see.

The theory I have given above can, however, only be considered a provisional conjecture which requires further investigation before it can be confirmed.

The results obtained seem to warrant the hope that it may be possible to perfect the process for practical use, but a great deal of work has yet to be done before the conditions of successful working can be fully ascertained. As in all these processes of reversal, the balance between reversal and non-reversal is a very delicate one. In any case, an entirely new method of producing reversed images, with so many novel features, must be of interest, and, it is to be hoped, may throw some light upon the still unsolved problems connected with the formation and reversal of the developed photographic image.

Addendum.—Since the above was written, it has been found that, for copying line subjects, it is an improvement to use the eikonogen and phenyl-thio-carbamide developer, and before developing to give the plates a preliminary bath of dilute nitric acid at 5 per cent., or of bichromate of potash solution at about 3 or 4 per cent., the solutions being flowed over the plate in a tray, and washed off quickly. By this means greater density is obtained in the lines, together with cleaner whites. The reversal takes place slowly, but is more complete. The change is quite visible, the lines turning black on a light ground. Greater clearness of the ground may also be obtained by treating the plate, before fixing, with a solution of bromide of copper at 2 or 3 per cent., but care must be taken not to weaken the lines too much.

In working with thio-sinamine, good reversals have been obtained of half-tone subjects by adding about ten drops of bichromate of potash solution at 10 per cent. to the ounce of eikonogen developer.

For copying work the process seems quite practical, as proved by heliogravure plates produced directly from reversed positives taken in the camera, by which one operation (either the taking of a negative or of an intermediate positive) is saved.

* Concluded from page 744.

Adhesive Paste.—A paste which will stick anything is said by Professor Winchell to be made as follows: Take 2 ounces of clear gum arabic, 1½ ounces of fine starch, and half an ounce of white sugar. Dissolve the gum arabic in as much water as the laundress would use for the quantity of starch indicated. Mix the starch and sugar with the mucilage. Then cook the mixture in a vessel suspended in boiling water until the starch becomes clear. The cement should be as thick as tar, and be kept so. It can be kept from spoiling by the addition of camphor or a little oil of cloves.—*Chem. and Drugg.*

Notes.

Last Wednesday several of the members of the Council of the Photographic Society lunched at the Mansion House with the Lord Mayor, Alderman Sir Henry Isaacs. The object of the social meeting was to consider the question whether the time has not come to establish a Photographic Institute which shall teach, examine, and in proper cases give certificates of qualification. The idea is that photo-mechanical and all other branches of photography shall be taught practically, but that no commercial work shall be executed by the Institute. Dr. Lindsay Johnson has been most industrious in his efforts to promote this scheme. In other countries somewhat similar institutions have been established by their respective governments, and a notable instance is the Imperial Institute of Photography of Vienna, under the able direction of Dr. J. M. Eder. Belgium possesses a good institution of the kind in the Old Museum at Brussels, under the direction of a professor appointed by the Government. The chair was long held by the late Professor Rommelaire, who occasionally gave a series of public experimental lectures on photography, to which all interested were invited to be present without charge; all they had to do was to enter their names and addresses in a book. Promising students at this establishment are allowed the use of the laboratory and instruments; some of the latter are of the most costly character, especially one for solar photo-spectroscopy, with a long train of Iceland spar prisms.

In the course of the discussion before the Chemical Section of the British Association about the primuline —or, as its inventors have since christened it, the "diazotype"—process, a speaker whose name was not announced remarked that the browning of the leaves of trees in the autumn is due to the action of light. He said that if the green leaf of a Virginia creeper be taken, and covered with a device cut in black paper, then be exposed to sunlight, the portions of the leaf not covered will turn scarlet, therefore will yield a scarlet image of the design. The red colouring matter is formed as the product of the destruction of chlorophyll by light.

Not so very long ago, the Photographers' Benevolent Association had more money than it knew how to disburse. A member states that such is the case no longer, and that it would be glad of more funds to relieve persons in severe distress, whose circumstances have became known to the managers.

Messrs. Lewis & Co. have sent us some samples of what they call "kallitype" paper for trial. With some negatives we have found it to give good results, and with rather cold tones. The manipulations are no more troublesome than those of bromide paper, and the new paper seems to yield rather better prints from hard and vigorous negatives; the sample sent also acted fairly well with moderately thin negatives. The process has already been fully described in these pages, in one of the patents. At root it is an iron process, but the picture is developed in a silver bath, wherein silver is thrown down upon the image. The name "kallitype" is objectionable, because it is likely to confuse the public mind because of its resemblance in pronunciation to "calotype."

The *Papier Zeitung*, of Berlin, describes an improvement which, it is said, has been introduced in the art of photo-etching. As usual, the zinc plate is backed with asphaltum, and, with its pictured surface uppermost, is placed in a bath of dilute acid. The plate is then put in circuit with a dynamo machine, and when the current passes, the exposed portions of the zinc surface are attacked by the acid with such energy that, in a few minutes, the plate is etched to a sufficient depth. If this process bears out the anticipations of its authors, it will be a boon to the producers of process blocks, especially when time is of importance. The operation of etching generally occupies about two hours, during which time the acid baths have to be kept in continual motion.

Dr. Bullock, of Leamington, recently reported in the *Lancet* a case of poisoning by bichromate of potash, and the account given is worth the attention of workers with the carbon process, who are liable to a similar accident. The patient was employed at a furniture dealer's, where the bichromate was used for staining mahogany previous to French polishing. Having finished his day's work, the man took "a hearty draught" of bichromate solution in mistake for cold tea. He quickly found out his terrible mistake, and started for home, when he was attacked by violent sickness, and quickly exhibited all the symptoms of acute poisoning. The stomach pump was applied, and a mixture of bismuth, magnesia, and chlorodyne was given every two hours, with the result that the man recovered his usual state of health in three hours. This was a marvellous recovery, considering that the patient had actually drank about five ounces of a saturated solution of the poisonous salt. He was lucky in having a medical man at hand who evidently knew well how to treat an unusual case.

The School Board is not a popular institution, either with the scholars or the ratepayers; the first objecting to any kind of control over their sweet wills, and the second looking in vain for any notable improvement in the manners and language of those for whose education they are called upon to pay. We are told that the number of children who play truant from these establishments amounts to 150,000 daily, and a member of the Board has suggested a plan whereby the delinquents might be detected. He proposes to subsidise "a Punch and Judy man to go round the poorer neighbourhoods and give his entertainment, in order to prove how many children of school age and in good health could be collected in a given time." To make

the arrangements complete, we should suggest that the Punch and Judy man should have a camera hidden in the lower part of his stage, so that while the children were looking with rapt attention at the show, their portraits should be taken for future identification. Poor little waifs! Bumble still persecutes them, and would even make their one ray of sunshine a stumbling block to them.

When common-place people go to that uncommon place, Niagara, they often have their photographs taken with the famous falls in the background, thinking, no doubt, that nature is rendered more interesting by their presence. Such a portrait we saw the other day, and the fancy occurred to us that the idea might be greatly extended, and would most surely, in the hands of a careful worker, prove most remunerative. Suppose, for instance, one photographer were to confine his attention to taking the portraits of the clergy. He would have to provide himself with several backgrounds to suit their various views. Some would prefer being taken in front of the Metropolitan Cathedral; others would like Spurgeon's Tabernacle to loom in the distance; not a few would choose St. Peter's at Rome, and so on. The same idea could be extended to musicians, lawyers, statesmen, and all other professions and occupations. We commend it to our readers.

The photographic chart of the heavens, the preparation of which was decided upon at one of the recent International Congresses, is making great progress. The observatories which have got the work in hand include those of Greenwich, Oxford, Paris, Bordeaux, Toulouse, Helsingfors, Catano, Algiers, San Fernando, Rio de Janeiro, Tacubaga, Santiago de Chili, Cape Town, Sydney, Melbourne, La Plata, and the Vatican at Rome. At each of these stations from 600 to 700 diagrams in triplicate will be produced, the complete map being composed of 1,800 to 2,000 sheets. The next Congress, which will assemble in Paris on the 31st of March, 1891, will have an enormous quantity of material to deal with, and its work will be to arrive at a practical settlement of definite results. These world-wide labours will, no doubt, give a great impetus to the study of astronomy, though we are not quite sure that we can endorse the opinion of an enthusiastic evening paper, which says, "at no very distant time, any person having a simple micrometer will be able to produce on plates of cardboard those interesting representations which, until now, have been essentially within the province of the astronomer and the best organised observatories."

The most singular adaptation of photography is that practised in certain "prohibition" towns in America, where there is water, water everywhere, but not a drop of drink! The story is that Kodak cameras have become suddenly very popular, and that quite an epidemic of detective photography has broken out. The camera is thus used: "When a man, armed with one of these instruments, asks a friend if he would like to be taken, he never receives a negative. He simply presses a button, and his friend does the rest." This is a very delicate way of putting the matter. A wag would probably say that the new form of Kodak is utilised for the purpose not of taking portraits, but of taking drinks!

The number of duels of late, we fancy, will probably give a stimulus to the sale of photographs of swordsmen in action. We learn that the renowned Spanish fencer, Baron San Malato, has just returned from America, bringing with him one hundred photographs of positions, defences, and attacks in fencing, for which the Baron has posed. These photographs will doubtless be found very useful for the fire-eaters of the French press, most of whom—so we learn from an article on the subject—are very indifferent swordsmen. It is to be hoped, also, in the interests of the public, that further duels will be photographed. Each man's second should have with him an instantaneous camera, so that the partisans of each of the combatants may be satisfied that the duel was really fought—on which point there is sometimes a little doubt.

Mr. Henry Blackburn, the editor of *Academy Notes*, has started an idea which, we are afraid, will be neither acceptable to authors nor to the general public. He thinks the author should appeal direct to the reader through the agency of his own handwriting. Whatever is depicted in ink upon paper can be photographed, and we take it that Mr. Blackburn proposes that a novel or a poem read through the medium of a photographic reproduction of the author's handwriting should be the book of the future. If this really be his idea, we would humbly suggest, if the public are to read their favourite authors first-hand, as it were, that the favourite author should take lessons in caligraphy, as the vast majority of literary men write villainous hands. When novelists and poets write their "copy" like copper-plate, then it will be time enough to talk about photographic *facsimiles*.

The impression conveyed by the Exhibition in Pall Mall on the minds of those who have not noted the progress of photography of recent years, is very curious. We were in company this week with a man of intelligence, but whose knowledge of photography and photographs was very limited. He admired the pictures on the walls immensely. "But," said he, "these, of course, are not photographed from life, they are copies of pictures, I suppose?" He was much surprised when told that all the pictures, with very few exceptions, were photographed from nature. No doubt the cold tones now in favour, and the almost extinction of albumenised prints, assist the notion. The idea of a photograph years ago was that of a highly-glazed picture very warm in tint. This aspect, of course, has totally disappeared, and the similarity of tone to an engraving might well deceive a superficial observer. Something also is to be said on the ground of a greater knowledge of art which the majority of pictures now-a-days exhibit.

THE BRITISH ASSOCIATION COMMITTEE ON GEOLOGICAL PHOTOGRAPHS.*

Scotland.—Per Alex Ross, Marldon Chambers, Inverness (photographed by D. Whyte, Inverness), size 8½ by 6½ inches:—Registered No. 54, 56, Island of St. Kilda (looking N.W.), 1885—Three views showing weathering and form of gabbros and volcanic rocks. Photographed by R. Mc F. Muir, 35, Underwood, Paisley:—33, 35, Partick, near Glasgow—Three views of fossil trees in coal measures at Whiteinch; 49, Glenffer Braes, Renfrewshire, 1885—Nethercraig's lime quarry, showing master-joints. Per Ed. Ward, 249, Oxford Street, Manchester (photographed by Percy F. Kendall): Island of Mull (series of 17¼ plate views)—Salen shore—Dykes; ditto—Intrusive basalt; ditto—Columnar dyke; Arches, Mull—Columnar with tachylite; ditto—Cave above tide mark; ditto—Spheroidal weathering of basalt; Port, Bean—Faulted dyke; Gribun—Cliffs and talus; Carsaig—Marine denudation; Staffa—Columnar basalt; Staffa—Curved basaltic columns. Photographed by W. Norrie, 28, Cross Street, Fraserburgh, under the direction of Professor Heddle and L. A. Harvie-Brown. Size 5 by 8 inches. [Local numbers in brackets.] Registered No. 60, Island of Rum, 1889 [3]—Stack of Mharagast; 61, Bird's Island, Caithness, 1887 [7]—View of Holboru Head; 62, Holborn Head (E. side) [8]—Flagstone; 63, Ross of Mull [9]—Basaltic colonnade (the last of the twin columns); 64, ditto, Nun's Cave [11]—Basaltic arch; 65, Holborn Head—Rift in rocks; 66, ditto, "Devil's Bridge" [12]—Caithness flagstone; 67, Ross of Mull (looking through Nun's Cave); 68, Gribun, Mull [19]—Clustered basalt; 69, ditto [20]; Basaltic pavement; 70, ditto [21]—Trap dyke in basalt; 71, ditto [22]—Rent in trap dyke; 72, Shiant Island [37]—Basaltic north cliff; 73, Whitenhead Stack [54]—Contorted gneiss; 74, ditto [65]—North end of great fault through Scotland. Photographed by G. W. Wilson and Co., Aberdeen.† Selected list by Professor James Geikie. Large size, 11¼ by 7½ inches. West side of Hauda, Sutherland [2025]—Sea coast section of horizontal Torridon sandstone; Assynt Lodge, Sutherland [2031]—Archæan gneiss in foreground, overlooked by escarpments of Torridon sandstones (so-called Cambrian); Lochnagar [2551]—Corrie with tarn, in granite; The Door Holm, Tangwick, Shetland [2070]—Sea-stack or islet: Old Red sandstone lava-form rocks and agglomerates, showing denudation since period of glaciation: Granite quarries, Aberdeen [4048]—Granite; Buchan Coast, near Stains [4036]—Granite: showing structural features and their influence in marine erosion; Granite quarries, near Bullers-of-Buchan [4038]—Granite: structural features; Cior Mhor from top of Goat Fell [5742]—General views of granite mountains, sharp crests, corries, torrent-courses, and screes; "Cyclopean Walls," Arran [5739]—Granite mountains; knife-edged ridges of granite; weathering and débris; trap dykes cutting granite; Ben Nuish from top of Goat Fell [5743]—Corries, torreut-courses, &c., in granite; Carse of Gowrie from Kinnoul Hill [6601]—Old fluviatile and estuarine flat; Loch Maddy, North Uist [6174]—Characteristic landscape (Archæan rocks); Spiudle Rock, St. Andrews [6269]—Radiating columnar basalt, tuff, &c.; The Old Man of Hoy [128]—Weathering of Upper Old Red sandstone; sea coast; influence of joiuts; The Pot, Bullers-of-Buchau [204]—Sea action on grauite; influence of joints; Dunbay Rock, Buchan Coast [205]—Sea actiou; Duuotter Castle [494]—Sea Cliff—vertical Lower Old Red couglomerate; Gordie Stack and Drongs, Shetland [582]—The old Man, Storr, Skye [873]—Weathering of bedded basalt rocks; The Quiraring, Skye [893, 97]—Weathering of bedded basalt; The Kilt Rock, Skye [898]—Colnmnar basalt resting on Mesozoic strata; The Old Man of Wick [936]—Caithness flags (Old Red); sea coast action; influence of joints in formation of caves and stacks; The Stack of Brough, Wick [939]—Ditto; Clamshell Cave, Staffa [762]—Curved columnar basalt; West side of Staffa [765]—Columnar aud amorphous basalt; Boat Cave, Staffa [766]—Ditto and tuff; Colonnade, Staffa [767]—Ditto; Causeway of bending pillars, Staffa [768]—Amorphons basalt above enrved colnmnar basalt; Island of Staffa [2454]—General view; Colonnade and Boat Cave from the sea [2477A]—Ditto; Fingal's Cave—Three views, showing amorphous and columnar basalt; Parallel Roads in Glenroy [1234]—Glacial lake terraces; North Garlton, Orkney [1450]—Old Red flagstone; influence of joints; Mnchalls, sea cave [1734?]—Granite; Snilven, Assynt, Sntherland [1968]—Torridon sandstone outlier; Archæan rocks; The Maddy's, Loch Maddy [6090]—Characteristic landscape of Archæan gneiss; roches montonnées (weathered); Looking np Loch Eport [6174]—Archæan gneiss; The Grind of the Naver, North Maven [2051]—Structnral features of bedded, lava-form rocks (Old Red) and their influence on marine erosion; Scuir-na-Gillean, Skye [859]—General view of gabbro mountains; moraine in foregrounnd; Smaller size, 8 by 5 inches. The Brig o' Trams, Wick [1567]—Action of sea on old Red sandstone; The Drongs, Shetland [580]—Sea stacks; The Quiraing, Skye [384]—Weathering; The Lion Rock, Cumbrae [1290]—Basalt dyke; Samson's Ribs, Edinburgh [872]—Columnar basalt; East side of Staffa [1464]—Curved basalt; Spindle Rock, St. Andrews [929]—Radiating columnar basalt in tuff; Fiddle Bow Rock, Cullen [6058]—Marine erosion in crystalline schists; The Gloop, Duncansby Head [1586]—Old Red sandstone: Ben Stack, Sutherland [2739]—Archæan gneiss: Stacks of Duncansby [1585]—Marine erosion; Noss Head, near Wick [1576]—Caithness flags; Cliffs on Handa, Sutherland [2735]—Torridon sandstones; Windy Edge Pass. Dollar [2154]—Stream following joint in igneons rock of Old Red sandstone age; Inchnadamph, outflow of nndergrounnd river [2684]—Bared thrnst-plane in limestone; Knrka Stack, Balta, Shetland [2680]—Islet of gabbro; Holm of Noss [568]—Marine action along joints in old Red sandstone; Stack Sheog, Handa [2738]—Marine erosion in Torridon sandstones; The Pot, Bullers-of-Buchan [973]—Marine action in granite. The "Pot" is a "tunnel," the roof of which has fallen in; The Giant's Leg, Bressay [665]; The Needle-Ee Rock, Wick [2613]—Marine erosion in Old Red sandstone; Linn of Dee, Braemar [3657]—River action; cutting in crystalline schists: Staffa: Colonnade and Fingal's Cave [4575]—Columnar basalt; Valley of the Thousand Hills, Glen Torridon [591]—General view of moraines; Inchnadamph and Ben More [2685]—Limestone beds piled up by thrusting from east; Doune of Invernoghty, Strathdon [6890]—Alluvium and relics of old river terrace; The Herdsman Island, Staffa [1460]—Bird's-eye view of columnar basalt; Linn of Gnoich, Braemar [10143]—River cutting through schists along lines of joiuts; "Gulgh" at the Linn—Pot holes in bed of river.

Ireland.—Belfast Natural History and Philosophical Society—per W. Swainston, King Street, Belfast:—Registered No. 52, Whitehead, Belfast, 1889—Columnar basalt resting on eroded snrface of chalk; 53, Whitwell, Belfast, 1889—Amygdaloidal basalt resting on indurated chalk. Photographed by R. Welch, 49, Lonsdale Street, Belfast:—50, Giant's Causeway, Antrim—The "Giant's Fan," showing bases of large hexagonal columns; 51, Ditto—Middle causeway. Photographed by G. W. Wilson and Co., Aberdeen (a selected series of photographs revised by Professor James Geikie).* Giant's Causeway [219]—Columnar basalt; Ditto [225]—Ladies' wishing chair; uearer view of columns; Ditto [226]—The Keystone, showing tops of columns; Ditto [227]—The fan (similar to No. 226); Ditto [229]—The Organ (radiating columnar basalt); Ditto [230]—Pleaskin Head (colnmnar and amorphons basalt).

* Concluded from page 747.

† The Numbers in brackets are those of the photographers, and are inserted for convenience of reference.

* The numbers in brackets are those of Messrs. Wilson and Co., and are given for convenience of reference.

The Photographic Club.—The subject for discussion on October 8th will be "Flash Lamps"; October 15th, "Registratiou as Applied to Photographic Printing."

Photographers' Benevolent Association.—At the meeting held on 26th of September (Mr. Benham chairman), two loans were granted, and Messrs. Sawyer and Jessup elected members.

LANTERN SLIDE MAKING.*

BY C. BEADLE.

I do not think there can be a more interesting branch of our fascinating art than the production of slides for the optical lantern. As to the production of these, I do not pretend to have given any original research in the matter, but, rather, to have followed as carefully as I could the instructions usually issued with the plates by the makers.

In reading articles in the numerous photographic books and journals on the subject, great stress is usually laid upon the necessity for cleanliness of all dishes and measures. This is perfectly correct; at the same time, you will find that the ordinary care which has enabled you to produce a good negative will enable you to obtain a good lantern slide from it.

There are, of course, many means now of arriving at good results. I may say that I do not think anything can surpass, in beauty, those produced by the old collodion process, but, as the dry plates now in the market are so good, and the ease of production so great, I think we amateurs of little leisure hardly need anything better.

It is somewhat of a disputed point as to whether slides obtained by reduction by means of the camera, or those printed by contact, are the better: but, given a good negative, I do not think the effect is materially different, whichever way is tried. My own experience is that those produced by reduction are the sharper of the two, this quality being a great desideratum, for, however much our great artists may differ as to sharpness in positive prints, we all find that, when the subject has to be so many times enlarged upon the screen, the general fuzziness is, as a rule, quite sufficient to satisfy any of us.

With respect to plates, I do not believe there are any in the market but what will produce good results, and the best way of treating them is to work with the formula given. I do not say that at times it may not be necessary to alter it to suit, perhaps, a thin or over-dense negative.

Now we come to the subject of developers. Although I am no lover of hydrokinone as a developing agent for ordinary negative work, owing to the uncertainty of results and tendency to choke up distances, with a slow transparency plate it is different, and I hardly think for this purpose, by reason of its simplicity and cleanliness, it has yet been surpassed.

The developer which I use is as follows:—

Hydrokinone	160 grains
Sodium sulphite	2 ounces
Citric acid	60 grains
Potassium bromide	30 ,,
Water up to	20 ounces

And for the second solution—

Sodium hydrate	160 grains
Water up to	20 ounces

Use equal portions of each for development.

Then we come to the important subject of length of exposure, upon which hinges to the greatest extent the success of the finished picture. In my own practice, I have generally obtained the best results by giving as long a one as the plate will bear, and then developing smartly, when a clean, bright picture should be the result. Should the plate require prolonged development by reason of under-exposure, a yellow stain will frequently result. This may be removed by a solution of—

Cyanide of potassium	2 drachms
Water	20 ounces

But it is better to avoid having to do this, for it has the effect of somewhat reducing the density of the probably already too weak a picture, and, in spite of thorough washing, I have found leaves a granular effect on the film which is somewhat difficult to remove. The alum protosulphate of iron and citric acid clearing bath recommended with most issues of plates works better, but is seldom required if the exposure has been correct. The time of exposure varies according to the density and colour of the negatives. Lately, I have been working from those having a slight brown stain, due to the absence of sodium sulphite from the pyro developer, and find the average time, working with an aperture of *f*/22 in an afternoon light before five o'clock, to be about fifteen minutes. I am, of course, alluding to those slides made by reduction from a half-plate negative. By contact, using a kerosene lamp as illuminant, the flame of which is about 1½ inches wide, holding the printing frame about 12 or 14 inches from the light, the average time has been about forty-five seconds.

I may here remark that, as the result of experimenting with various developers upon the same brand of plates, those developed by the solutions pyro ammonia, ammonia-bromide, and carbonate of ammonia required a longer exposure than those by the hydrokinone formulæ. It should be borne in mind that the distance of the plate from the flame in contact printing influences the result considerably; a dense negative being the better for making the positive from it as near as four inches; on the other hand, a thin one should be held at least eighteen inches to two feet away. These alterations, in my opinion, modify the result in a better way than by varying the time of exposure. This same principle will work well when using bromide paper for prints.

When speaking of transparencies, of course we are not confined to the regulation size of 3¼ inches square, adopted now generally for the lantern. Larger plates can be treated in the same manner, limited only by the size of your negative or the depth of your pocket. It is of course necessary, when making these large window transparencies, and you do not wish the subject to appear reversed, to use those plates sold with a ground glass back, the glass of the front simply acting as a protecting cover, as in a lantern slide. Woodland or river scenes it hardly matters reversing for decorative purposes, in which case the plates with emulsion on plain glass can be used, and a fine ground glass used to diffuse the light. The emulsion on the plates being a slow one, I would remind you, is generally beneficial: certainly so when desiring to screen or locally expose for a longer time any portion of a negative. In this way I found, when making a transparency of an interior of Worcester Cathedral, the east window in the negative of which is partly choked by local over-exposure—which is frequently miscalled halation—the difficulty was overcome by cutting a small hole in a piece of rough card, and using this locally, after having given the requisite exposure to the bulk of the plate.

It will, no doubt, suggest itself to you as well that any portion of the negative being over this can be screened from the light in the same way. Recollect, when using, to keep the card moving, so as to prevent any hard line. In working large plates, should an error occur producing too dark a transparency, it can be reduced by the ferricyanide of potassium and hypo (freshly mixed) in the same way as you would for a negative.

I mentioned just now that I thought a slide made by reduction in the camera the better of the two plans; in

* Abstract of a paper read before the North Middlesex Photographic Club.

fact, in my case, I have few plates that any slide can be made out of except by that means. Sometimes the instructions given for this purpose read a little formidable, more so than there is reason for.

In reductions, the plan I use saves all blocking-out of the bath-room or other windows used as our dark-rooms. It consists of two parts, a platform with an end to hold the negatives of any reasonable size, and a box to put the same in when the camera has been adjusted on it. The platform has a narrow groove down the entire length to enable the camera to pass up and down, and can be fixed in any required position by means of a thumb-screw underneath. At the extreme end is erected a set of frames to hold any negatives from a quarter to whole-plates, these being held in position by small brass buttons. It is probable that most of us desire to reduce from one size; that being so, it a great deal simplifies matters, as when once in sharp focus to the required size, a mark can be put upon the base-board or platform, and another on the camera where racked out to, and in this way all trouble of focussing upon any future occasion is avoided, and the plates can be exposed one after another without fear of varying. The place for negatives is adjusted so that the exact centre comes immediately opposite the centre of lens. The complete action is as follows. The lantern plate being placed in the dark-slide (I use an ordinary quarter-plate carrier with a small strip of wood half-inch wide to keep the plate from shifting out of the centre), the slide is placed in the camera, which, we will suppose, has been adjusted on the platform to the required place; stop the lens down to *f*/16 or *f*/22 (if the light is good, the latter), cap the lens, draw the slide, and place the whole in the box, which has been made with a light-tight fitting cover, and a door at one end where the negative is; place this box now in any position you may find suitable, either pointing to the sky through a window or door, or on its end in the garden, it matters not, so long as it can have the light free of all obstruction. In the event of not being able to get clear of walls or trees, a white cardboard reflector must be used, placing it at an angle of 45° to the negative. In a box such as I have described, the door may be made use of to hold this in position.

I must not forget to mention that in using a box made in this way, it will be necessary to use a lens working at not more than 6-inch focus, as in a longer lens the dimensions of the box would become too great for carrying about. The exposure is made by opening the door of the box (cap taken previously off lens), and the lid shut down when not in use. I have found it, being practically dust-tight, useful to stow away the ever-increasing impedimenta.

Death of Mr. Samuel Fry.—With much regret, though not with surprise, the announcement of the above event will be received by all who were acquainted with the deceased, who was the founder of the firm of Samuel Fry and Co., now the Fry Manufacturing Co. Mr. Fry had for some time been suffering from heart disease, which terminated fatally at Dumpford House, near Petersfield, at the comparatively early age of fifty-six. Mr. Fry was one of the veterans of photography, and his name is closely associated with the dry plate revolution. Prior to the increase of business pressure in the manufacture of dry plates, and failing health, he was a frequent and valued contributor to the Photographic News and Year-Book. The interment took place yesterday at the Friends' Burial Ground, Kingston-on-Thames. Among those present were Mr. Hayman, Mr. Matthew Whiting, and Mr. T. Piper representing this paper.

LANTERN SLIDES AND LANTERN SLIDE MAKING.*

BY F. C. BEACH.

One of the chief requirements of a negative for slide-making is that it shall be very sharp and distinct, with sufficient density in the high-lights to prevent the clouding of the sky portion of the slide. A moderately dense negative, therefore, generally produces a crisp slide, since it enlarges the limits of exposure, and allows more latitude in development. An excellent slide, however, may be made from a very thin, clear negative by careful timing and a proper developer. A foggy negative will produce an unsatisfactory slide. Thus, much depends on the negative; in selecting such for slide work from a summer's collection, reserve only those that are sharp and of good average density.

There are two different ways of making slides; one is the contact method, and the other reduction by the camera. In the contact method, a portion of a large negative is sometimes selected, on which the sensitive plate is laid in contact, film side next to the negative film, in a printing-frame. Over the back of the sensitive plate should be placed a sheet of black or orange paper, to prevent reflection of actinic rays from the back of the sensitive plate against the underside of the sensitive film. Holding the frame towards a screened gas light, or kerosene light, about eighteen inches distant, an average exposure of ten seconds is given by quickly removing and replacing the screen. A thin negative will need but two seconds, a very dense negative from twenty to thirty seconds, and one having a yellow tinge may take a minute.

The different capabilities of different negatives may be quickly learned by a few trial exposures. It is advisable to grade the negatives according to their density, so that a uniform exposure may be given to a certain number, which should result in the production of satisfactory slides. For contact work, many prefer to use 4 by 5 negatives, selecting the centre for the picture, but a better size is the $3\frac{1}{4}$ by $4\frac{1}{4}$ plate, which has margin enough to allow the proper locating of the sensitive plate, and makes a picture better proportional to the lantern size.

As an illuminant, artificial light, diffused daylight, or magnesium flash or ribbon light may be employed. By placing four printing-frames, containing as many negatives and plates, twenty inches equidistant from a central point, one exposure of an inch and a-half of magnesium ribbon burned over the central point, moved about a little, will affect equally the four negatives. The plates thus exposed may all be developed at once in a $6\frac{1}{2}$ by $8\frac{1}{2}$ tray with the probability of securing good slides; so that by the contact method slides may be made very rapidly during the evening.

Reduction by the camera is largely preferred, because the variations in the size of the image to be impressed upon the sensitive plate are so easily and quickly affected. Usually the camera is placed on a long board, holding at one end a frame in which are removable kits or frames to hold different sized negatives. A printing frame with the back removed may be utilized for this purpose. The negative is best illuminated by facing that portion of the sky opposite to the position of the sun, though it is possible to use direct sunlight by interposing a ground glass between

* Read before the Society of Amateur Photographers of New York.

the window and the negative, and giving a shorter exposure. The space between the negative frame and camera should be covered by a light black cloth to exclude extraneous light. I prefer to have a special frame fitted to the back of the camera, with a 3¼ by 4¼ aperture cut in the centre, arranged to support or hold a 3¼ by 4¼ double plate-holder, rather than to employ a kit in a large holder, because it is more convenient and more easily handled. Mr. Chas. Simpson suggested, some time ago, a swinging or pivoted frame for holding the negative, that the picture might be levelled easily in case it was taken at an angle on the plate. He also provided simple means for sliding the frame horizontally and vertically. These movements are very advantageous, and should be provided if one is to work quickly. I generally employ a rapid rectilinear lens, though this is not necessary, as a wide-angle lens will answer just as well. Any lens that will give a sharp picture stopped down to *f*/16 will do.

There have been three favourite kinds of developers for lantern slides—pyro, hydroquinone, and ferrous oxalate. The two latter do not stain the fingers. Pyro should be preserved with sulphite of soda, and combined with such alkalies as soda and potash. Four ounces of sulphite should be mixed with one ounce of pyro. This is undoubtedly the quickest developer, and, when the exposure is nearly correct, imparts a brownish tone to the slide. Not more than two plates should be developed in succession in one solution. A working formula is as follows:—

Pyro	2 grains
Sulphite of soda	4 ,,
Carbonate of potash	3 ,,
Water	1 ounce

If the shadows develop too dense, the amount of pyro should be decreased. A hydroquinone developer contains more hydroquinone in proportion than there is pyro in the pyro developer to obtain the same amount of density, but the difference is made up by the greater number of plates that can be developed with it. The following is used successfully:—

Sodium sulphite	40 grains
Hydroquinone	15 ,,
Water	1 ounce

To this is added fifteen grains of carbonate of potash, which forms the developer, with which from six to eight plates may be developed in succession.

The ferrous oxalate developer, commonly known as the *iron* developer, has for a long time been regarded as the standard for lantern slides on dry plates, and, when properly handled, it does produce exquisite results. But it does not keep well after being mixed, and rapidly deteriorates on exposure to the air. The point most to be feared is the precipitation of the ferric salt by having too much iron in proportion to the oxalate of potash. Two separate saturated solutions of sulphate of iron and of oxalate of potash are made by dissolving each in hot water. The iron is acidified with five drops of sulphuric acid to each pint, while the neutral oxalate may be made acid by adding oxalic acid until blue litmus paper is turned red.

To develop, use—

Oxalate of potash solution	6 ounces
Iron solution	½ to ¼ ounce

When the detail has appeared, if the development is too slow, about 1½ ounces more of the iron solution may be added, which will increase the density. It is advisable, after fixing, to immerse the plate in a clearing bath of alum and citric acid.

We now come to a new developer which will supersede all others for lantern slide making, as it gives to the film a blueish black tone very similar to the palladium or platinum tone usually given to wet-plate slides. I refer to "eikonogen." The proportions recommended are:—

Sulphite of soda	10 grains
Eikonogen...	5 ,,
Carbonate of potash	2 ,,
Water	1 ounce

A developer thus made will develop rapidly from seven to ten slides in succession, each of which will be absolutely clear glass in the high lights, and have in the shadows a density so delicate that the light of the optical lantern will bring out in fine relief all the details. The slides possess a richness in crispness and sparkle that is seldom seen in wet plates. The rapidity of the action of the developer may be retarded by adding a few drops of a ten grains to the ounce solution of bromide of potassium. After fixing, the slides are washed in changing water for half an hour, and they should be rubbed with absorbent cotton to remove any floating particles that may have become attached to the surface, and then set up to dry.

There seem to be several different ways of labelling and marking slides, but the system adopted by the American Lantern Slide Interchange appears to be the simplest.

After the cover glass is put on by the usual gummed strip paper, holding the picture in its natural position, the descriptive label is attached to the right hand side of the cover glass with the reading matter facing inward, while the thumb label is placed on the lower left hand corner. The reason for this is that, as the slide is taken up and held between the thumb and finger with the thumb on the thumb label, the description and name on the label at the other end is very easily seen and read. Still holding the slide with the thumb and finger, it is at once pushed into the slide-carrier of the lantern, and appears correctly on the screen. The cover glass should invariably go towards the condenser of the lantern. If the plan described is used, there need be no mistake in putting through a number of slides.

The utility, benefit, and pleasure to be derived from lantern slides are self-evident to all, and I look for more extended work in this field this winter, and trust many new members will try a hand at it.

The Rights of Photographic Publishers.—The reproduction of photographs in the illustrated press, which most photographic publishers regard as a welcome advertisement, is resented by a few as an infringement of their rights of property. Until last month we have never been refused liberty to reproduce any photograph, the acknowledgment of its source being invariably regarded as an adequate *quid pro quo*. Last month, however, M. Barraud has actually threatened newspapers with legal proceedings for reproducing without his leave a photograph of Cardinal Newman, and the same month brought me a formal complaint from the London agent of the Hanfstaengl Photographic firm of Munich, that I had infringed their copyright in reproducing by a small process block a photograph of Lenbach's painting of Bismarck, which is their property. As I don't wish to infringe anyone's rights, whether they were legally secured or not, I at once stopped the sale of the number containing the picture in question until I could reprint it, which I did at once, omitting the illustration complained of. I naturally regret very much having unwittingly offended the owners of Lenbach's "Bismarck." In the innocence of my heart I thought I was doing them a good turn.—*Review of Reviews.*

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

V.—Action of Light on Sensitive Film.

Our investigations have not only revealed the fact that one single density taken by itself is not characteristic of the exposure which the sensitive film received, since the density may be partially due to "fog," or may not be developed to its extreme limit, but the experiments have also clearly shown that the ratios of two densities, exclusive of fog, is a function of the action of the light on the plate. It will be noticed that in all these experiments the exposures given varied between ten seconds and eighty seconds, and the source of light was always a standard candle placed exactly one metre off the plate. If we tabulate the ratios found between the ten seconds' and eighty seconds' exposures in these experiments, we see at once that the ratio, though constant for one particular plate, is very different for different plates.

Name of Plate.	Ratio of Densities for Exposures $\frac{40''}{10''}=4$	Ratio of Densities for Exposures $\frac{80''}{10''}=8$	Experimental No.
Ilford 'Red Label'	1·53	1·63	13
Wratten 'Drop-shutter'	1·71	1·92	13
'United Kingdom'	3·12	4·27	13
'Manchester Slow'	2·97	3·82	15
Do. Do.	2·85	3·80	16
Do. Do.	2·84	...	14
Own make ..... Batch A. ..... Exposures $\frac{160''}{20''}$			8·00
,, A. ..... ,, $\frac{240''}{30''}$			5·30
,, A. ..... ,, $\frac{1440''}{180''}$			3·00

The ratio is, for the same exposures, smaller for rapid plates than for slow plates, but even with the same plate the ratio between two densities varies for exposures which bear the same ratio to each other, but are different in absolute value, as is seen from the experiments given in the above table, and made with plates prepared by ourselves.

It is certain, therefore, that the ratio between two densities depends not only on the ratio of the exposures, but also on the sensitiveness of the plate and the absolute values of the exposures. The following investigations were made to discover the connection existing between exposure, sensitiveness, and density produced.

Unit of Exposure.—For these investigations it was necessary to adopt a standard unit of exposure. As unit of light we have chosen the intensity of a standard candle at one metre distance, and as unit of time the second, so that our unit of exposure is the product of the intensity of the standard candle at one metre distance and the second, and we call this unit of exposure one candlemeter second. We find for experimental purposes, with plates of average speed it is an excellent unit, easily procured, and of sufficient constancy to permit of satisfactory repetitions of experiments. There are a few precautions necessary to ensure uniform results. The flame of the candle cannot be relied on until it has settled to a height of nearly 45 mm. measured from the top of the spermaceti to the top of the flame, as shown in fig. 4. The candle must be protected against draughts, and this is best done by placing it within a black box having one side open. This also prevents the illumination of bright objects on the working table and consequent reflections. The candle should be extinguished by an extinguisher, and kept covered up while not in use.

As regards measuring time of exposures, we use a chronograph watch, or a metronome for short exposures, but we find that errors of exposures become too great if less than ten seconds are measured. If we wish to give shorter exposure than ten candlemeter seconds (C.M.S.) we place the standard candle two metres off, thus reducing its intensity to one quarter.

It is scarcely necessary to say that we have carefully ascertained that, within such limits of exposures as our experiments embrace, it is immaterial whether an exposure be made with a light of $\frac{1}{4}$ candlemeter for forty seconds, or a light of one candlemetre for ten seconds. We have also proved by experiment that, as far as the ratios of densities are concerned, they remain constant, whether the exposure be made with a candle, with a petroleum lamp, or with daylight, so long as the product of intensity of light and time of exposure be the same. The intensities of such different sources of light cannot, however, for this purpose be compared by the ordinary Bunsen photometer, but must be compared by photographic experiments. But with careful work even single densities can be reproduced with tolerable accuracy. For instance, on three separate days we obtained on three separate plates of the same batch, by carefully measuring the time, both of exposure and of development, densities 0·750, 0·730, and 0·720 respectively. Four different standard candles gave upon one plate in ten seconds the following densities: 0·490, 0·490, 0·500, 0·480.

With the standard candle we investigated, in the first place, the general effect of prolonged exposure on the density, *i.e.*, we ascertained how much silver was reduced by different exposures.

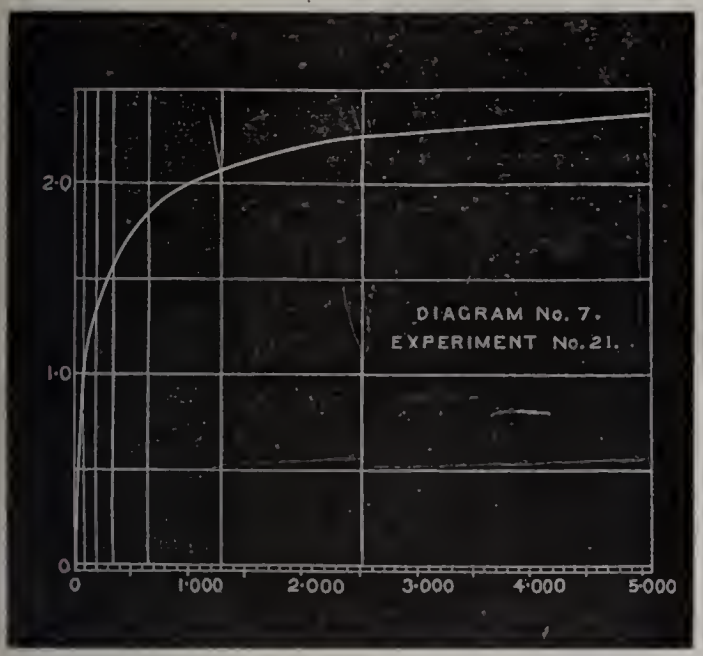
Experiment 21.—A "Manchester Slow" plate exposed, developed with ferrous oxalate, and measured, gave:—

Exposure C.M.S.	Density.	Difference.	Exposure C.M.S.	Density.	Difference.
0·625	·045	...	80	1·010	·255
1·25	·055	·010	160	1·270	·260
2·50	·085	·030	320	1·555	·285
5·00	·175	·090	640	1·885	·330
10·0	·250	·075	1,280	2·088	·203
20	·460	·210	2,560	2·262	·174
40	·755	·295	5,120	2·352	·090

It will be seen that, every time the exposure is doubled, the density increases, at first slowly, then considerably: and (disregarding errors of experiment) from 40 C.M.S. up to 1,280 C.M.S., every time the exposure is doubled, nearly an equal addition to density is the result, the addition to the density being on an average 0·266; but after an exposure of 1,280 C.M.S. further doubling produces less and less increase in density. The first few densities are too small to admit of accurate measuring.

* Continued from page 750.

This series of results is represented graphically on diagram No. 7, the exposures being chosen as abscissæ, the densities as ordinates; from this diagram it will be seen at once how rapidly densities grow at first as exposure is increased, and how slowly at last the densities tend towards a limit.



The following series of exposures is carried still further in order to ascertain the character of the curve representing the action of the light on the silver bromide, and to learn, if possible, something of the limit towards which the curve tends.

Experiment 22 :—

Exposures C.M.S.	Densities.	Difference.	Exposures C.M.S.	Densities.	Difference.
1	·060		1,024	2·985	+ 450
2	·160	+ 100	2,048	3·115	+ 130
4	·340	+ 180	4,096	3·280	+ 165
8	·500	+ 160	8,192	3·405	+ 125
16	·715	+ 215	16,384	3·508	+ 103
32	·940	+ 225	32,768	3·474	— 0·034
64	1·345	+ 405	65,536	3·280	— 0·194
128	1·875	+ 530	131,072	3·128	— 0·162
256	2·290	+ 415	262,144	2·920	— 0·208
512	2·535	+ 245	524,288	2·464	— 0·456

This series of results could not be graphically represented to advantage by choosing exposures as abscissæ since they vary from one candlemeter-second to over half a million. But it is evident that prolonged exposure gradually reduces the density attainable after development.

The graphic representation of experiment 22 on the same scale as experiment 21 would require a diagram about 500 times as long as diagram No. 7, and nothing of any value would be learnt from such a diagram.

What we really wish to ascertain is, whether it is possible to produce a theoretically perfect negative, such as was defined, and what the connection is between the densities and the exposures.

(*To be continued.*)

A correspondent suggests the employment of paper, pressed and chemically prepared, for making lantern bodies, lens tubes, and slide frames, as it would tend considerably towards lightness.—*Optical Magic Lantern Journal.*

Patent Intelligence.

Specifications Published.

18,609. *November 20th*, 1889.—"A Cutting Shape." Benjamin Jumeaux, 11, Brighton Place, Stretford, Lancashire, Artist.

My improvements relate particularly to the thick pieces or sheets of glass which are used when cutting off the edges of photographic prints or pictures to the size of the glass plate.

At the present time the glass sheet is placed upon the surface of the print, picture, or mount to be cut to size, and, owing to the smooth surface of the former, it is apt to slip or move under the pressure of the knife when cutting.

In order to overcome this difficulty, I propose to grind or otherwise form three or more, preferably four, small recesses in the underside of the glass, say near each corner. Into these recesses are secured by any suitable cement small pieces of india-rubber, cork, flannel, or other suitable material, the surfaces of which project slightly beyond the face of the glass : by this means the glass will be prevented from slipping sideways during the operation of cutting or trimming the edges of prints, pictures, or mounts.

The improved appliance for use when cutting prints and the like ; said appliance consists of a sheet of glass provided with recesses in which are secured pieces of india-rubber, cork, or other suitable material substantially as, and for the purposes herein set forth.

19,926. *December 11th*, 1889.—"Dissolving-view Lanterns." Henry Bond, 126, Wilderspool Road, Warrington, Newspaper Manager.

My invention consists of a device for utilising the light derived from an oil lamp, or other suitable illuminant, in two directions, in such a manner as to produce and converge upon the screen two independent and simultaneous discs or fields of view from one light.

The rays utilised are those shining in the directions right and left of the operator standing behind the illuminant, and facing the screen.

Condensers are placed on each side of the illuminant with their edges towards the screen, their axes corresponding with the two lines of light from the central source.

The slides or transparencies to be thrown upon the screen intervene in front of the condensers in the usual way.

Images of the slides are reflected to the objective lenses (placed with their axes at right angles, and in a horizontal plane with the axes of the condensers) by plano-mirrors or specula placed vertically between the slides and the objective lenses, and fixed in regard to the axes of those lenses, and of the condensers at an angle of forty-five degrees.

Means for bringing the two discs of light together, at varying distances of the lantern from the screen, are provided by the movement of one or both optical systems independently on a common pivot under the illuminant, the axis of which pivot lies in a vertical line drawn through the centre of the illuminant.

An alternative method is to preserve the condensers in a fixed position in regard to the source of light, and to adjust one or both mirrors and their associated objectives on separate centres or pivots with vertical axes, which axes lie in the planes of the reflecting surfaces, and cut the horizontal axes of the condensers.

5,227. *April 3rd*, 1890. — "Photographic Cameras." Charles Whitney, Chicago, Manufacturer.

My invention relates to the improvement of photographic cameras and their adjuncts, my improvements being especially designed for the variety which may be termed "pocket" cameras, or those of such diminutive size as to render them conveniently portable in the hand, or by being otherwise carried or stowed away on the person, ready for immediate use whenever desired ; and of the adjuncts referred to, my invention relates, particularly, to the lens-shutter detail for the cameras; to means for controlling a flexible sensitised ribbon for the negative plates, in the form both of a continuous sheet or ribbon, or in separate plates cut to desired size ; to the numbering and construction of the negative ribbon, and to the cutting mechanism

for severing it into plates, and means for permitting observation of the position of any negative plate for its exposure.

The objects of my improvements are, to provide a construction of the instrument whereby it shall be produceable in the various forms, and in the comparatively diminutive dimensions with proportionately large capacity to adapt it to serve the convenience for which it is intended, and the purpose of perfecting and simplifying the operations necessary in making negative plate exposures.

This invention cannot be adequately described without numerous drawings, which will be found in the patent.

12,155. *August 2nd*, 1890.—"Etching upon Glass." Ben Zion Meth, 6, Wollinerstrasse, Glass-Worker, and Hermann Kreitner, 83, Chorinerstrasse, Berlin, Merchant.

This invention relates to a process for etching upon glass, differing from the methods hitherto employed in that the etching is effected by a cold process, and with the aid of an india-rubber stamp, the etching of such articles as bottles, lamp glasses, glass plates, and similar objects being considerably accelerated, and the cost of treatment reduced.

In carrying out our process we use an etching solution prepared in the following manner:—10 grammes of pure fluoride of ammonium, ½ a gramme of common salt, and ½ a gramme of carbonate of sodium are well pounded up in a porcelain mortar, and mixed in a gutta-percha bottle with 4 grammes of highly-concentrated fuming hydrofluoric acid and 2 grammes of concentrated sulphuric acid; the bottle being well shaken. In a separate vessel, made of lead, ½ a gramme of crystallised fluoride of potassium is dissolved in 1 gramme of common muriatic acid heated in a hot water bath. Of the latter mixture 1 gramme is added to the mixture previously prepared; the contents of the bottle being again agitated and mixed with 2 drops of silicate of sodium and 1 drop of spirits of sal-ammoniae.

A small quantity of the etching solution thus formed is dropped upon a sheet of india-rubber covered with a cloth pad, which is rubbed until almost dry; whereupon, by means of an india-rubber stamp, bearing the design to be reproduced, a portion of the liquid previously absorbed by the pad is transferred to the surface to be etched, with the result that the design is eaten out.

Should a deposit be formed in the gutta-percha bottle in consequence of the etching solution not having been used for some time, such deposit may be dissolved by hydrofluoric acid.

Correspondence.

EXHIBITION IN CALCUTTA.

Sir,—With reference to the intimation published in your paper that on application to me particulars can be had regarding the coming photographic exhibition in Calcutta, I shall be glad if you will now add the information that I have returned to India per *Shannon* ss., and, therefore, further letters to my address will not receive reply. John S. Gladstone,
Sec. Phot. Soc. India.

FISHING MATCH AT AMBERLEY.

Sir,—As the photographer at the fishing match at Amberley referred to in your "Notes," I may inform the writer that I am an angler, though I was not fishing in the match, and also that it was impossible to get a photograph of the contest. Three hundred anglers spread along three miles of winding river proved too much for me, though I got some successful views of the river, showing characteristic groups of fishermen.

I must make an objection to the remark that anglers do not care about beauty of scenery. Even the humble East End club men appreciate the beauties of the river and surrounding landscape, and enjoy the outing and fresh air, and the loveliness of nature, even though they may catch no fish.

I am inclined to fancy that the writer must be a bit of a fisherman himself. Whether he be or not, I shall be very pleased to show him a selection of shooting and fishing photographs whenever he likes to make an appointment. I may mention that one of my fishing views is on view now at Pall Mall. Reg. B. Lodge.

1, *Chase Green Villas, Enfield, October 1st.*

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Sir,—Please insert this corrected list of subjects for discussion, and oblige:—

October 9th.—First lantern night, and demonstration on "Lantern Objectives," by Mr. T. E. Freshwater.

October 16th.—"Pictorial Definition," adjourned discussion resumed by Mr. W. E. Debenham.

October 23rd.—"Preparation of Dry Plates," by Mr. W. H. Prestwich.

October 30th.—"Photography in Colours."

Visitors cordially invited. R. P. Drage, Hon. Soc.

Proceedings of Societies.

Photographic Society of Great Britain.

At the technical meeting of this Society held on the 30th ult., Mr. Friese Greene occupied the chair.

Specimens of a new process of dyeing by a photographically sensitive compound of primuline and nitrite of sodium were shown by Messrs. Green, Cross, and Bevan, and the process—except the exposure to light, which had been given in the daytime—was demonstrated. The effect of light was to render the compound no longer susceptible of development by the various agents used, which were, beta naphthol for red, resorcine for orange, alpha naphtholine hydrochlorate for purple, and alpha naphthol sulphonic acid for crimson. A piece of calico which had received an exposure to light, except where shielded by leaves to form a pattern, was developed by means of brushes with these agents, forming the pattern in the colours mentioned.

In reply to questions Mr. Green, the demonstrator, said that if too long an exposure was given, the resulting image would not be deep enough, whilst with too short an exposure the effect was dauby.

Mr. Arnold Spiller asked whether the effect of light on the compound employed was of a reducing or an oxidising character?

Mr. Green replied that it was neither. Very good gradations were obtainable with proper exposure.

Mr. John Spiller had tested the images produced by this process with all the ordinary reagents of the laboratory, as well as by exposure to direct sunshine, without finding any change in them, from which he augured greatly in favour of their permanence.

Mr. Arnold Spiller enquired whether there was anything of a tanning action in the product of the development? In that case the image might be formed in gelatine, and the light parts could be dissolved out by hot water.

Mr. Greene said that he did not think there would be any tanning action.

Mr. F. Varley showed a stereoscopic camera arranged for the production of successive negatives at a rapid rate. Mr. Friese Greene had with this camera taken a long roll of negatives on stripping film at the rate of from three to five in a second, and so secured various phases of motion. The mechanism of the camera was shown, and Mr. Varley explained that the tendency of a roll to hang loose was overcome by differential speed of the two spools. There was also a small roller, which, being thrown against the film at each movement, both helped in keeping it taut, and prevented it from running to one or the other end of the roller.

It was announced that the next technical meeting of the Society would be held in the Exhibition Gallery on the fourth Tuesday in October, and that on that occasion the apparatus would be shown and explained.

The London and Provincial Photographic Association.

September 25th.—Mr. J. W. Atkins in the chair.

Mr. F. A. Bridge, referring to repeating flash-light lamps, gave particulars of a serious accident that had recently happened to a member of the Photographic Club whilst photographing a party of children assembled at his house. Hibbard's repeating lamp was being used, when an explosion took place, causing considerable damage to the furniture, but fortunately without injury to anyone present. The lamp was blown to pieces, leaving only its nozzle. The powder used was sold with the lamp.

Several members expressed an opinion that a highly explosive ingredient must have been mixed with the compound sold.

An exhibition of prints was given by members who had attended the outing on the previous Saturday at Hampstead Heath, Messrs. E. W. Parfitt, W. E. Debenham, T. E. Freshwater, and the chairman each showing silver prints from negatives taken on that occasion.

Mr. Chang exhibited two albums of instantaneous work, consisting of views in the neighbourhood of Arundel and Hampstead Heath.

The Chairman also showed some photographs taken by him at St. Albans and Church Stretton.

In a short discussion that followed on non-actinic light, it was generally agreed that a plate in course of development would, after the image was out, bear a large amount of light without injury.

Bath Photographic Society.

The eighth and last of this season's excursions took place on Thursday, the 25th ult. The party left Old Bond Sreet by brake shortly after two o'clock, for Newton St. Loe. Newton Bridge, from the city side, was the first subject chosen. The sky was overcast, but some fine effects of light and shade were obtainable. Resuming the journey, Saltford was reached within an hour of the start. Here several plates were exposed in the village and at the landing stage. Crossing by the ferry to the Kelston side of the Avon, a short journey on foot brought them to the lock and weirs facing the boating-station, and here a variety of subjects was presented, including pastoral and woodland as well as aquatic. Nearly two hours elapsed ere the ferry-boat was again called into requisition, so loth were the members to leave this most picturesque neighbourhood. The ferry recrossed, a smart drive was next taken to Swinford Weirs, a little distance up the river in a westerly direction, and here the now declining sun, with its attendant long-cast shadows, produced scenic effects of the most charming description. Before sundown the supply of plates became exhausted, and after the party had refreshed themselves at the Jolly Sailors, Swinford, the journey home was made through scenery which it would be difficult to excel. Mr. H. S. P. Wells acted as leader on this occasion, and it may with confidence be said that amateurs visiting Bath cannot do better than follow the example set by the local society. The indoor meetings will be resumed on the 29th inst.

West London Photographic Society.

A special meeting, convened for the purpose of allowing members to see the new premises of the Society, was held at the Lecture Hall, Broadway, Hammersmith, on Friday, 26th. The president, Mr. Chas. Bilton, occupied the chair. The meeting was of an informal character, there being no special business to transact.

The Secretary then exhibited the fusee repeating flash-light lamp, an ingenious and portable piece of apparatus recently introduced by Messrs. Adams & Co. The "Perpetual" shutter, by the same firm, was also shown. The special features of this shutter are, that it requires no setting, and by an arrangement of a pneumatic cushion it can be fitted to lenses of various sizes without the employment of adapters. Negatives, and prints therefrom, taken during the summer, were then handed round and criticised, after which the proceedings terminated.

The annual general meeting takes place on October 10th, at the Broadway Lecture Hall, where all future meetings will be held. Friday, 24th October, will be a lantern night.

North Middlesex Photographic Club.

Monday, Sept. 22nd.—Mr. Lothbridge in the chair.

Mr. Hiscock exhibited several whole-plate prints in platinum, which were very fine; the negatives had been taken on Edwards's isochromatic plates.

Mr. Paul exhibited one of Chadwick's "Eclipse" lantern slide carriers, by which, upon introducing a new slide, it first cut off the light, after which the fresh slide was pushed into position, when the shutter was again withdrawn, and the fresh slide appeared upon the screen. The simplicity with which it worked was especially spoken upon.

Mr. C. Beadle then gave his paper and demonstration of "Lantern Slide Making" (see page 769). The lecturer exposed and developed a lantern slide, also a half-plate transparency, in which the high lights were remarkably clear for a gelatine slide. The exposure was given by the dark-room lamp, which gave a flame of about $1\frac{1}{4}$ inches, and the time 80 seconds, at 6 inches distance from the burner. One slide (the interior of a cathedral) in which the negative from which it was made was badly fogged by halation, was shown round, in which no trace of this fault was visible; this result had been obtained by masking.

Mr. Marchant wished to know which was the better to use for copying, a rapid rectilinear lens or a wide-angle?

Mr. Beadle: It does not matter which, as among those to whom I have recommended my plan are those who use both.

The Secretary: The results would be equally good, the only difference being in the time taken—the rapid rectilinear working at a larger aperture.

At the next meeting, October 13th, Mr. D. P. Rodgers, who has been photographiug in Egypt this summer, will give a lecture entitled, "Pictures of Egyptian Life," illustrated by lantern slides made by himself, and shown by the optical lantern. Visitors invited to attend.

Cardiff Amateur Photographic Society.

Sept. 26th.—Chairman, Mr. S. W. Allen. The chief topic of interest was an intimation from the Free Library Committee that they would be pleased to offer a gold, silver, and bronze medal in connection with the county survey, the same to be open to all the professionals and amateurs of the county; also a silver medal for competition amongst the members of the Society only.

Mr. W. Booth reported that the survey had made satisfactory progress, notwithstanding the bad season.

Hackney Photographic Society.

A meeting was held on Thursday last, when Mr. Beckett presided.

Messrs. Hensler, Gosling, and Dean passed round views they had taken whilst on their holidays.

The Secretary showed "Le Tison Eclair," a flash-lamp of French make; the flash was brought about by magnesium being blown through an ordinary match flame.

After reminding members that the entry forms for exhibition purposes are now ready, the Chairman called on Mr. W. L. Barker for his paper on "Shutters." There were between twenty and thirty different makes of shutters for the lecturer to comment on, which incidentally he did. After mentioning the various positions in which shutters were used, he proceeded to state his opinion that undoubtedly the most correct position for a shutter was between the lenses, as the illumination was more even and shutter was practically faster. He was, moreover, of the opinion that the centre required less lighting than the margins of a picture. He said that the moving part should be extremely light, so that there should be no "kick" or "jump," thereby causing vibration, and advocated the use of a shutter which had no parts to get out of order. He showed his Newman shutter with a pin attached to the central screw, a contrivance he had constructed to tell at a glance whether

the shutter were set or no. If it were, the pin would rest at a given point (indicated). The best position for a shutter on a hand-camera or studio lens was at the back of a leus, as it was then unobtrusive.

The Chairman preferred the ordinary plain drop-shutter, which, he judged roughly, fell at one-tenth of a second. He generally tested a shutter with the aid of a bicycle wheel.

Mr. Barker said he had done so, with the following result :—Newman's, $\frac{1}{80}$ to $\frac{1}{20}$, and the plaiu drop-shutter, $\frac{1}{10}$ second.

Tooting Camera Club.

The first general meeting was held at the High Schools, Church Lane, on the 23rd inst., Mr. J. H. Beckett in the chair.

The rules as drawn up by the committee were read and approved, and the followiug officers were elected for the ensuing year. *President*—Mr. A. H. Anderson ; *Vice-President*—Mr. J. H. Beckett ; *Hon. Treasurer*—Mr. C. Stowell ; *Hon. Secretary*—Mr. G. H. Dollery ; *Committee*—Messrs. W. Irwin, J. F. Child, S. J. Blazdall, and H. Berger.

It was decided that the name of the Society, viz., Tooting Amateur Photographic Society, should be altered to the Tooting Camera Club.

Those desirous of becoming members are requested to communicate with the hon. secretary, G. H. Dollery, Ivythorpe, Vant Road, Tooting Graveney, S.W.

Birmingham Photographic Society.

A meeting was held on September 25th at the Colonnade Hotel, Mr. W. Jerome Harrison, F.G.S., in the chair.

Mr. Pickard gave a report of the Bristol excursion.

Mr. Longmore exhibited some pictures taken in North Wales, and Mr. Leeson some of North Devon, taken with a haud-camera.

Mr. Sershall then gave a paper on "Art in Drawing—Photography," which was listeued to with attention.

Leicester and Leicestershire Photographic Society.

The last excursion for the present seasou was arranged for Friday the 26th inst., when a few workers met in spite of the unpropitious weather, and journeyed to Ashby Castle. After a time the light improved, and a series of most satisfactory exposures was made on the ruins of the ancient structnre, which shows evident signs of the ravages of time and elements. After the plates had been exhausted, the party drove to Hoo Ash, the residence of Mr. Jas. Jones, Ravenstone, who had invited the Society to accept his hospitality, where a sumptuous repast awaited them. The party then recharged slides, and took a walk to the village, where some pretty bits, and the interior and exterior of the old church, afforded ample scope for the exercise of the art. When the light had so far faded as to render photographic work no longer practicable the members returned to Hoo Ash, where the hostess was awaiting them with a welcome tea table.

The Great Yarmouth and Eastern Counties Photographic Society.—At a meeting held on the 24th September, it was decided that a photographic society under the foregoing name be formed, open to amateurs and professionals of both sexes. The following officers were elected :—*President*—Mr. H. D. Arnott ; *Vice-Presidents*—Messrs. Shuttleworth and Price ; *Treasurer*—Mr. John Taylor (National Provincial Bank) ; *Secretary*—Mr. H. Harvey-George, The Tower, Gorlestou ; *Committee*—Messrs. Rumbold, Pechey, Rudd, Hindle, and Blake. It was decided ou the 1st inst. that an opening meeting be held in the Towu Hall on October 8th, when the Mayor will preside, and lantern views lent by the Liverpool Association be exhibited by Mr. C. Rumbold.

Received.—From Messrs. Hazell, Watson, and Viuey, the second edition of "A Dictionary of Photography for the Amateur and Professional Photographer," by E. J. Wall. The compiler says, in his preface to the preseut issue, that "many additions have been made, new formuke incorporated, and to all have been added the metrical equivalent weights."

Answers to Correspondents.

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

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

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

Photargus.—*Liquid Water Colours, Photo Stains.* Without actual knowledge of the particular preparatious mentioned in your letter, which you say will *not* mix with varnish, we can only recommend you to try such aniline colours as are soluble in alcohol. For a green varnish use "brilliant green" or "malachite green," dissolved in warm alcohol, and added in requisite quantity to a white lac or suitable spirit varnish. Films coloured in this way would not resist rain or bear long immersion in water, for the aniliue greeus are themselves soluble both in spirit and water. "Iodine green" is not now procurable, and is so easily decomposed by heat, turning over to Hofmaun's violet.

Northern.—*British Association Handbooks.* We do not know whether the "Handbook for Leeds and Airedale," like that of Bath (1888), is procurable by purchase. The printer's name is given, but there is no uientiou of a publisher. It would be well to apply in the first instance to Mr. H. Stewardson, at the office of the Association, 22, Albemarle Street, W.

R. C.—*Sepia Prints on Rough Paper.* Our illustration of last week—"Richmond Bridge," by Mr. Cembrano—is representative of a new style of art treatment which found expression last year in the works of Colonel Noverre and others, and is admirably shown in the medal pictures of Mr. George Davison and Mr. Lyonel Clark in the present exhibition.

A. M. S.—*The Coupon System.* Three cabinets for half-a-crown may appear cheap, and, by a happy chance, prove successful ; but, according to your own admission, you have to wait your turn, and pose yourselves "to look natural."

Tom is thanked for his long explanatory letter. Having got them you must needs prove them. Do this by wrappiug up some of the mounted photos in several folds of damp blotting-paper, and watch the result for a few days or a week to see whether there is any sign of fading.

Received, the prospectus of the Liverpool Photographic Exhibitiou, 1891. Prizes are offered in twenty-seven classes, on the usual conditions as regards entrance fee. The advice note must be received not later than the 20th January, and exhibits sent in between 2nd and 17th February.

R. M.—*Photographers' Benevolent Association.* The subscriptions for the current year should now be sent either to the treasurer, or to Mr. H. J. Beasley, hon. sec., 66, Chancery Lane, W.C. Several sad cases of distress have lately come up for timely assistance, and there is no doubt that contributious are much needed to meet these pressing demands.

L. T. E.—*Fuming Albumenised Paper.* One method is to fumigate with ammonia the felt pads about to be employed iu the printing frames ; another is to hang the dry seusitised paper in a box or closed chamber, with a shallow dish of strong ammonia placed at the bottom.

P. A.—*Original Ross Lenses.* If your lens has "A. Ross" marked upon it there is a probability of its being spurious, for the late Andrew Ross put out a notice warning his friends that he used his surname only—"Ross, London"—to desiguate his own manufacture.

E. Lyell.—*Camera Club.* The works of Mrs. Cameron were long since withdrawn from Bedford Street, and those of Mr. Lyd. Sawyer, of Newcastle-on-Tyne, are about to be shown ; see notice in the News of 12th ult.

M. P.—*Broken Dry Plates.* One in a dozen is a large proportion to meet with, and you ought to get compensation upon returning the unused (fractured) plates. With careful packing the loss should be very small.

Received.—E. and S., F. C., and Enamel.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE DIAZOTYPE OR PRIMULINE PROCESS.

THE chief novelty in the Photographic Exhibition consists of a few specimens of work executed on paper, cotton-cloth, velvet, and other fabrics, by what Messrs. Green, Cross, and Bevan, the inventors, call the diazotype process. Of this process we gave a full description a few weeks ago, and for the first time in photographic journalism, at the close of the meeting of the British Association at Leeds.

There is some possibility of this process becoming for a time a fashionable "craze," because it is easy as well as expeditious, and a lady may take any white fabric and print upon it designs to suit her own taste; pressed leaves would serve instead of a transparency for the production of many an artistic design. By the use of transparencies to print from, it would not take long to produce a curtain covered with the portraits of all the members and the friends of the family; such a curtain, it is true, would be likely to be of interest more from its novelty than its æsthetic merits.

At a meeting of the Photographic Society, Mr. Green recently printed different leaf-patterns upon different parts of a piece of white cotton cloth; next he developed the several patterns with various developers by applying each of the latter locally with a brush; the result was a pretty series of designs in variegated colours upon one piece of cloth. The colours at present obtainable by the use of different developers in the process are red, orange, purple, and maroon; by mixing the purple and orange developers, an unsatisfactory kind of approach to green has been obtained. Developers to yield blues and greens with this process have yet to be discovered.

A story is told that one of the coal-tar greens was first obtained in the following way. A chemist had discovered a new red coal-tar dye, but it was fugitive. He asked a local photographer if he could suggest a way to fix it, and the latter replied that, so far as his experience went, "hypo" would fix anything. The chemist tried it and found that it produced a beautiful green dye. May Messrs. Green, Cross, and Bevan be equally happy in their experiments.

All the diazotype prints have at present a yellow ground. Mr. Green holds the idea that the way to avoid this is to try to prevent its formation, not to produce it first and try to discharge it from the fabric afterwards. His efforts have been partially successful, for he exhibited a piece of silk with coloured designs photographed upon it, and the ground was nearly white; it was of about the colour of cream.

In the diazotype process, what is called "developing" might almost as well be called "colouration," for the image is previously visible nearly, if not quite, to its full extent. Assuming a really invisible image to be impressed in the first instance on the sensitive compound, the discovery of a suitable developer therefor would quicken the present process, and render the camera more available; it might also form the foundation of a new branch of camera photography with organic salts free from silver.

The inventors describe diazotype printing as a "positive" process based upon the fact that the diazo derivatives of a newly-discovered group of coal-tar colouring matters, known under the name of primuline, are extremely sensitive to light, and therefore rapidly decompose on exposure. They say that the diazo compounds react with a variety of coal-tar derivatives—phenols and amines—to form colouring matters of very rich shades; when decomposed by light, this property is entirely lost in the product of decomposition, which is an inert substance. After exposing a surface sensitive with the diazo compound to the graduated action of light, such as results from the varying tones of a positive, the destruction of the diazo compound is found to have taken place in exact proportion, and the subsequent development produces a coloured picture with an accurate reproduction of the details of the original. In the fully discharged portions, the high lights, the colour is the neutral tint of the product of decomposition of the diazo compound.

Papers on this subject, with demonstrations, are to be read hereafter before the Society of Arts and the Camera Club. A medal for photographs produced by this process has just been awarded by the Photographic Society of Great Britain.

AN AID TO DAYLIGHT.

The time of year is now approaching when every photographer, be he professional or amateur, will be greedily crying out for "more light," for the days are darkening, and studios are beginning to look dull and gloomy in spite of their transparent walls and roofs. The average sitter has heard and read so much about instantaneous photographs, and has probably seen so many pictures of express trains, seagulls, and lightning, that, as he enters the photographer's premises, he is apt to expect a little too much in the way of instantaneity. "If," he perhaps argues to himself, "an express train a couple of hundred yards long can be taken in the two-hundred-and-fortieth part of a second, in how much less time should a comparatively small object, such as myself, be photographed?" The question looks almost like one of those arithmetical problems which are invented to tease and worry students at competitive examinations, and bears still further resemblance to them in its utter absence of common sense and probability. But it is put forward here as the kind of argument which would be used by one who was quite ignorant of the part which light plays in the production of a picture. To the untrained eye, the sunlight of autumn is as bright as that of early summer, and it is only the man who has to deal with it, and coax it into doing certain work, who knows how much its brightness diminishes as the year grows old. It is therefore necessary to take advantage of any means which presents itself of adding to the amount of light available, and there is no doubt that this can be done by the judicious use of magnesium powder.

The quantity of this metal sold in winter time by the photographic dealers alone must be enormous, and it is principally used by amateurs for photographing at night. But we would now advocate its use by professional workers, not only as their sheet anchor for evening photography, but as an auxiliary for daylight operations with the camera. No such help is, of course, needed by those who have their studios fitted with the electric light, and who habitually shut out daylight from their premises as a thing which is far too fickle to be regarded as a reliable assistant. But to those who depend on daylight—and more especially those whose studios are so situated that, although they have enough light early in the year, they suffer for want of it in the autumn—magnesium offers a ready means of overcoming their difficulties.

If all the sitters were of that cast-iron type familiar to photographers—we mean the man who will sit down, fix his head against the rest, and remain immovable for any time required—everything would be easy for the proprietor, and work would go on from morning to night with the sweetest regularity. But, unfortunately, the majority of people are differently constituted, the adults possessing *nerves* which prevent them keeping quiet for more than two or three seconds at a stretch, and the infants possessing tempers and other infirmities which prevent them ever keeping quiet at all. It is for the treatment of this class of patients that the metal magnesium is so valuable when used as an adjunct to daylight in shortening the necessary exposure. A few photographers have adopted the plan, and have spoken in high terms regarding its advantages, some going so far as to say that they have taken certain large negatives of babies which would have been simply impossible without such aid.

We believe that many photographers have been prejudiced against the use of the flash-light from having seen some of the pictures taken by its aid, and it must be confessed that a great many of these are of the most ghastly description. The fault is, in most cases, due to dependence being placed on one flash-lamp only, by which all the shadows are exaggerated, and the lights made painfully dense. The best results are obtained when three or four lamps are included in one circuit, that circuit not being a metallic conductor, as in the case of electric illumination, but an air-tube which will operate the lamps instantaneously by the pressure of one large pneumatic ball. Such lamps and fittings are now obtainable at a very low price, with movable stands upon which the lamps can be placed to the best advantage.

With regard to the best form of lamp for burning the metal, we should choose one of those in which the pure powder is driven through a spirit flame, in preference to the use of any pyrotechnic mixture of which the powdered metal forms only a part. Used in this way, by itself, it is safe, but when we begin to experiment with powders of unknown composition, and probably containing such quarrelsome ingredients as sulphur preparations and chlorate of potash, we are on dangerous ground. Besides, these mixtures are apt to deteriorate with keeping, and become inefficient in their action. The use of the magnesium flash in daylight does not startle the sitter as a flash of similar intensity will do at night, and therefore the daylight worker need not fear that his sitters will have that unnatural appearance so often seen in flash-light pictures.

*** *Those friends who have not yet sent in their* Year-Book *articles, are respectfully requested to send them without delay.*

Advice to Amateurs.—In every photographic operation care and deliberation are above all things necessary. The beginner should confine himself to one branch at a time, and, until he has learned by experience what deviations can be made from them with safety, should adhere absolutely to the instructions given. As he advances he is sure—and it ought to be so—to deviate in small matters from any written instructions which can be given him; but he will always find that careful and cleanly working is a necessity if good results are required. Above all, let him endeavour to avoid making the mere technicalities of his photographic work an object, instead of letting them be but a means to an end. Let him try at all times to produce pictures which will be a credit not only to himself, but to the art by which they are produced, bearing in mind that if photography is not ranked by all as one of the fine arts, it is rather because it is practised by so many who have not any artistic feeling, or will not take the trouble to acquire any artistic knowledge, than because it is incapable of producing true works of art.—*Marion's Guide to Photography.*

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

No mention was made last week of the medal awarded to Mr. W. J. Byrne, as it seemed to be more convenient to deal with the matter in connection with other examples of portraiture in the gallery. Portraiture has, year by year, been occupying a minor position in comparison with landscape work. This year there are less examples than usual, and it cannot be said that any single specimen shows a distinct advance. The fact is, photographers have gained a mastery over their materials in respect to portraiture, and as the professional photographer has of late depended so much upon the retoucher's "artful aid," one can well understand his reluctance to exhibit his productions. The exhibits in the direction of portraiture must mainly depend upon the professional. He has all the appliances in the way of apparatus; he has a perfectly lighted studio, and really, there is no world left for him to conquer. Mr. Byrne, who figures as the most important exhibitor of portraits, depends for attraction upon the fact that the pictures shown are not taken at his studio. I am not sure that they are any more interesting on this account, because it is now fully recognised that an ordinary room, in skilful hands, will give even better results than the studio, simply for the reason that they are not quite so conventional. "Dr. W. K. Selle" (No. 441) figures as the medal picture. He also appears in a series of pictures on the screen. There is little in the medal picture calling for comment. It "presents no mark to the foeman." Its manipulation is perfect, as it always is in Mr. Byrne's work, and that is the most which can be said for it. We have now grown out of mere admiration for a portrait because of the skill of the photographer; we look, rather, to the model, and desire to forget the manipulation.

In Mr. Mendelssohn's pictures there is much to admire, because he has been so very fortunate in his sitters. Some of them might really be taken as types of English beauty. Apart from this, his work is orthodox in treatment, and perhaps the captious critic might say a little akin to the show-case picture, but this quality is difficult for the professional photographer to avoid, and I find no fault with Mr. Mendelssohn's work on this account.

Some of the so-called studies in the Exhibition might almost rank as portraits; indeed, it is often difficult to determine where the portrait ends and the study begins. The distinction sometimes seems to be the insertion of the name in the first case, and the putting on of a fancy costume in the second. Mrs. W. P. Arnot shows some very excellent work, evincing much taste in the arrangement of drapery. If "a study" means something which is somewhat cold and academic, then Mrs. Arnot is to be highly praised, as all her pictures are well thought out, if somewhat unimpressive.

Mr. H. Stevens, I do not think, is up to his usual standard. It is difficult to understand why he chose such an unprepossessing model as No. 172. The misfortune is that she has irregular teeth, and Mr. Stevens has elected to take her with her mouth expanded into a smile. The same face appears in No. 305, with all her defects intensified. I am afraid that tiresome person to please, the general public, will see little to admire in Mr. Stevens' pictures this year. He affects a monotonous, out-of-focus aspect, and the prints are of a corpse-like hue. The tone of a photograph, and probably a type of beauty, are matters of taste, and I may be totally wrong.

Mr E. Resta shows some admirable portraits of children, as he has done on former occasions; but, skilful as he is, he is far distanced by Mr. Robert Faulkner's exquisite work—work which will be looked at with a melancholy interest. Both Nos. 156 and 408 show all the old feeling, tenderness, grace, and delicacy. So far as one's knowledge goes, there is no one to take Mr. Faulkner's place.

Mr. Harold Baker shows some careful pictures, but his work, on the whole, is not so notable as in former exhibitions. One of the best subjects, on the borderland between a study and a portrait, is Mr. Arthur Burchett's "La Belle Bretonne" (No. 279). It is simple in pose and pleasing in expression. It nowhere oversteps the modesty of nature, and fairly accurately gnages the photographic limit in regard to what used to be called "fancy" pictures. The stumbling block in the way of imagination, when a photograph which is supposed to tell a story is presented to you, is that you cannot get rid of the means by which the picture is produced. The posing of the model, the building up of the accessories, even the manipulation of the dark room, are too obtrusive. When a photographer makes one forget these things, he has accomplished much. Hence, in regard to this class of photograph, one might adapt a well-known saying, and exclaim, "Simplicity, simplicity, always simplicity!" Mr. Burchett is, clearly, convinced of this.

I cannot say I care much for Mr. Walter R. Cassell's portrait studies. His "Three Heads" (No. 12) are not beautiful, nor does Miss Calhoun as "Vashté Dethie" (No. 280) extort admiration. The somewhat repellant aspect of the pictures as a whole is assisted by the unbroken background which Mr. Cassell has chosen.

It is not quite certain whether Mr. Byrne intends No. 317 to represent Moses as a child, or a child as Moses; but the public can take their choice. Of course the photography is perfect.

Mr. Ralph Robinson gives us a second series of the admirable portraits of the Royal Academicians which gained a medal last year. They are all intensely interesting, and are really of national value. Mr. Robinson is to be congratulated on the uniform success which has attended what must have been a very trying undertaking.

Mr. Barry's portraits (Nos. 351 and 352) suffer from a sombreness of effect; while his picture of the "Misses Hamilton" (No. 429) is somewhat diffused in the composition; otherwise there is much in his work that is meritorious. Miss Florence Harvey's "Dutch Fishing Folk" (No. 436) is an excellent piece of work. It is out of the beaten track, and keeps well within the range of the possible. Mr. John Collier exhibits an admirable portrait of Cardinal Newman, and Messrs. Window and Grove show some portraits distinguished for delicacy of detail, a portrait of a nobleman being particularly good.

Mr. Lyonel Clark's portrait studies will inevitably excite considerable comment. I should be inclined to regard them as experiments, rather than as exemplifying Mr. Clark's ideal. Nos. 460 and 462 are the best; No. 461 is distinctly ugly. It may have its value as a specimen of equality of focus—or, to speak properly, equality of no focus—but as a counterfeit presentment of the human face divine, one would rather not look at it. It is instructive to stand by the pictures and listen to the comments of the spectators. Mr. Lyonel Clark fairly puzzles them. Sometimes it is said, "These are copies of paintings"; one critic hazarding the suggestion that the original must have

been in process of restoration. Mr. Clark, of course, expects to be keenly criticised over his new departure. What is to be feared is the risk of imitators. The out-of-focus picture *does* offer such an excuse for careless work.

Mr. Henry Stevens' photographs of well-known models (Nos. 470 and 482) are in some respects superior to his other pictures, but suffer from their inkiness of tone. On the screen are some portrait exhibits by Mr. Alfred Warner and Mr. Edgar Scammell, which, however, do not call for any particular comment. WIDE-ANGLE.

THE CAMERA CLUB NEW SESSION.

THE new session of the Camera Club began last Monday night, when Mr. Francis Cobb, who presided, said that they had met that evening to inaugurate another session, and that they were doing it with another "one-man exhibition." On that occasion the "man" was Mr. Lyddell Sawyer, who, he regretted to say, was unable to be present that evening. The photographs upon the walls, especially the views of Newcastle to the left upon entering the room, were samples of works of art. Some of his pictures had also been taken in the style of Mr. H. P. Robinson. The room in which they had assembled that evening was small as compared with that which they hoped to use hereafter, for they would occupy their new building as soon as possible, and the Furniture Committee was busy with its preparations. Their contractor, although he had not been able to carry out all he promised, had been doing his best. The County Council had caused trouble and delay. Although the Club had once hoped to be in its new premises by Christmas, he was afraid it could not do that; the noble British workman, in fact, was master of the situation. The contractor said that if he "cut up rough" with his men and tried to make them go on faster, they might "cut up rough" with him, and do no work at all. He hoped that the Club would get into its new premises by January or February next. Meanwhile, the workmen might be allowed to go on in their quiet, sedate way, in order that the building may get dry before it is required for use. When they saw the new concert room, they would say that it was better than the one in which they were then listening to him. The Club itself was getting on well, and the proportion of town to country members was growing larger than ever before; the proportion now on the notice board stands at eight to one.

A smoking concert followed the above remarks.

NEWCASTLE ON TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.—The next meeting will be held in the Mosley Street Café, Newcastle, on Tuesday, the 14th inst., at 7.30 p.m.

LECTURES ON PHOTOGRAPHY.—Mr. T. C. Hepworth, F.C.S., commences a course of practical lectures on photography at the Birkbeck Institution on Saturday next. The lectures take place weekly at six o'clock, and are sure to attract many beginners, as well as those who wish to perfect themselves in different branches of photography.

IT is often required to obtain a good grey tone for bromide prints, and M. Senior, in the *Photographische Mittheilungen*, recommends for this purpose that the bromide be altered to chloride by the employment of a solution of chlorine (chlorine water), which should be followed by redevelopment of the print. This redevelopment should be with either pyro or oxalate restrained with a goodly amount of bromide. If a red tone is desired it may be obtained by the addition of potassium bromide in the proportion of 4 parts to 100 parts of the developer.

ON SULPHITES, THEIR STABILITY AND PRESERVATION.*

BY JOSEPH C. BELCHER.

WHEN we burn a piece of sulphur in air or oxygen, there is formed a suffocating gas of a sharp, penetrating odour; freely soluble when brought in contact with water, producing what is known to chemists as a solution of sulphur*ous* acid, according to the following equation:—

$$\underbrace{S}_{\text{Sulphur}} + \underbrace{O_2}_{\text{Oxygen}} + \underbrace{H_2O}_{\text{Water}} = \underbrace{H_2SO_3}_{\text{Sulphurous Acid.}}$$

Now, although sulphurous acid (H_2SO_3) is the principal body formed, yet some is carried a stage further in oxidation, resulting in the production of traces of sulphur*ic* acid (H_2SO_4) which always accompany sulphurous acid prepared by burning sulphur in air or oxygen, and dissolving the resultant products in water. This aqueous solution of sulphurous acid is very unstable, and, when exposed to free access of air, is gradually converted into the more stable and permanent body, sulphur*ic* acid, or what is commonly known as oil of vitriol.

The facility with which sulphurous acid combines with an additional atom of oxygen is a property also true to a greater or less extent of its salts (sulphites). [Here sulphur was burnt in a bottle containing air, and the gaseous product shaken with water.] The presence of sulphur*ic* acid was clearly demonstrated by the following experiments:—

1. With a little of the water from the bottle in which the sulphur had been burnt, the formula "H_2SO_4" was written on a piece of blotting-paper, and warmed over a spirit lamp, when the presence of sulphuric acid was rendered evident by the formula being charred upon the paper.

2. It was shown that a precipitate of sulph*ite* of barium was soluble in a solution acidified with hydrochloric acid, but sulph*ate* of barium was not. The presence of sulphuric acid in the liquid, from the bottle in which the sulphur had been burnt, was then demonstrated by acidifying a portion of the latter with hydrochloric acid, and adding barium chloride, when a precipitate of barium sulphate was produced.

When sulphur dioxide (SO_2) is brought in contact with nascent hydrogen, this latter body is oxidised with formation of water, by combining with the oxygen of the first-mentioned body, whilst the sulphur combines with hydrogen, forming sulphuretted hydrogen, thus:—

$$\underbrace{SO_2}_{\text{Sulphur Dioxide}} + \underbrace{3H_2}_{\text{Hydrogen}} = \underbrace{H_2S}_{\text{Sulphurett d Hydrogen}} + \underbrace{2H_2O}_{\text{Water.}}$$

This is an instance of a reducing agent becoming an oxidizing one. All bodies capable of evolving SO_2 under the circumstances stated (hyposulphites, &c.) give this reaction, but we are at present only considering sulph*ites* which are detected by this reaction, even if present in very minute quantities; for if we allow the sulphuretted hydrogen produced to impinge on a piece of filter paper soaked in lead acetate, it is immediately turned brownish-black or black, from the formation of lead sulphide. Sulph*ates* do *not* give this reaction. [Here the experiment was shown by adding a little sodium sulph*ite* to a test tube in which hydrogen was evolved from pure zinc and hydrochloric acid.] A solution of iodine is decolourised by sulphur dioxide, a reaction which also enables us to detect minute quantities of the latter.

Sulphurous acid is a bi-basic acid—*i.e.*, it contains two

* Lecture delivered before the London and Provincial Photographic Association.

atoms of replaceable hydrogen; when one atom is displaced by a monad element we have a *hydrogen* or acid salt produced; when two atoms are displaced we have a normal, or what is commonly called neutral salt. Of those salts of sulphurous acid which are soluble in water, we have the acid sulphites of barium, strontium, calcium, and magnesium, and the neutral and acid sulphites of lithium, sodium, potassium, and ammonium. Most other sulphites are insoluble.

The sulphites of sodium and potassium are mostly used by photographers, especially the former, of which there are four in number: (1) normal or neutral sulphite, Na_2SO_3+7Aq; (2) the acid or bi-sulphite, $NaHSO_3$; (3) meta-sulphite, $Na_2S_2O_5$, or $Na_2SO_3.SO_2$; (4) sesqui-sulphite, $Na_2SO_32NaHSO_3+nAq$; this latter discovered by Mr. J. B. Giles, F.I.C.

The neutral sulphite of sodium of commerce is prepared by saturating the carbonate in solution with sulphurous acid, and adding to it, while warm, as much sodium carbonate as it originally contained; consequently, through carelessness in manufacture, many samples show a large excess of the latter, and although the sulphite crystallises better from a solution containing a small quantity of sodium carbonate, still, in a carefully manufactured sample, this should never exceed 1 or 2 per cent. A pure salt of this description is manufactured by Messrs. A. Boake, Roberts, and Company, of Stratford, E.; also a "special photographic salt" and alkaline meta-sulphites. I am requested to mention that these sulphites are patent articles, and can only be obtained from or through this firm. By their kindness I am able to show you these fine specimens of sulphite and meta-sulphite. [Here the specimens were exhibited, the lecturer dilating upon their great purity, and recommending them as standard articles in preference to making allowances in the commercially impure samples.]

The presence of an excess of sodium carbonate in the sulphite causes great annoyance to photographers, as, by its varying amount, they are unable to make any allowance in their formula, which demands an addition of a definite amount of the former in conjunction with the latter for developing. The presence of carbonate in sulphite of sodium is easily detected. The method depends upon the fact that carbonic acid gives a beautiful red colour with an alcoholic solution of phenolphthalein, whilst sulphurous acid produces no action in this respect. [Here the experiment was shown.]

If, then, we dissolve some of the sulphite above referred to containing only 1 or 2 per cent. of carbonate, add a little alcoholic phenolphthalein, we have a red colour developed due to the carbonic acid, and, on adding carefully a solution of the meta-sulphite—preferably potassium meta-sulphite, as this crystallises much more freely than the sodium salt, and is more stable—till the colour just disappears, the result is a pure solution of neutral or normal sodium (potassium) sulphite, the SO_2 radical combining with the sodium which was previously combined with the CO_2 radical. The question, therefore, of obtaining a pure solution of normal or neutral sulphite of sodium need no longer perplex photographers.

I pointed out in the first part of my lecture that sulphurous acid gradually became oxidised to sulphu*ric* acid, and that sulph*ites* oxidised more or less rapidly to sulphates, which latter, of course, affects the purity of the salts when stored; and I suggest, as a means of preservation, that a pure sample, such as that referred to, and manufactured by Messrs. A. Boake, Roberts, & Co., should be kept in well-stoppered bottles with the crystals covered with pure ether, which procedure, I am of opinion, would prevent oxidation; the ether being very volatile, when the crystals were wanted they could be removed from the bottle and placed upon blotting-paper till they became dry preparatory to dissolving. [Here crystals were shown in support of this, which had been kept under ether for six months.]

To summarise: I have pointed out (1) that the sulphites oxidise more or less rapidly, forming sulphates, and (2) have suggested a means of preserving by keeping the crystals below the surface of ether; (3) I have mentioned and demonstrated simple tests within the capability of any photographer to perform for recognising the presence of sulphates and sulphites, and the detection of carbonate in the latter; and, lastly, by the use of the meta-sulphite, how to obtain a pure solution of the neutral or normal sulphite.

In conclusion, I desire to acknowledge my thanks to Professor Lewes, Royal Naval College, for the loan of his apparatus, which has enabled me to illustrate these experiments, and to sincerely thank my friend, Mr. Haddon, for suggesting the subject of this lecture, which has given me such pleasure to deliver to you this evening, and your very kind attention and manner in which you have received me. I particularly wish to acknowledge my indebtedness and thanks to Mr. J. B. Giles, F.I.C., for much information given me concerning the sulphites manufactured by Messrs. A. Boake, Roberts, & Co., whom I have also to thank for their courtesy and kindness in supplying the two specimens of sulphites.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

CONVENTION OF GERMAN AMATEUR PHOTOGRAPHERS—GOOD NEWS ABOUT EIKONOGEN—THE "THULA" DIRECT PRINTING PAPER—DEVELOPING ENLARGEMENTS ON BROMIDE PAPER.

Convention of German Amateur Photographers at Berlin.—Last week a Convention of Amateur Photographers was held at Berlin. At the official welcome, which took place in the large hall of the Zoological Garden, amateurs from all parts of Germany were present. The *Correspondenz Verein* was represented by its chairman, Mr. M. Allihn, of Athenstedt; the Amateur Photographic Society of Kiel by Dr. Karsten and Dr. Spener; the Dresden Amateur Photographic Association by Messrs. Ernemann, Rauscher, and Bernhart; the Breslau Photographic Society by Dr. Kunisch, and so on. The opening address was delivered by Prof. H. W. Vogel. With the Convention, an exhibition of photographs and photographic instruments was combined, which was also accessible to the public. Many of the photographs exhibited were of high perfection. The well-known traveller, Dr. Paul Ehrenreich, showed a series of highly interesting views; E. Vogel, jun., instantaneous photographs taken in Italy; Captain von Westernhagen contributed a number of portrait studies; A. Halwas, a series of photographs showing scenes of the last large military manœuvres; O. Marquardt showed animal studies executed at the Berlin Zoological Garden, and views of the sea-shore at Ostend. J. Standigl, an amateur photographer of high ability, and formerly an opera-singer, exhibited a series of beautiful collotypes, printed by himself on the hand-press. An interior of

great merit was shown by M. Trene, member of the German Society of Amateur Photographers, who carried off the first prize offered by this society for the best interior. The second prize had been offered to Dr. Witt, for a beautifully lighted photograph of the hall of the University of Marburg; this picture was also exhibited. Among cameras, there were instruments of the detective type by Dirschau and Co., and C. P. Goerz, of Thöneberg, which firm had also a good selection of its wares, including the "Anschütz" instantaneous camera, of which it is the sole maker. Many other specimens of excellent apparatus were shown in this department of the exhibition, which was much frequented. On Monday morning, September 29th, the members of the Convention met at the Photochemical Laboratory of the Technical High School of Charlottenburgh. Prof. Vogel and Dr. Schultz-Henecke received the members, showing them first the exhibits of the various photographic and photo-mechanical processes, which had been arranged in the large corridor, then leading them to the auditory, where a paper was read by Prof. Vogel, on "The Action of Coloured Light on the Eye, and on the Sensitive Film," which was illustrated by many interesting experiments. Various photographic processes—as, for instance, the carbon process, platinotype, and collotype—were then demonstrated practically. At the evening meeting Captain Mensing took the chair, and after an opening address, which was delivered by the Chairman, Mr. M. Allihn, of Athenstedt, read a paper on "Tourists' Cameras and their Construction." Papers were then read by Dr. Miethe on "Photographic Optics," by M. Gaedicke on "A New Flash-light Lamp," and by Dr. Jeserich on "Juridical Photography," illustrated by a large number of highly interesting lantern slides. On Tuesday evening the Convention met at the Hall of the Zoological Garden. Business matters were first discussed. By a number of amateur photographic societies the wish for a closer mutual relation was mentioned. Besides the societies which were represented at the Convention—namely, the Postal Photographic Club, *Correspondenz Verein*, and the societies of Kiel, Breslau, Brunswick, and Dresden—the Amateur Photographic Societies of Munich and Königsberg also declared for the union. The elected committee was charged to take the required additional measures for the foundation of the new Association; the members of this committee are Prof. Vogel, Dr. Jeserich, Dr. Schultz-Henecke, Dr. Miethe, Prof. Roese, and M. Kirchner. After some further discussion, a paper was read by Dr. Dubois-Reymond on "An Air-tight Developing Vessel," and another by Dr. Witt, on "An Actinometer with Pendulum and Blue-Sensitive Bromide Paper." On Wednesday, September 30th, an excursion was made to the Havel Seas and Potsdam, and a large number of negatives was taken on this occasion. In the evening the Convention closed with a banquet.

Good News about Eikonogen.—A circular has just been sent round by Dr. Krügener, of Bockenheim, by which it is announced that the manufacturers of eikonogen have succeeded in finding a means of entirely preventing this substance from becoming brown and decomposed. The body by the aid of which the eikonogen is rendered permanent is as yet kept secret; it is only stated in the circular that a small quantity of a preserving substance is added, and that the eikonogen will in future be manufactured in the form of a white, absolutely permanent powder, for the use of which as a developing agent the formulæ remain the same as hitherto. This improvement will no doubt be welcomed by all those who have tried the eikonogen developer, and appreciate its valuable qualities.

The "Thula" Direct Printing Paper.—I have been favoured by the firm of Dr. Adolf Hesekiel and Co., of Berlin, with a sample of its new direct printing paper. It is generally known that the price of platinum is still advancing, and that in all probability it will continue to do so. With regard to this fact, Dr. Hesekiel tries to make the platinum process cheaper by using the platinum salt only as a toning agent—*i.e.*, by printing on his specially prepared ready-sensitized paper, and toning it with a solution of potassium chloroplatinite. The silver picture is thereby transformed into a platinum print by substitution. The process is the same as in silver printing. The prepared paper is with its slightly yellowish surface placed against the negative, and is printed deeper than is required when the picture is finished. It is then thoroughly washed, and toned in the platinum toning bath until the print shows, if examined by transmitted light, the well-known greyish-black, copper engraving tone. The print is then well rinsed, and fixed in the same way as ordinary silver prints. The prints obtained are, provided that a good negative was used, of beautiful tones, and of great detail and depth. As will be known, the ordinary silvered albumen paper, if treated with the platinum toning bath, gives with difficulty agreeable tones; the new paper prepared by Dr. Hesekiel will therefore prove useful, inasmuch as its treatment differs in no way from that of the ordinary silvered albumen paper.*

Developing Enlargements on Bromide Paper.—Dr. Miethe, in one of the recent numbers of his journal, gives an extensive and excellent description of the enlarging process with bromide papers. In order to obtain a purely black tone, he recommends a ferrous oxalate developer of the following composition:—

Solution A.

Sulphate of iron	100 grammes
Water	350 to 400 c.c.
Tartaric acid...	3 grammes

Solution B.

Potassium oxalate	300 grammes
Water	1200 c.c.

Just before use are mixed—

Solution B	100 c.c.
Solution A	25 ,,
Old developing solution	20 to 60 ,,

If the print comes out rapidly the solution should always be diluted with old developer, never with water, the latter tending to produce greenish flat prints. Dr. Witt recommends for the same purpose the following eikonogen developer:—

Solution A.

Eikonogen	8 grammes
Bisulphite lye	10 c.c.
Sodium sulphite	10 grammes
Water	400 c.c.

Solution B.

Potassium carbonate	35 grammes
Water	400 c.c.

Solutions A and B are mixed in equal parts.

*We know of no tabulated experimental evidence that silver prints toned with platinum are more permanent than those toned with gold. In both cases it seems to be largely an action upon the surface of the silver only. Mr. Lyonel Clark long since used chloroplatinite of potassium for toning.—Ed.

MR. LYDDELL SAWYER'S PICTURES AT THE CAMERA CLUB.

However premature from an art point of view a system of one-man exhibitions in photography may be held to be, it cannot be said that Mr. Lyddell Sawyer's collection is the least interesting of the series that has been given at the Camera Club. If some may consider it the most unequal, this may be traced to the presence of some very early work and portraiture in which Mr. Sawyer has shown his whole hand and the history of his development. There are very few photographers who could make a "one-man" exhibition of more than twenty prints which should, in any critical sense, pass as works of art. Mr. Sawyer is not an exception, and it would be largely stretching a severe test if that number were selected from this exhibition to be included in such a category. The tendency in such exhibitions is to show too many photographs, some, possibly, in every department of work that has been touched. This, from the point of view of the aim of these exhibitions, is a mistake, and one which is unpleasantly paid for by the artist being subjected to a frequent and irritating expression of criticism from "candid friends." There are hardships for any exhibitor in making a "one-man" exhibition of himself. The general defects of style or treatment, and any looseness of artistic principle which may be present, are shown prominently when a photographer lays bare his whole portfolio. He must be prepared, amidst some appreciative but indiscriminating criticism, to have all these little crudities and greater shortcomings laid bare unfeelingly. Every defect thus picked out by smart young investigators with microscopes or with naturalistic spectacles, is freely fathered by the larger body of geniuses whose talent is latent, and who dearly love a ready-made opinion with which to impress others and pose as *connoisseurs*. Such an exhibition invites criticism, and certainly gets it. This is as it should be in a series which purports to show the best that has, up to the present, been done by photography. As a rule, however, it is only the pleasant things which command publication.

Looking at the exhibition as it stands, it might have been fairer to the exhibitor if all which are clearly juvenile productions had been arranged in one dark corner by themselves. However, these are easily singled out, showing, as they might be expected to do, the most rudimentary crudities, and all in that class of story-telling work in which Mr. Sawyer has been least happy. He would, perhaps, have been better advised to have left out all these early attempts, and in addition all his portraiture, and have confined himself to that excellent vein of work of an original character which he has struck occasionally in the course of his practice during the last two or three years. As it is, it must be confessed the exhibition is made up of very unequal material, and it is very doubtful whether the artistic character of the exhibition should have been sacrificed to the idea of showing the gradual growth and progress of the artist. However, this arrangement, whilst it detracts from the show as an art exhibition, adds considerably to its personal interest. Here development can be traced from early efforts, devoid of any style, when the mere processes were all the pleasure and the difficulty. Then we have a series of heavy silver prints, some of them badly painted on, in which there has been a struggle to find expression rather by the aid of some one else's ideas, for these particular photographs are in somewhat feeble imitation of Mr. H. P. Robinson, and consist of crude, lumpy prints in which small figures are doing funny things unnaturally in largish, uninteresting landscapes. Amongst these are "Come Along, Grandad!" "The Good Samaritan," "The Sisters"—a production almost offensive in its crudity and bad mimicry of a pathetic incident—and several others of the same class. It would, perhaps, have been hardly fair to refer to these defective early studies, but that very much the same mistakes have been continued in one class of Mr. Sawyer's work right down to the present time. In the present Pall Mall Exhibition, the picture entitled "Two's Company," upon which a medal appears to have accidentally fallen, is simply a travesty of human nature as unnatural as it is possible to be. It is, of course, only a piece of comic fooling to which any of us, with nothing better to do, might lend ourselves for the amusement of a pretty cousin. The subject itself is not one for any serious art, but, even taking it as it stands, the details are of the most incongruous and imperfect kind.

Of the same kind are "In the Moonlight," a painted photograph, one of the results of the painter's art being to give the figures unpleasantly distorted features, and others not quite so objectionable in treatment, are "In the Twilight" (called last year "Dangerous Company)," "Love's Young Dream," and "How Happy could I be with Either." There is yet another class of subject treated by Mr. Sawyer, in which he has with great pains, as far as can be seen, arranged his studio for certain figure and group studies, such as "She Stoops to Conquer," "The Amateurs," "At Home," "Time to get up," "Bachelors' Quarters," and the like, some of them intentionally amusing, but all weak and unprofitable from an artistic point of view. Mr. Sawyer has evidently yet to learn fully what naturalness means, and that this quality is essential to any picture to be accepted as good art. He would be well advised to abstain from these made-up subjects, leaving this class of things to illustrations for popular magazines. If he *must* depict human nature, let him take it as it is found in its proper habitat. It is a mistake to publicly exhibit bits of badly done theatrical tomfoolery. He should rather seek to express something of the life of the class or individual he is depicting which may be of interest beyond to-day, as he has sought to do in the excellent subjects gathered from the dark ways of Newcastle-on-Tyne.

It is a relief to pass from the photographs we have named to the pictures he has given us, such as "In the Castle Garth," "Rare old Gossips," "Waiting for the Boats," and some of the Tyne River series. The beauty of these lies in the selection of strongly characteristic subjects, which he has rendered with broad treatment, and one is disposed to overlook in them certain defects of the figures and accessories. In "Waiting for the Boats," the figures tell somewhat unnaturally hard against the distant water, and in "On their own Hooks," "Rare old Gossips," and "A Motley Crowd," the composition is somewhat weak. In fact, where there has been much meddling with the figures, unnaturalness has generally resulted, and the moving of accessories has occasionally introduced artificiality and mistaken intention. All these pictures, as well as some of the Tyne and Wear series, are, however, strong and æsthetically pleasing in comparison with the niggling, narrow character, both in subject and treatment, of those previously referred to. If Mr. Sawyer's own observation has led him to these greater studies, all credit is due to him for his originality and insight, and he may be left safely to work out his own salvation. It is to be hoped he will

continue in that strain, somewhat alter his views in regard to pictorial portraiture, and avoid hybrid products, the result of painting and photography combined.

In addition to what have been mentioned, there are in the exhibition a large number of well-executed local views, some very large conventional portraits, very largely painted, and two or three curious but unnatural effects of artificial lighting, all of which may prove attractive to the public. X.

ACID SULPHITE OF SODA IN PHOTOGRAPHY.

Since the introduction of acid sulphite of sodium as an article of commerce, we have frequently been asked what is the relative value of it compared with the regular crystallised neutral sulphite hitherto used? As this is a very reasonable question, and one that is of especial importance in connection with the making up of developers from the formulæ given by the dry plate makers, we have taken the trouble to make some experiments in this direction, and thus give our readers some definite information on the subject.

Taking a good sample of the acid sulphite as it comes to us in commerce, one of the best that we could obtain, as supplied by our publishers, we found that 100 cubic centimetres of the acid sulphite solution requires 27 grains of dry sodium carbonate to neutralise the excess of sulphurous acid in it, and have it just alkaline to test paper. To put this into the ordinary weights and measures used by the photographer, 1 fluid ounce of the acid sulphite solution will require 123 grains of dry sodium carbonate to make it just alkaline.

As we have stated on a former occasion, the acid sulphite of soda is twice as strong in sulphurous acid as the neutral sulphite crystals. To put this a little more definitely, 1 fluid ounce of the acid sulphite is equal to 2 ounces by weight of the ordinary sulphite; but in using the acid sulphite, more alkali will be required to secure the same quality of developer. This additional alkali must be added in the proportion given above.

If we use crystallised sodium carbonate (soda crystals), the proportion must be increased two and two-thirds times, and the figures become 332 grains of soda crystals to neutralise 1 fluid ounce of acid sulphite solution.

Since the acid sulphite is twice as strong, practically, as the neutral sulphite generally used, it is only necessary to divide the figures given in any of the ordinary formulas by two, use this amount of sulphite, and add sodium carbonate slowly until the fluid is just alkaline, to obtain the same proportion as that given for the ordinary sulphite. The great advantage of this method of procedure is, that you can regulate the proportion of alkali in the developer much much carefully than when you use ordinary sulphite of sodium; this latter material containing variable quantities of sodium carbonate in excess, according to the care with which it is made. But, in our own practice, we find it much better to mix the acid sulphite with the eikonogen or pyrogallol at once, and use it as a preservative alone, not attempting to neutralise it until needed for developing. In this way we have preserved solutions of eikonogen and pyrogallol for months, and in a condition which we have never seen equalled by any other method of procedure. When about to develop, we add a little more of the alkali than is usually applied, and in the proportion given above.

In order to give some guide to those who prefer to use potassium carbonate as a developing agent instead of sodium carbonate, the proportions become as follows:—

One hundred cubic centimetres of the acid sulphite require 35 grains of dry potassium carbonate to make it just alkaline. In English measures, this becomes 1 fluid ounce of acid sulphite requires 160 grains of dry potassium carbonate to neutralise it. Of course, in using potassium carbonate with the acid sulphite of sodium, the resulting mixture contains both sodium and potassium sulphites, and since potassium sulphite is not as soluble in water as sodium sulphite, the potassium carbonate should not be added to the acid sulphite in the concentrated form, but only after diluting, as in the developer. If carbonate of potassium is added to the acid sulphite direct, after a while potassium sulphite will separate as a white powder that is difficult to get into solution again without heating the mixture. The best way to manage is to add the acid sulphite to the eikonogen or pyrogallol, as stated above, and use the extra potassium carbonate in the alkaline part of the developer.

The use of acid sulphite in the hypo bath is now a well-established practice, and we need not say anything here about it. With us stained negatives are a thing of the past, and we heartily recommend this new material to all who wish to obtain clean work in photography.—*Anthony's Photographic Bulletin.*

Literary Notices.

Ausfuhrliches Handbuch der Photographie. Dr. J. M. Eder. First part. (*Knapp, Halle.*)

The important hand-book of photography by Dr. Eder, which appeared in ten or a dozen parts, was commenced some eight years since, and was, undoubtedly, the most comprehensive and complete work in photographic literature. It is not so very long since the completion of this encyclopædic work, but we find that a second edition has already been commenced. We speak of it as a second edition, and the plan of the original publication will, no doubt, be observed; but, in the first part, which is now to hand, there is so much fresh matter, that the labour of collecting the material and arranging it must be nearly equal to writing an entirely fresh work.

The early history of photography has never before been dealt with in so complete a manner as in the opening part of Dr. Eder's work. "From Aristotle to the Alchemists" occupies nearly a dozen pages; then about ten more bring us to the period of "Gyphantia," a work which we have recently referred to. Passing on through the time occupied by Scheele, Priestley, and others, we come to Senebier, an experimentalist of whom more deserves to be generally known. A table is given which he had compiled, showing the comparative activity of various portions of the solar spectrum upon chloride of silver, the period of darkening ranging from fifteen seconds in the violet to twenty minutes at the red end. The work of many subsequent experimentalists, including Davy and Wedgwood, is quoted, but we close the "part" with regret at finding we must wait for the next one to come to that all important period of the work of Daguerre and Fox Talbot.

The present work is to be completed in about forty parts, and will probably include more than double the matter contained in the original edition. A work so encyclopædic in its character, and so conscientiously careful in its composition, should be in the library of all photographers whose acquaintance with the German language enables them to profit by it.

AN EXPERIMENT IN BOOK ILLUSTRATION.

Piazzi Smyth's "Teneriffe."

BY WM. LANG, JUN., F.C.S.

In 1858, now more than thirty years ago, a somewhat notable work was published, having for its title "Teneriffe, an Astronomer's Experiment; or Specialities of a Residence above the Clouds." The ordinary book collector, meeting with the volume on the shelves of some second-hand bookseller, would, in all probability, after taking a hurried glance at the illustrations, and seeing the somewhat yellow appearance of many of them, simply pass on, replacing the work on the shelf where he originally found it. Were our book-hunter, however, one interested in affairs astronomical, the faded appearance of the plates would not prejudice the book in his eyes; he would look rather to the matter contained therein, the record of a scientific enterprise nobly conceived, and no less nobly carried out. To the individual interested in photographic endeavour, the work appeals as strongly as to the student of astronomy. The author of "Teneriffe," C. Piazzi Smyth, Astronomer-Royal of Scotland, was, in his time, an ardent photographer. The conditions of working in the "fifties" were very different from what we now are accustomed to. No plate could then be obtained ready to receive its destined image, and capable of being put away for development at some convenient season—it may be weeks, months, or even years afterwards. The work done in the way of preparing the sensitive surface had, in the days of the wet plate, to be performed by the artist himself. Surely enthusiasm was the *sine qua non* required when collodion reigned supreme: that our author had this in no ordinary degree the present volume sufficiently bears out. His labours at the Great Pyramid in 1865, when he photographed its dark recesses by means of burning magnesium, were well known at the time not only to the photographic, but to the whole world. Events march so quickly with us now, it seems to me, that many grand achievements such as those accomplished in the past are quite unknown to the present generation. Knowing, therefore, the difficulties, we surely can all the more appreciate the results obtained—we may safely say single-handed—in the volume we are considering. Although it may now be truly said that the silver print for book illustration has been weighed in the balance and found wanting, still the early attempts to press it into this particular service must—or should, at all events—possess for us now a more than passing interest.

In the preface to "Teneriffe" we find our author paying this tribute to photography:—"By its necessary faithfulness a photograph of any sort must keep a salutary check on the pencil or long bow of the traveller." Piazzi Smyth was not content, however, to give to the reader a bald photograph of the scene portrayed; he wanted to go a step farther; he desired, if possible, to bring it before him in a manner still more realistic. This he attempted to do by means of the stereoscope, and herein consists the unique character of the illustrations accompanying the letter-press of "Teneriffe." We hear a good deal just now regarding the revival of stereoscopic work; it will, therefore, not be considered superfluous to quote still farther from the preface, bearing out, as it does, the importance attached by the author to this mode of representing the scenes he deems worthy of notice. Referring to the ordinary photograph he remarks: "It is not perfect; it may be tampered with, and may suffer from accidental faults of the material. These, which might sometimes produce a great alteration of meaning in important parts of a view, may, however, be eliminated when, as here, we have two distinct portraits of each object. Correctness is thus secured, and then if we wish to enjoy the effects either of solidity or of distance—effects which are the cynosure of all the great painters, we have only to combine the two photographs stereoscopically, and these bewitching qualities are produced."

It goes without saying that the stereoscope, to view pictures bound up in a volume, must be one which will be open at the bottom, and, from the advertisements connected with the publication when it appeared, such an instrument was supplied by Messrs. Negretti and Zambra; it folded up into small compass in a case, and was called the "Book Stereoscope." The term applied to the double picture was "Stereograph;" it sounds somewhat strangely to us now-a-days, but it nevertheless has the merit of being concise and appropriate.

Regarding the literary part of the work, it is not our intention to discuss this; but it may be simply stated that the contents are grouped under four headings: The Voyage and the Climb; On the Crater of Elevation; On the Crater of Eruption; and the Lowlands of Teneriffe. The number of photo-stereographs is twenty, and each one is fully described in the letterpress adjoining. Every effort had apparently been made to render the prints lasting. The printing was entrusted to Mr. Melhuish, of Blackheath, and the whole was under the superintendence of the worthy president of the British Photographic Society, Mr. James Glaisher, F.R.S. While we may take it for granted that every effort would be made to secure uniformity, it is very instructive, albeit somewhat sad, to note how scarcely two pictures are to be found presenting an identical appearance. The book was published by Lovell Reeve; from an outside source we learn that the edition was one of 2,000 copies, and the price it was issued at was one guinea. There is no occasion to enlarge further; the whole interest of the book to us lies in the fact that we have in it one of the first attempts to bring before the reader by means of photography those very scenes which the author himself has witnessed. Subsequent writers have followed in Piazzi Smyth's footsteps, and by improved processes of reproduction travellers have presented us with the very effigies of the people they may have visited, or given us facsimiles of the countries they may have passed through; but I am not aware that the stereoscopic picture has elsewhere been utilised in the manner indicated in the volume we have been considering. In naming his book "Teneriffe, an Astronomer's Experiment," he could, with an equal regard to the fitness of things, have likewise added "A Photographer's Experiment."

It would be instructive to have the idea once more carried out with our improved methods of reproduction—collotype, for instance. We recommend, therefore, to our publishing photographic friends a trial of the stereoscopic picture by way of illustration.

University College, Liverpool.—Mr. Charles A. Kohn, B.Sc., Ph.D., is about to give a course of evening lectures at this College on "Photographic Chemistry," commencing October 14th. The course will consist of ten lectures, illustrated by experiments and lantern slides, and will treat of the fundamental principles of chemistry in their relation to the various photographic processes.

Notes.

Some items relating to the Daguerre Memorial at Washington have not been pleasing to its promoters. In the first place, the monument itself has been almost unanimously condemned by the photographic press for its ugliness and want of taste. In the second place, the committee connected with the memorial has just had to report a deficit of five thousand dollars. The *American Amateur Photographer* holds that one reason for this may be that the project was started by one of the American photographic journals, and that rival journals therefore gave it but lukewarm support. It says: "There is a possibility, also, that not a few dollars failed to be forthcoming because their possessors, knowing something of photographic history, cared very little about helping to erect a memorial to the very clever scene-painter who had the wit to turn the discoveries of another to his own profit, and to claim as his that which, in part, rightfully belonged to another. But, whatever the cause, the fact remains sadly true that there is a deficit of five thousand dollars which must be met." It seems to be probable that all sections of photographers in the United States will now join to pay off the debt.

The Photographic Society of France has opened a subscription for the restoration of the tomb of Daguerre at Cormeilles, and the question has been raised why the same should not be done to restore the tomb of Nicéphore Niepce at Saint-Loup-de-Varennes, near Châlon-sur-Soane, for the tomb is in a complete state of dilapidation. Critical historical research has proved that Daguerre does not come out of his dealings with the Niepce family with clean hands, and that, all things considered, Nicéphore Niepce has probably a greater claim than Daguerre to be considered the founder of photography. To Daguerre, however, appertains the honour of accidentally discovering mercurial development.

Occasionally a tendency to originality is discernible in the devising of picture frames. At an exhibition in Milan we have seen some large, dark wooden frames, with broad patches of paint upon them, of subdued and unobtrusive colours, so selected and placed that, by contrast, they should heighten the effect of the adjoining portion of the picture. An exhibition was recently held in Washington, at which the designs upon some of the frames bore relation to the subject of the picture; for instance, one painting, "Fortune Telling," had on one corner of its frame some painted playing cards. On one corner of the frame of "The Startled Miser," money was represented. Another painting, "A Man's a Man for a' that," represented a sturdy blacksmith, and on the corner of the frame was a horse-shoe.

Next year the American Photographic Convention will be held in Buffalo. This year it was held in the National Museum at Washington, and, according to Mr. F. C. Beach, the exhibits were small, the space at disposal not well utilised, and it was more a Daguerre Memorial Convention than one likely to yield results of practical value to photography. One of the most curious facts revealed by photography, and brought under the notice of the public at the meetings, was stated by Mr. Thomas Wilson, Professor of Prehistoric Anthropology, in his address on "Types of Beauty." He said that, in determining the characteristics of the various types of mankind, it becomes necessary to have living specimens, and here it is that photography can aid anthropology. One of the great anthropologists of this century, in Paris, has been making a collection of the various types of mankind, and he does it by means of photographs. He has discovered, or thinks he has, that the type of origin—the race to which the party originally belonged—is better preserved among women than among men, at least, that the evidences and characteristics are better preserved among women than among men. So he has made his collection from among women, and, to make it more attractive and worthy, he declared it to be his intention to choose only the beautiful women for his types. Therefore, his is a collection of types or standards of beauty, and these are made by a series of photographs.

Among the amusements at those places of public resort at which merry-go-rounds, swings, and cocoanuts abound, a species of rifle gallery has lately come into vogue in which, in lieu of a target, sundry glass bottles are suspended from the roof for cockney sportsmen to aim at. There is possibly an additional charm in being able to smash something—if you hit it—which is extremely pleasing to the vulgar mind, and which accounts for the amount of patronage which these pseudo galleries receive. The bottles are of all shapes and sizes, from the humble pickle receptacle, to that which has held the vintage of champagne. Pausing before one of these establishments the other day, we saw mingled with these vessels of sacrifice several bearing the well-known pyro brand, and while we reflected upon this evidence of the ubiquitous photographer, we could not help quoting the well-known line, "To what base uses, &c., &c.," which was written some time since by the immortal William.

Ready sensitised silk is, perhaps, the most recent printing material which has been placed on the market, and we should think that it will be welcomed by many amateurs as something "new" upon which to try their skill. Printing on textile fabrics has engaged the attention of many, but hitherto such experimenters have had to prepare their own material before its exposure under the negative. In these days manufacturers are so anxious to meet a want half-way, that the worker is saved all trouble of preparation, and finds everything ready to his hand. There are many applications for this silk, and new ones will probably soon arise now that the material can be bought ready

prepared. Among those which occur to us are book-markers, banner screens, as well as d'oyleys for the dinner table.

The ready-sensitised silk will naturally commend itself to the attention of lady photographers who know how, by a few pretty knick-knacks, to make a boudoir look pleasant and home-like. The material is a thick, ribbed, white silk, and has that roughness of texture which, like rough drawing paper, and by a strange contradiction of terms, gives such exquisite softness to a picture. After exposure under a suitable negative, the silk is toned with gold and bicarbonate of soda, fixed, and washed in the ordinary manner. When nearly dry, a warm iron is passed over its surface, and, if desired, the picture can be tinted with water-colours. Besides the applications already named, the new material will doubtless be enlisted in the service of Christmas cards.

A case recently came under our notice which shows the value which is attached to a photograph compared with that of a drawing. Usually the case is reversed, and the drawing, if done by a skilled hand, ranks far higher than a photograph; but in this instance nothing but a photograph would do. The member of a provincial archæological association had taken the trouble to trace the history of an architectural relic of some interest about which very little was known, and when his work was completed he brought the matter before the society in question, and sent in with his manuscript a careful drawing of the object. He was informed, in answer to his communication, that the matter could not be accepted by the society unless the drawing were replaced by a photograph. This condition was ultimately complied with, but not without extreme difficulty, for the original was half way up the side of a steep hill.

The present fine weather is rather against the Photographic Exhibition. As a rule, Londoners by this time have finished their holidays; but there are hosts who have been tempted to stay a week or two longer at the sea-side, and, in consequence, all London exhibitions suffer more or less. Apart from this special cause, a less number of visitors may be expected in fine weather than when it is dull or rainy. People like sunlighted streets in preference to picture-galleries, and the experience of past years shows that cold and almost inclement days are more favourable to the Photographic Society's Exhibition than when the weather is warm and bright; but the Exhibition has almost a month to run, and there may be yet a chance for a few rainy and foggy days of the good old-fashioned style.

Reading between the lines of his speech at the first meeting of the International Literary and Artistic Congress at the Mansion House, it would almost seem as if Mr. John Leighton, F.S.A., regarded an Artistic Copyright Act as one which should protect not only artists and engravers, but the whole world, from what he calls "chemical operators"—in other words, photographers. Mr. Leighton referred to the fact that he was the only member present of the Art Copyright Committee who, about thirty years ago, codified the Acts relating to painting, engraving, and photography. Whatever these Acts may have done for painting and engraving, they certainly did little for photography. The copyright questions involved in photographs are hopelessly vague, and every attempt to legislate afresh has, up to the present, had a singular run of ill-luck. Thirty years ago the marvellous reproductive powers of photography were undreamt of. Photogravure had no existence, photographs in carbon were almost unknown, and the scores of photo-mechanical printing processes now in use were in their infancy. Could Mr. Leighton have foreseen these developments of the art, possibly the codification of the copyright would have embodied something which would have checked photographic progress. For it is from the engravers' point of view that he speaks, and engravers—the majority, at least—are no friends of photographic reproductions. Mr. Leighton, however, has been the victim of American "process" piracy, and much may be forgiven him on this score.

But did Mr. Leighton make himself quite clear when he said: "At present no one had a copyright in his own face, and great had been the violations perpetrated and the troubles inflicted alike on authors, artists, and publishers by the means of chemical operators who had the same protection as a Meissonier or a Millais." What can this mean? Is it a protest against the use of the instantaneous secret camera? If so, why should a photographer who uses a camera to take the portrait of a person unknown to the latter be more guilty than the artist who makes a positive sketch under the cover of a newspaper? But perhaps those points were elucidated on Wednesday, when the whole subject of photographic copyright came up for discussion, and we shall look for a full report of the proceedings with much interest.

How much of the artificial look which most miniatures of the old school have is due to the smooth locks and little curls primly plastered on the forehead it is difficult to say. Miniatures are often contrasted with photographs to show that the latter are very much better and much more artistic, but we are afraid the argument is pushed a good deal too far. Fashion has the power to make one blind to defects. The photographs of the crinoline, chignon, and pork-pie hat period are now detestable to one's eyes, and beside them the miniatures, wherein every lady is represented with a simpering smile, look beautiful. If rumour be true, the photographer will shortly have an opportunity of pitting his skill against the miniature painter of half a century ago, for it is said fashion has ordained that wavy and curly hair is to be discouraged, and that the hair is to be arranged in loops down the back, the miniature fringe on the forehead being flat as a postage stamp, and as well stuck down.

PHOTOGRAPHY AND BUSINESS.

BY ELLERSLIE WALLACE.

It is a very pleasing and encouraging thing to hear as old and experienced a member of the craft as Mr. Rockwood, of New York, say that he has been in active business for four and thirty years, and has never felt sorry at his choice of the art of photography as a calling.

In these days of plentiful, not to say superabundant, photographic literature, we find the two philosophical extremes of the optimists and the pessimists fully represented in our journals and annuals, and we regret to say that there are not wanting those whose views upon photography, particularly in its financial aspects, are directly the reverse of those expressed by Mr. Rockwood.

We are by no means disposed to take part in the discussion whether or no photography is a good means of earning a livelihood. We might as well waste time in inquiring whether it were worth while to raise cattle or vegetables as a means of making a living. We may dismiss this matter by simply saying that, having done our best to support our calling, we have found it to support us in return. If we were asked whether our business life had been free from trials, perplexities, and sometimes bitter discouragements, we should plainly answer, No! and then ask our questioner what calling he could recommend that was thus free from all vexations. We can occupy space and time to better advantage here by pausing, as it were, for a little, and looking about us at the present condition of the photographic world, particularly here in America

The first thing we notice, and greatly do we congratulate our fellow-members of the craft upon it, is the vast increase in the number of applied uses of photography. Aside from the well-worn ruts of portrait-making under the skylight, and ordinary landscape photography, we find new fields of industry in literally every direction we turn to. Interiors—easy, pleasant, and profitable work; portraits and interiors at night, either in public or private, also pleasant and profitable, if not quite so easy. Printing, either by the old or by any of the numerous new methods—profitable and easy. Lantern slide making, perhaps the most fascinating branch of practical photography, and one that is increasing in importance every day in the year. General business photography, including the photographing of real estate for advertisement, of samples of goods of every possible description for commercial houses, of enormous numbers of small portraits of celebrities for increasing the ready sale of various articles, such as cigarettes; photography in conjunction with the microscope, and the incessant calls upon the art made by scientific students and professors of all grades. We merely mention these few of the multitudinous uses of photography, so that if anyone should be a little discontented with the art as being narrowing and cramping in its tendencies, he may be set to thinking of the matter, and see that the fault lies in himself and not in photography; and farther, that if one kind of photographic business does not suit him, there are plenty of others for him to select from and pursue.

The question has frequently been raised whether the money-making side of photography was not seriously affected by amateurs and amateurism. Now we have always held to the opinion that the greater the number of amateurs, the greater the benefit to the profession. We know very well of the bitter complaints from certain quarters, that the local amateurs take away the business from professional men. But we are glad to see that these complaints grow fewer in number and less loud every year. Besides this, there is one point that these grumblers always lose sight of—namely, that immediately upon an amateur's receiving pay for his work, he ceases to be an amateur, and enrols himself amongst the professional members of the craft. We can, indeed, recall certain instances in which so-called amateurs had the effrontery to take pay for their work, and print their names and addresses, with the title "amateur," on their card mounts, like any regular member of the calling. This might be taken as conclusive proof of the gross ignorance both of the "amateur" and of the public he attempted to cater to, for everybody has always known, or been supposed to know, that an amateur in any science or art is one who follows it for amusement only, and receives no pay for his work. This, at least, is the conventional or commonly accepted sense of the word "amateur"; but we are afraid that the more elevated, as well as the more literal, meaning of the word is too often overlooked entirely. Properly rendered, "amateur" means one who loves (Latin, *amo*, I love), and one who thus really loves his art does not disgrace it and himself by such shabby tricks as we have referred to. If he does these mean things, and tries to call himself an amateur, he should be told that his receiving money has effectually banished him from the ranks of true amateurs, and that he is deserving of such treatment as the members of liberal callings visit upon the heads of those scab members who attempt to debase the same. The extent to which photography is indebted to the *real amateur* is a matter so well known that we need hardly mention it.

Out of the large number of amateurs now practising photography, there are many who are already, or who may in time become, of money value to the professional man. Men of business well enough off to make frequent trips to Europe and less known portions of the earth, generally find it all that they can do to make the exposures while *en route*, and will not require much persuasion to leave the routine laborious work of printing and mounting to the professional photographer. In most cases, if lantern slides or enlargements of any kind be required, the same plan will be pursued, and a very fair profit made. Scientific men of all sorts, physicians, astronomers, and others, are paying more and more attention to photography, but it generally amounts to their making the negatives only, and leaving the printing to the professional man, as well as the developing also sometimes. All of this, of course, benefits the photographer, and he would be a more than commonly stupid person who would not endeavour to extend and increase any opportunities of the kind that might offer. When we get into the "upper ten" among amateurs, we shall frequently find wealthy would-be æsthetes who prate learnedly about lighting, Rembrandt effects, and "Truth in Art," and consider the manual labour of printing from their negatives quite beneath them. We should not at all object to receive profitable work from such people, and in many cases might look forward to regularly instructing them, after a time, in the art of how to make a negative, for let us here remark that, as a general rule, the louder the art-talk of an amateur, the more detestable is his work photographically, and often artistically as well.

From our point of view, then, which in photographic matters is always that of the optimist, we regard amateurs as valuable to the profession in the strictly business sense.

Efficient assistance in the working of a photographic business is a necessity, and here the question will arise how and what to teach growing lads who have entered our employ with the *bonâ fide* intention of making photography the business of their lives. For our own part, we should prefer the assistance of any ordinary steady person, after a reasonable time of instruction under ourselves, than that of a stranger appearing with highly worded testimonials, and who was obstinately set in his own formulæ and ways of manipulating. A boy starting out to learn the business should be made familiar with the processes step by step, and gradually advanced to such difficult portions as developing and toning, and during this time of instruction we should keep his interest alive by allowing him to assist, now and then, during the posing and lighting; if he manifests any of the ideas which might in time make him a good person to handle sitters, train him for this also by sending him to art exhibitions, or, in default of these, set him on a regular course of art study from first-rate photographs and illustrated books. At the end of a year or eighteen months we should expect a very fair assistant from a young man whom we had thus taught, so far as the mechanical parts of the business are concerned, and one in whose hands a large portion of the business could safely be left in the event of our own absence. In regard to the salary paid, we may call to mind that while the heavier parts of the work are best done by men, the operations of trimming and mounting prints and binding lantern slides is quite as well, if not better, done by women and girls, who would probably consent to work for smaller compensation. Indeed, the neatness of handling required in printing renders it a peculiarly fit employment for women.

Amongst others things that are in favour of the photographer from the business standpoint, are the lower insurance rates charged, and the lower price of apparatus. If those who quarrel with the insurance rates had been in active business a few years ago, when ether and gun-cotton had to be kept on hand in comparative large quantities—and risks paid accordingly—the would see how vastly things have changed for the better since the introduction of gelatine plates. The lower prices of apparatus, even in spite of the high wages demanded by skilled labour, show that there has been improvement in making the apparatus of a solid, practical character without unnecessary outlay of the skilled labour in excessive finishing. so that the camera (or whatever else it might be) was made to resemble a piece of ornamental bric-a-brac.

In concluding, we can truthfully express our feelings as being, on the whole, well satisfied with matters in general, and can thankfully say, in the words of a well-known volume, "Godliness with contentment is great gain."—*American Journal of Photography.*

Light.—If we study the action of light as exhibited in photography, we shall enjoy hours of amusement and instruction watching the action of such light on a variety of chemical substances. This investigation would well repay any earnest student.—F. W. Sutcliffe, in *The Journal of Microscopy.*

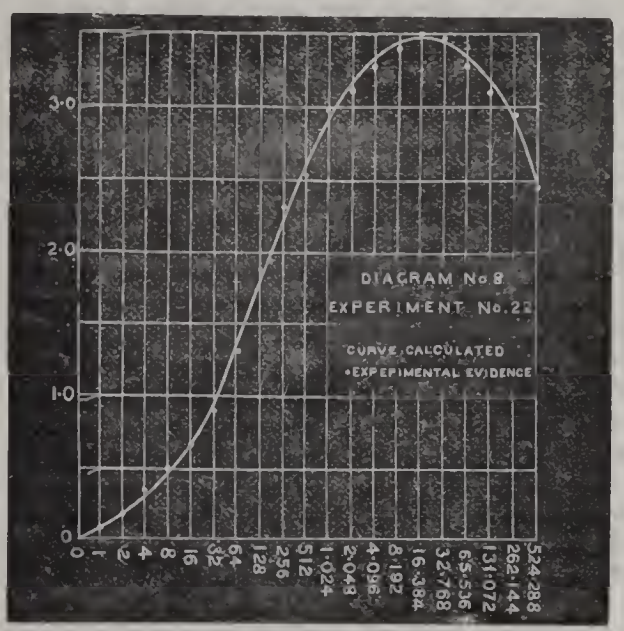
A photometric balance has been invented by M. Lion, who uses for this purpose the dangerous explosive substance iodide of nitrogen. If this is obtained, he says, by allowing ammonia at 22° to act upon iodine, it may be managed without danger if kept in the liquid. It yields a supply of nitrogen which is proportional to the intensity of the light which falls upon it. The evolution of the gas begins and ceases instantly with the luminous impression.—*Monthly Magazine.*

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

V.—Action of Light on Sensitive Film.

IE in any part of the curve of densities, as represented in diagram No. 7, the densities were proportional to the logarithm of the exposures, we should discover that portion of the curve if, instead of choosing the exposures as abscissæ, we used the logarithms of the exposures as abscissæ. This is easily done when the exposures progress, as they always do in our experiments, in a geometric series. We have only to mark every new exposure equidistant from the previous one as abscissæ. In this manner the results of experiment 22 are plotted in diagram No. 8.



It will be perceived that the curve now consists of four distinct branches. It proceeds from exposure 1 in almost horizontal direction, ascends slowly to exposure 16; from thence it proceeds almost in a straight line to exposure 2,048, when the growth of densities becomes slow. The densities reach their maximum at exposure 16,384, and from thence the curve returns, the densities diminishing slowly with increased exposures.

We accordingly distinguish four different periods of exposures. The first period we term the period of "under-exposure;" it is comprised in the first curved portion. The second period, that during which the curve is almost a straight line, we call the "period of correct representation." The third period is that during which the curve is again strongly bent as far as its maximum; this is the period of "over-exposure," and the last portion of the curve we term the period of "reversal."

1. *Period of Under-exposure.*—During this period the ratios between two densities are at first accurately equal to the ratio of the corresponding exposures. It is very difficult to study this portion of the curve accurately, owing to the short exposures which it demands, but still more owing to the small densities which this period yields, and which are difficult to measure. By making very slow emulsions we have, however, succeeded in showing clearly that at first the amount of silver reduced is proportional simply to the exposure. Thus, a plate

* Continued from page 773.

made by ourselves, with pure bromide of silver, gave the following results:—

Exposure, 20 C.M.S. Density, ·125 or 1
,, 160 ,, ,, 1·055 or 8·4.

The ratio between the densities being very nearly 8 the ratio of exposures.

Again, a "United Kingdom" plate gave the following results:—

Exposure, 2·5 C.M.S. 0·160. Ratio, 1.
5·0 C.M.S. 0·313. 1·95.

A very slow "Manchester" plate gave the following results:—

1 C.M.S. 0·260. Ratio, 1.
2 C.M.S. 0·550. 2·1.

But of course there is no definite point which marks the end of this period and the beginning of the next. But it is from this period that we learn that, for short exposures, the *amount of silver reduced is directly proportional to the exposure.*

2. *Period of Correct Representation.*—The second period of exposures we have thus named because during this period a plate is capable of giving a negative differing as little as possible from that which, at the beginning, we defined as theoretically perfect. That definition demanded that the densities of the negative should be proportional to the logarithms of the exposures which produced them. It is characteristic of this period that the *densities are proportional to the logarithms of the exposures.* This is shown on diagram No. 8, where the densities are the ordinates, the logarithms of exposures are abscissæ, and the period of correct representation a straight line. We have measured densities of dozens of plates falling within this period, and we find them all to conform to this very simple linear equation—

$$D = \gamma [\log. I.t + C],$$

D being the density, γ a constant depending on time of development, I.t the product of intensity of light and time —*i.e.*, the "exposure"—and C a constant depending upon the speed of the plate. As we shall give further detailed proof of this, we will here merely insert one example of a plate, the constant C of which is zero; it is Plate 2 of experiment No. 13. That plate gives the following results with equation:—

$$D = ·175 \times \log. \text{exposure}.$$

Exposure.	Density found by Experiment.	Density Calculated.
10	1·74	1·75
20	2·37	2·27
40	2·91	2·75
80	3·33	3·30

Many similar examples will be quoted presently.

We have thus arrived at the answer to the question, Can negatives be produced such as we defined to be theoretically perfect? And this answer is, they *can* be produced, but only by so carefully adjusting the time to the intensity of the light, that the exposures may fall within that period of correct representation. No variations whatever in development will correct an under- or over-exposure.

3. *Period of Over-exposure.*—Little need be said about this period. As the curve tends to become parallel to the axis of abscissæ it is clear that when exposures fall within this period, shadows and high lights will all be represented by densities which are almost equal. There will be no contrasts. In the first period of under-exposure the contrasts are too great; here they are too small.

4. *Period of Reversal.*—This period we have named the period of reversal because within this period happens that peculiar phenomenon, the transformation of the negative, into the positive the "solarisation," reversal, &c. It is easy to understand how the negative becomes a positive. Whilst the deep shadows still act upon the plate, increasing the density, the high lights have passed their maximum, and their densities grow less and less. The more the exposure is prolonged, the less dense the high lights become, the shadows exceeding them in density. It is quite easy to observe this phenomenon of reversal with a powerful petroleum lamp or gas burner, or to produce by direct contact printing a secondary negative, instead of a positive, from the original negative, by about fifteen to twenty minutes exposure at six inches distance from the light. When, in the camera, exposure is prolonged, it is well-known that a positive is obtained instead of a negative. It has been stated by Jaunsen that a secondary negative and a secondary positive can be obtained by prolonging the exposure still further. We have not, however, been able to verify this statement, and we believe it to be erroneous. Our investigations show that the density tends to a limit, and a picture produced by prolonged exposure in the camera is gradually lost in a uniform veil of fog, though it is still visible even after a three days' exposure.

A "United Kingdom" plate received various prolonged exposures, with the following results:—

		Difference.
75,000 C.MS. gave density ...	1·415	
		·304
150,000 ,, ,, ...	1·111	
		·141
300,000 ,, ,, ...	·970	
		·045
600,000 ,, ,, ...	·925	

A piece of the same plate exposed to direct daylight for ninety minutes (about six million C.M.S.) gave a density 1·200. From this it appears to us that there is an equilibrium established between the action of the refrangible and less refrangible rays.

The period of reversal is, theoretically, exceedingly interesting, and deserves further careful study, but the reversing action is so slow, and requires such enormous exposures, that it does not need to be considered from a practical point of view, and we shall disregard it entirely for the present. The three first periods—that of under-exposure, that of correct representations, and that of over-exposure—are the only practically interesting portions of the curve. We have already stated that, during the first period, the ratio of densities is equal to the ratio of exposures, *i.e.*, the amount of bromide of silver reduced is proportional to the exposure, whilst, during the second period, the density only grows in proportion to the logarithm of the exposure. It almost ceases to grow during the third. Of course, these assertions are only two approximate statements of one single law connecting the densities with the exposures.

(To be continued.)

Edinburgh Photographic Exhibition.—The space at disposal is, it is stated, well taken up, and the Exhibition promises to be a very successful one, many of the principal photographers in the Kingdom having intimated their intention of exhibiting. The Lord Provost of Edinburgh has consented to perform the opening ceremony on the 14th prox.

AN AMATEUR AT THE LAST WASHINGTON CONVENTION.

BY CATHARINE WEED BARNES.

It was suggested to me late last spring that it would be well to enter the professional competition at Washington, in August, for the "Enoch Arden" prize. Finding that amateurs who paid their dues to the National Photographic Association of America could compete with their professional brethren, I entered the Association, and received the circular of regulations. As expressed in my July editorial, the subject of illustrating poems has a wonderful fascination for me. I began the preliminary study of the poem with an earnest zeal which led me to write the above-named article. It seems to me, now the victory has been decided, that it may be of interest to other amateurs to learn how one of their number prepared for such a contest. It was more through a hope of gaining valuable help in an advanced department of the school of experience, than from any idea of eventual success in winning the prize, that the work was undertaken. These were gained, as they could not fail to be, but the prize, as is known, went elsewhere.

Many hours of thoughtful study were spent in selecting the lines which, it seemed, might best express the poet's ideas to one who, perhaps, might not have read the poem, or scarcely remembered it. Passing over the child-life of Annie, Enoch, and Philip, which I did not think could be used when only three pictures were allowed, I decided on the early married life of Annie and Enoch for the first picture. It did not seem correct to take fragmentary scenes without proper connection, and then, to be consistent, I was obliged to include only such lines as required little, if any, out-door scenery. Much searching of books of travel, magazines, and art works aided me in designing the scenery and costumes, and then the sitters had to be carefully chosen. Believing that in what artists call a "picture" painted or simulated effects should, if possible, be avoided, I got a carpenter to make me a wooden framework covered with painted boards, such as would naturally form the walls of an English sailor's cottage. Everything was to be extremely plain, from the rag carpet to the old-fashioned table and dishes, while the bird-cage hung in the passage-way, and Enoch mended his nets over the half-open door, watched by Annie inside the room as she mended her husband's socks.

A sailor's costume was easily planned, but Annie's must be of some soft, clinging material, inexpensive, and made in the style of a century ago. Ordinary sateen and home sewing accomplished this, and all of the other accessories were meant to express the surroundings of a happy, simple married life.

The day set for the sittings proved stormy, but by 6 a.m. I was out in the studio putting the last touches to the scenery, and thinking of different poses. After breakfast posing began, and before noon eighteen exposures had been made without any help to fill plates, adjust the heavy camera-stand, and generally make life easier. After development with pyro and soda, which in this, as in the subsequent work, was slowly and carefully done, the negatives were all laid aside for future selection. None of them were in any way retouched, and the average exposure was ten seconds.

The second picture was the hardest of all to conceive and execute. The scene selected was where Enoch, returned, sees, through the window of Philip's home, his beloved Annie watching her babe on its father's knee, while his own children stand looking on, a happy family circle. The light from the room into which he gazes shines on Enoch's weary, sad face, and that which would have fallen on the ivy-covered wall and crouching figure was curtained off, confining all but a few rays of light to the interior of the room shown through the half-open window, it being night when Enoch sought Philip's home. After careful consultation with Mr. L. W. Seavey, he made me the wall and window, but the ivy and branches that nearly covered it were natural growths, and the turf and gravel in the foreground came from the garden about my studio, the former being laid on zinc to protect the floor from dampness. Great care was needed to properly place the little furniture the room could hold, and in arranging the group of several grown people and a five-months' old baby. It was not easy to procure proper subjects, devise costumes, or manage to focus on sitters placed in anything but a straight line, and have everyone and everything in proportion. It was another struggle to have the inside group just enough visible to appear natural, but Enoch, as the important fact of the picture, required the greatest care in treatment. Of the two dozen exposures made that hot day, all but one were rejected for some slight defect. It was necessary several times, in making this and the other pictures, to pose myself in the required attitude before the sitter caught the idea I wished to convey. The studio is nearly twenty-three feet long, but so much was taken up by the scenery that I had to build out a platform from the front door, and a framework covered with non-actinic cloth, so as to run my camera-stand several feet outside the building. In this and the last picture I had someone to change plates and help with the heavy work, but not with the arranging or posing.

The last picture was the first taken, and the wall of Enoch's room was made of rough boards stained and defaced by age and hard usage, while the doorway partly revealed an old staircase. Everything was intended to sharply contrast with the comfort and abundance of Philip's home. Overhead, shutting out the top-light of the studio, was a timbered ceiling made under my directions by a carpenter so as to make the room appear as it naturally would—dim and shabby, with all the light coming from the side. This scene also required several exposures.

Then came the work of final selection of the negatives for the three best ones. I took the latter to the gallery of a professional friend, my own not having conveniences for such large work, the negatives being 11 by 14. There I spent a day in printing and toning the selected pictures. He then mounted, framed, and sent them to Washington.

It is needless to say that the benefit of comparing one's efforts with the work of those who are supposed to be thoroughly proficient is worth much to those who sincerely desire to improve their work, and I, personally, feel confirmed and strengthened, if that were needed, in my love and interest in camera work by my Washington experiences. They also taught me, and I wish to impress this strongly on all camerists, that while, with expensive accessories and a large studio, one can most easily do fine work, it is possible in a smaller room, with considerable exercise, it may be, of brain and body, to bring about results of which one need not necessarily feel ashamed. Of course a good lens and plates are absolutely necessary. Mine was a

Voigtlander W. A. euryscope, and I used for two of my negatives Newcomb and Owen's plates, and for the other Allen and Rowell's. Both were sent me especially for this purpose, and were equally good. A quick, inventive brain can supply more of the other requisites than would be believed possible by those who think that such things can always be purchased; but it means hard labour every time, and a willingness to put one's own hands to every detail of the work. With every obstacle or troublesome difficulty, I was continually told it was *impossible* to do thus or so, to which my reply was, "I don't like that word: very few things are really impossible." "Well, I don't see how you are going to manage," would be the comment on this, to which I would say, "Neither do I at this moment, but I mean to *find* a way." The portrait studio is an excellent place for patience to have her perfect work, and the Christian graces find plenty of unconscious teachers through which to impress themselves on many a pupil. But it is a curious fact that the more one does the more one can do, as long as strength lasts, and if women could always systematise their work as men can, the results would startle them. The manifold cares of a household with its incidental "werryments" make regular work of any kind difficult, if not impossible, for many of them, but determination works wonders, and I wish to urge on all, women and men, who find in camera work a vital source of interest and benefit, do not play with the work, but make it a real, genuine part of yourself, and you will be doubly, trebly rewarded. In its far-reaching, ever-extending field of exploration you will gain a broader, wider, deeper culture than you dreamed might be possible, and, deeply as I revere and honour the work of brush and palette, I shall never regret my transferred allegiance to the camera.—*The American Amateur Photographer.*

APPARATUS AT THE PHOTOGRAPHIC EXHIBITION.

I.

AMONG the specimens of apparatus on view at the Photographic Exhibition is Mr. T. Samuels' arrangement in which a leather case is fixed to the camera legs, as shown in fig. 1, so that the case cannot be lost. The same cut shows that the camera case can also be used on the top of the stand, so that the camera can be covered promptly while it is on the top of the stand, and thus be protected at once from any sudden shower of rain, yet be in readiness for the taking of the next view required. The legs and camera can be carried over the shoulder while the camera is in its case. In stormy weather the case thus in position increases the area presented to the wind while the exposure is being made, which seems to be a drawback.

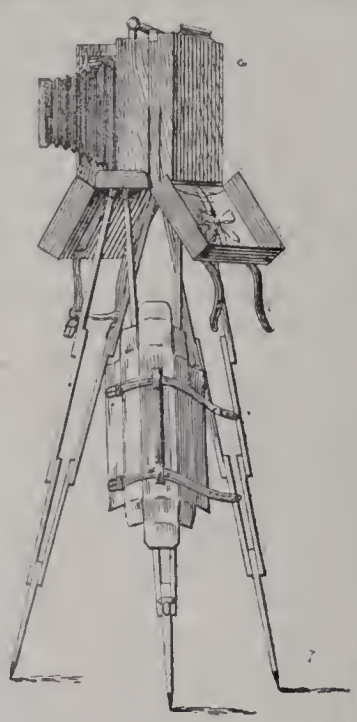


Fig. 1.

Fig. 2 represents the camera itself, as devised by Mr. Samuels. It is one of that class which, when closed,

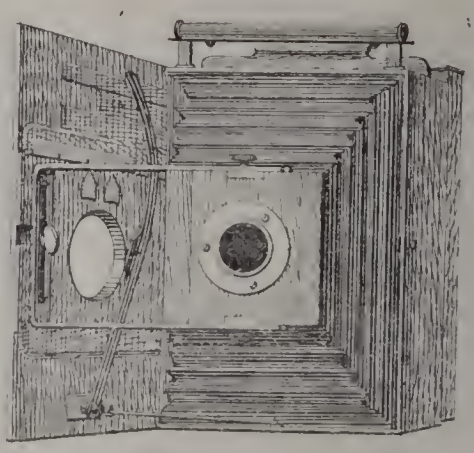


Fig. 2.

forms a rectangular box, exposing little which might be liable to breakage by an accidental blow. The focussing is done quickly by a lever arrangement; the long lever, of bent form, is represented in the cut. By means of two thumb-screws and a brass support, represented in the engraving, the front of the camera can be fixed in any position, and the focussing can be done by measurement by means of scales and pointers. A flexible transparent screen can also be used for focussing; it winds upon and unwinds from a roller, represented on the top of the camera. This screen, when extended, did not lie very flat, perhaps because visitors to the Exhibition had been pulling it about. When closed, the camera presents no screws or projecting parts. The dark slides of this arrangement are furnished with a special device for locking the shutters. Mr. Samuels has also introduced some minor improvements into this camera.

Fig. 3 represents a studio stand exhibited by Messrs. Marion & Co., in which the camera slides up and down a substantial iron tube, and can be clamped thereupon at any level. A counterbalancing weight is in the inside of the tube, and is connected with the baseboard of the camera by means of a rope passing over a pulley wheel. The two hind feet of the stand are longer than the two fore feet, and the former are connected with the top of the stand by means of two iron tie-rods.

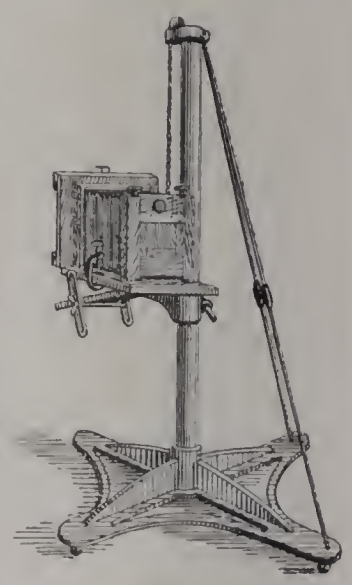


Fig. 3.

Fig. 4 represents one of that class of shutters in which a time arrangement is attached to the roller-blind shutter of Kershaw. Shutters of this class are among the best and most useful in the market for use in front of the lens; they are rapid, light, and give no vibration. In Messrs. Marion's shutter, represented in the engraving, the shutter is set by means of a small brass lever; it is released by a piston connected with the usual pneumatic flexible tube-and-ball arrangement. Other of

the exhibits of Messrs. Marion & Co. we shall describe hereafter.

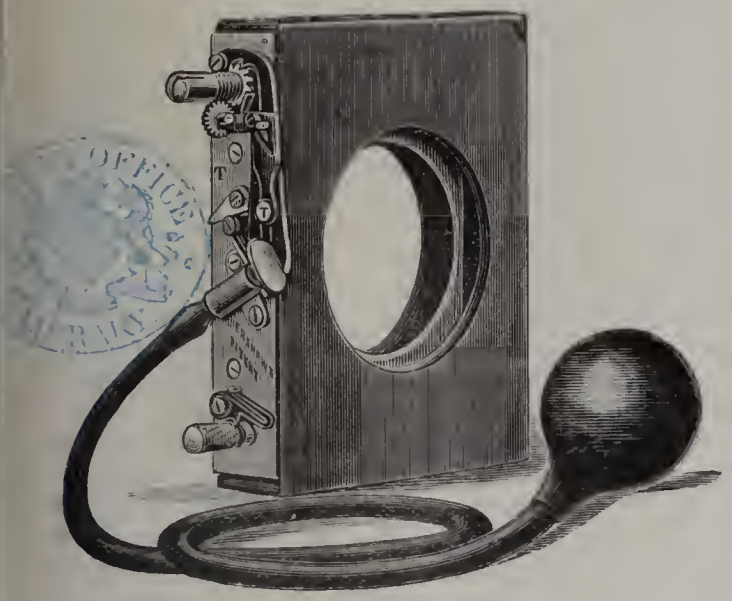


Fig. 4.

Sir David Salomons exhibits a rocking-table for use in the development of plates. It is represented in fig. 5, in which K N is a glass rocking-platform connected with the iron rocker shown "on the swing" near the bottom of the cut. A H is a sheet of looking-glass to reflect the ruby or yellow light from a developing-room lamp upwards through the glass table and the glass bottom of the dish holding the negative. In front of the apparatus two wooden handles and two long spiral springs are represented; these are for raising or lowering the two front legs of the table, so that the developer can be made to act more upon one part of the negative—say the foreground—than upon the other part. A merit of this arrangement consists in the neat way in which the iron weight of the rocker is got out of the way of the operator; it is a horizontal cylinder vibrating under the table, and connected with the glass platform K N by two iron rods.

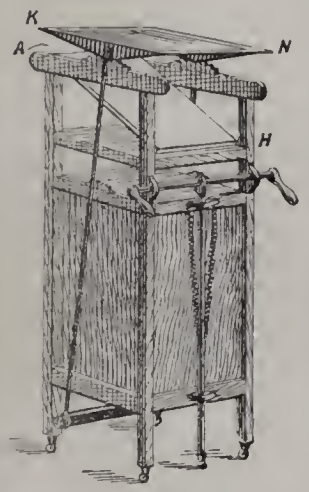


Fig. 5.

Mr. Morley exhibits a simple shutter, which both at the Exhibition at Pall Mall, and the Photographic Exhibition at Geneva, where it is now also on view, attracts some attention from the visitors. It is always set: it gives time and instantaneous exposures, regulated by the projecting head represented to the left of the cut; by means of an india-rubber ring it will fit on to hoods of different diameters, within a narrow range. Extremely rapid exposures can be made by pinching the india-rubber tube and squeezing the ball at the same time, then suddenly releasing the pressure on the tube.

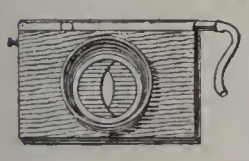


Fig. 6.

The Photographic Club.—Subject for discussion on Wednesday, October 15th, "Registration as Applied to Photographic Printing"; October 22nd, "Photographic Copyright."

OPERATING NOTES.*

BY L. J. ULLMAN.

I will begin with the curtaining of the light. Nearly twenty years ago, I advocated a system in which the curtains of the skylight were divided into six sections. The curtains were run on wires *parallel* with the side light. I believe this method gives better control of the light than by the usual way of curtains on rollers running from the lower to the upper side of the light; at least, such is my experience. The side light for bust work should not be open except above five feet from the floor. In groups and full figures the light may be used much lower. We should always keep in mind that the general direction of the light falling on the subject should be about an angle of forty-five degrees. This is, of course, varied for certain picturesque effects which the taste of the operator may devise.

I prefer ordinary white sheeting for the material for curtains; on a north exposure one set is sufficient, but where much sunlight has to be shut out two sets are found desirable. It is my custom to place the subject for ordinary portrait lighting a very little back of the centre of the light, and for Rembrandt and shadow-effects slightly forward of the centre. The usual position for the Rembrandt light is to work diagonally toward the side light, but if brought forward as suggested it will be found that the finest results may be obtained working parallel with the light. An important factor in the production of fine portraits, and one often overlooked, is the distance between the subject and background. If you wish atmosphere and apparent space or perspective to relieve the image, you *must have* it; the lens cannot produce it. Let plenty of light fall between the subject and ground, and there will be a feeling of fine relief that is not otherwise obtained.

I am a great believer in the value of the head screen. Used in connection with a screen frame about 6 feet high by 3 feet broad, in which are hung two smaller frames supported horizontally at each end by pivots which allow them to be inclined to any angle, and then covered with *thin* muslin, you will have in this combination the means of obtaining any desired lighting *without* the use of curtains to the light. The reflecting screen should be in two sections, adjustable like the screen above described. One side should be covered with white muslin, the other side coloured a light drab tint. A reflector is a necessary article, but its injudicious use damages a great many negatives otherwise good. The chief reason for sectional curtains, as described, is that light may be admitted from any direction and in any quantity desired, making the use of a reflector seldom necessary. Now, if anyone will try covering the entire light with white curtains, and will then take a negative; afterward put back every curtain and flood the room with light, and then take another negative, giving the same time as before; develop them together; the result will be a lesson in lighting which will be of great value. The result will be that one negative will be soft and full of subdued detail, the other hard and lacking in full shadows. The other, taken with the east light, has the best time. You all know that a sunlit landscape requires more exposure to produce a soft negative than when the sun is veiled with light clouds. It is the same in studio exposures. Hence use only a small opening of direct light, only enough slightly to accent the high-lights.

* Read at the American Convention.

The result is perfect in modelling, and every way more satisfactory. Another way is to use the light uncurtained, then control the light with the screens before mentioned. In all bust-work for large sizes I use the latter method. The idea I wish to convey is: *Use a soft, well-diffused light.* It is more agreeable to the sitter, secures good modelling with short exposures, and saves greatly in the retouching.

I notice of late a great stride in the right direction, and that is in the adoption of more simple designs for backgrounds. In many instances it has been a little difficult to tell which was the subject and which the accessory. In every detail of the business of the best galleries there is a decided improvement in an artistic sense. The new order of things proves one thing pleasant to contemplate, and that is, the beneficial influence exerted by the Photographers' Association of America.

I cannot forbear in this connection to mention another element which is contributing to the dissemination of knowledge among us, and that is "The Photographers' Free School." Now, I don't think any of you have ever heard of it before, but many of us have partaken of its advantages. The professors are paid by such liberal men as Cramer, Seed, and Carbutt, and by the Eagle and Phœnix Companies.

I allude to the demonstrators. These men are selected as the best qualified to be had, to show the respective merits of their plates, and are usually capable and willing to impart their knowledge to any who ask.

A photographer who was called upon one day by a demonstrator, said to him, "I will not buy of you; yesterday you spent some time instructing Mr. ——; he is my competitor, and you have no business to do so." The demonstrator replied, "Does not the golden rule apply to photographers? *You* are a man who has grown grey in the business; he is almost a boy, and is working earnestly, if not for fame, at least to support a mother and young sister. If you feel like that, I don't think the house I represent would care whether you use their plates or not."

Now, as a rule, I think photographers are nice men, but you all know the old saying about the black sheep.

Photographs almost always lack the quality of breadth. There is too much *prominent* detail to satisfy the artistic taste. Greater breadth is imparted by softening the light and using large diaphragms in the lens. A picture requires breadth because it then appeals to the *imagination* of the beholder. The richer the picture is in its *suggestions*, the greater its merits as an artistic production.

I may illustrate by describing a painting representing a storm on the sea-coast: As I gazed on the sky with its dark, flying clouds, and on the waves dashed into showers of spray against the rocky shore, it seemed that I could *hear* the whistling of the wind and the thunder of the surf. The sea-line was scarcely visible, and in the breakers was the piece of a spar bearing a few broken strands of the rigging; all suggesting that the angry waters might conceal the story of a wreck with its attendant horrors. Now, on examining the painting closely, it looked as if it might have been done with the refuse of a house-painter's dried up pots, and *any* kind of brushes from shoes to brooms. As for detail there was none; and yet, when viewed from the proper distance, the power of the scene thrilled one indescribably.

Now, although we are hedged about and limited by the powers of our lenses, yet we have the greatest things necessary—light and dry plates—and by their intelligent use we shall yet do far greater things than has yet been accomplished, and I believe the next exhibit of this Association will prove it. We have, all our lives, been trying to see who should make the *sharpest* picture, and the lens makers have helped us. This is all right, for *we* have demanded it. It is in this way we have discarded our best friend—*breadth*. Petty detail and breadth are mortal enemies, and the sooner we acknowledge the fact, the quicker shall we see the artistic excellence of our work improve. Well, says someone, how can I get it? I say *cut loose* from *small diaphragms*, and even then take a turn out of focus; study the effect. Give soft, rich lighting, simplicity in posing, and make your draperies fall in broad folds. Keep out of your pictures all *big* patches of white. Remember that flesh is never white under any circumstances, and neither is white to be represented white if in shadow. A very small space of white is a sufficient key for a large picture.

In the works of Adam Salomon we have the nearest realisation of what I have attempted to describe. With the increase of knowledge and new appliances, may we not hope for great things?

Patent Intelligence.

Applications for Letters Patent.

15,091. A. McDonald, 1, Lawn Terrace, Silloth, Cumberland, "Chemicals for Developing Photographs." — September 24th.

15,092. F. C. Suggate, 9, Elysium Terrace, Northampton, "Photometer."—September 24th.

15,100. J. F. Fetter, 13, Victoria Street, Westminster, "Instantaneous Photographic Apparatus." — September 24th.

15,112. T. P. Watson, 53, Chancery Lane, London, "Stand for Studio Cameras and Optical Lanterns."—September 24th.

15,127. J. P. Bayly, 18, Fulham Place, Paddington, London, "Camera." (Edgar Bullard, United States).—September 24th.

15,142. M. J. Norwood, 1, Sussex Place, Lambeth, London, "Making Stained Paper equal in appearance to Stained Glass, and rendering the same clear by the use of Turpentine, Varnish, and Copal, Terebine, Pine Oil, Boiled Oil, Linseed Oil, Bicarbonate of Soda, Size, and Dextrine."—September 24th.

15,185. G. Stephens, 46, Chancery Lane, London, "Photolithography."—September 25th.

15,292. W. Stroud and J. R. Rendell, Whinside, Whalley Road, Accrington, "Optical Lanterns."—September 27th.

15,460. J. Gage, 6, Lord Street, Liverpool, "Toy Camera." —September 30th.

15,495. W. J. Lancaster, 6, Liverpool Street, Birmingham, "Detective Cameras."—October 1st.

15,577. A. Jones, 3, Upper Gilmore Place, Edinburgh, "Portable Cameras."—October 2nd.

15,615. J. J. Wilks, Uplands, Beckenham, Kent, "Cleaners for Windows or Pictures."—October 2nd.

15,668. F. Rust and A. E. Staley, 50, Lordship Road, Stoke Newington, London, "Combination Plate-holder and Dark Slide."—October 3rd.

15,740. F. W. Crowther, 9, Warwick Court, High Holborn, London, "Packing Photographic Films on Glass or other Supports."—October 4th.

Specifications Published.

15,163. *September 26th*, 1889.—"Photographic Cameras." Abraham Dirk Loman, 361, N. Z. Voorburgwal, Amsterdam, Manufacturer.

The object of my invention is so to construct and fit with such appliances photographic cameras, and especially hand or portable cameras, that the object can very easily be exactly

focussed that the longest or the shortest desired exposure can be given to the sensitive plate therein, and that no vibration will be given to the camera by such exposure, or, that is to say, by such movements of those parts in this camera that allow the exposure, and I realise all these advantages in a very simple and effective manner.

To carry out this object, the camera forms or is placed in a preferably rectangular casing of the desired size, one end whereof, or part of the same, may be open or capable of being opened, and the lens is placed at or near this opening, preferably being mounted, as is usual, in a tube, and when the lens is behind the opening this tube can be secured in and to a partition placed transversely in the casing, and a rack and pinion movement is provided which can be operated from outside the casing, and by which this partition may be moved, or the tube may be elongated or shortened to bring the object into focus, and suitable stops, preferably diaphragmatic, may be fitted to the lens or to the lens tube. When the partition is to be so moved, suitable opaque bellows can very conveniently be fitted between and to the opening of the casing and the partition round the lens tube to make this partition light-tight. The proper distance behind the lens is horizontally and transversely pivoted in the casing, and near the upper part of the same by its upper and further edge, a mirror corresponding wherewith a piece of ground glass is inserted into the top of the casing, and this mirror, when inclined downwards at the proper angle, receives the image through and from the lens and transmits it to the ground glass. The mirror and the ground glass are suitably surrounded by opaque bellows, and when the same are extended an opening made in the front part thereof corresponds with the lens. Below the mirror is fitted in the casing an india-rubber pocket or other pneumatic bellows, which can be operated from outside the casing by a collapsible ball, and is connected by a link or otherwise with the mirror in such wise that when and as the same is distended, the mirror is folded up against and parallel or thereabouts with the ground glass. Behind the mirror is inserted in the casing the dark slide that holds the sensitive plate or plates. All these parts are so arranged that when the image has been focussed on the ground glass it will also be exactly in focus on the sensitive plate, or a certain predetermined movement must be given as aforesaid to the lens whereby it is known this exact focussing will be effected. Any suitable shutter may be used in and with this camera that will give a timed or an instantaneous exposure, as may be desired, and I preferably use what is known as a blind shutter, placed behind the mirror and immediately before the sensitive plate, and more especially the blind shutter that is described in the provisional specification accompanying another application for a patent which I have made this day.

The method of using this camera is as follows. When the image has been duly focussed on the ground glass, and the known correction (if any) has been duly applied to such focussing, and the sensitive plate has been placed in position and uncovered, if a timed exposure is required the shutter is properly arranged therefor, and then, by the pneumatic bellows, the mirror is raised and the required exposure is given to the sensitive plate, when the pressure is removed and the mirror is allowed to regain its normal position, being assisted therein, if desired, by a spring; but if an instantaneous exposure is required the shutter also is properly arranged therefor, and then in the same manner the mirror is raised until it comes in contact with a spring, or catch, or other appliance which, when pressed, will allow or cause the shutter to act and give the required exposure.

Instead of inserting the ground glass, as aforesaid, into the top of the casing, I may, when I so desire, insert the same into one of the sides of the casing, moving the other parts of this camera, where necessary, into the proper corresponding relative positions.

18,062. *November 12th*, 1889.—"Purifying Compounds of Alumiuium." Hamilton Young Castner, 115, Cannon Street, London, Managing Director of The Alumiuium Company, Limited.

Traces of iron in aluminium give it a yellow colour, and with the difficult task of removing the iron this patent deals.

The object of this invention is to purify the anhydrous double chloride compounds of aluminium, such as the double chloride of aluminium and sodium and others.

In the production of metallic aluminium from the double chloride by the action of sodium or otherwise, it is of great importance that this compound should be pure. It is, however, ordinarily contaminated with iron, which renders the aluminium also impure.

My present invention relates to a method of purifying these double chlorides by decomposing the chlorides of iron which they contain by the use of the electric current, the apparatus and the quantity of current used being so arranged as to decompose the ferrous and ferric chlorides, and to deposit the iron in the form of metallic iron, leaving the double chloride pure.

To do this by my invention, it is necessary to melt the impure anhydrous double chloride of aluminium, and pass through it an electric current of proper magnitude, taking care that the molten crude chloride is kept in motion between the electrodes, and further, that the current which operates on the double chloride is diminished from time to time, so that it may just be sufficient to cause the iron to be deposited, but not to deposit any substantial portion of aluminium with it. This may be effected in a single bath if the current be diminished from time to time, or it may be carried out by causing the molten crude chloride to pass through a series of baths in which it is exposed to a series of electric currents of decreasing quantity suitable to produce the above effect, it being kept in motion throughout the process. In this arrangement it is not necessary to vary the quantity of the current in each bath, as the required object is attained by using a series of baths.

The quantity of the current at each stage will depend upon the amount of iron remaining to be deposited.

Correspondence.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Sir,—Please insert corrected list of subjects as under:—

October 16th.—"Stereoscopic Photography."

October 23rd.—"Preparation of Dry Plates," Mr. Prestwich.

October 30th.—"Pictorial Definition," paper by Mr. W. E. Debenham.

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

95, *Blenheim Crescent, October 6th.*

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Sir,—I am requested to state that the judges have awarded a medal to Green, Cross, and Bevan, for their exhibits of Diazotype Printing; also to Andrew Pringle, for Photo Enlargements.

Edwin Cocking, *Assistant Secretary.*

5A, *Pall Mall East, S. W., October 7th.*

"A WARNING!"

Sir,—It is my unpleasant duty to call your attention to a theft of lenses which has just been perpetrated at my establishment, and I trust that my mentioning the case may serve as a protection to some of my photographic brethren. At the same time it may, perhaps, lead to the recovery of the missing articles.

A few days ago I took pity upon an individual who called in answer to an advertisement for a printer, answering my question regarding references with the plausible story of his having had a quarrel with his family, who were in business as photographers in Huddersfield and elsewhere. He said that he thought to find it easy to obtain work in London, but had been unsuccessful during a search of several weeks. This morning he rewarded my confidence by depriving me of his services and a couple of large portrait lenses, one of which was stamped Lerebour and Secretan (half-plate), and the other a rather larger-sized *whole-plate lens*, cone-shaped and wider at one end. The man was rather good-looking, of respectable appearance, and good address. His face and neck were very florid; his hair and moustaches red. He had evasive habits. The police have been communicated with.

J. Hubert.

238, *Mare Street, Hackney, London.*

Proceedings of Societies.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 2nd.—Mr. A. HADDON in the chair.

The subject for discussion was "The Keeping and Testing of Sulphite of Soda."

The CHAIRMAN said every photographer must be interested in the subject. It was only by having a knowledge of the chemicals they were using that photographers could contend successfully with any difficulties that might arise. He introduced to the members Mr. J. C. Belcher, M.S.C.I., who read a paper on the subject (see p. 780).

The Lecturer illustrated his paper by various experiments, commencing with sulphurous and sulphuric acids. A piece of sulphur was burnt over a solution of sulphite of soda in a bottle—to which barium chloride had been added—afterwards using the solution to write on a piece of paper. The paper being held over a spirit lamp, the sulphurous acid was driven off, leaving sulphuric, which proved its presence by the charring of the letters on the paper. Several experiments were then made in testing sulphite and sulphate of soda, by adding hydrochloric acid to a solution of sulphite of soda and barium chloride, sulphite being soluble in hydrochloric acid, but not sulphate. A delicate test was shown for the detection of the presence of carbonate, by adding to a solution of sulphite phenol phthaleine. The solution would change to a bright pink colour if only a trace of carbonate were present. The preservation of sulphite was next dealt with. This was effected by keeping the crystals of sulphite in ether. The Lecturer showed a sample of sulphite in ether that had been kept in the bottle six months; sulphite in solution could be kept by floating rectified benzoline on the top.

Mr. A. COWAN asked whether, in testing a solution of sulphite with phenol phthaleine, the depth of colour of the solution would indicate, to some extent, the quantity of carbonate present.

Mr. J. C. BELCHER thought not. He showed a sample of sulphite which contained 2 per cent. only of carbonate; the usual quantity generally present in sulphite was from 5 to 6 per cent.

The CHAIRMAN spoke of the value of the hints that had been given in the paper that had been read before the meeting, especially with regard to the preservation of sulphite, expressing a hope that Mr. Belcher would favour the members with a further contribution on the chemical side of photography at an early date.

This Mr. BELCHER promised he would do.

M. ROBERT showed a new developer; it was in one solution. He claimed for it that it was a very energetic developer. M. Robert subsequently took some photographs of the members present, for the purpose of demonstrating the power and efficiency of his flash-light apparatus.

Mr. T. E. FRESHWATER passed round an album of prints from negatives taken at his various outings during the summer.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THIS Society met for the first time at Hanover Hall, Rye Lane, S.E., on Friday, October 3rd. Five members were elected and three proposed, after which an excellent series of slides (the work of Messrs. Boydell, Esler, Collins, and other members) was shown. Amongst them was a series taken with the "Ideal" hand-camera, which created much amusement. Some well-executed microscopical slides were also exhibited.

The lantern was lent and worked by Mr. Bauks, the treasurer.

ENFIELD CAMERA CLUB.

A MEETING was held at the Lancaster Coffee Tavern, Silver Street, Enfield, on the 1st inst., Mr. PINKNEY in the chair.

The photographs of the monthly competition were exhibited.

It was resolved that the next field day be held on Saturday, 11th inst.; members to start from the Lancaster Coffee Tavern at 9.30 a.m., and proceed to Nether Hall, near Broxbourne.

Answers to Correspondents.

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

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

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

ENAMEL.—Your's is hardly a photographic question. We have no technical knowledge of the materials employed in glazing enamelled iron plates, beyond the fact that powdered felspar is a chief ingredient, and that the enamel coatings differ greatly in their power of resisting acids and corrosive chemicals, according to the nature of the fusible composition and perfection of its attachment.

E. and S.—*Photographs of Samoa and Fiji, Animal Studies, &c.* We have not seen the new series of Samoan photographs mentioned in your second letter. With regard to Mr. Gambier Bolton's animal studies, besides the horse and lion of last year you will find a dog and three kittens now in the Pall Mall Exhibition—catalogue Nos. 347 and 389.

A. C.—*Retouching by Night.* The best hint we have to give you is a recommendation to employ a pale blue glass to counteract the yellow tinge of artificial light by which you propose to work; this makes it less trying to the eyes. The use of ground glass or rice paper is unnecessary unless you are working upon very thin negatives.

MEDALLIST.—*Further Awards at the Exhibition.* In the scientific department two medals have been given; one to Messrs. Green, Cross, and Bevan, for their Diazo-Primuline process, and the other goes to Mr. Andrew Pringle for his micro-photographs of bacteria. These will be notified in the corrected edition of the catalogue.

A. W.—*Primuline Materials.* The new dye, primuline, together with the developers, red, purple, orange, yellow, and brown, also nitrite of soda and acetic acid, are procurable from Messrs. Brooke, Simpson, and Co., Atlas Works, Hackney Wick, N.E. The process is not a difficult one; on the contrary, quite simple, and easy of execution.

W. L. (Bandoeng, Java).—*Watkins' Exposure Meter.* This instrument is figured on page iv. of last week's NEWS, and is now being shown as one of the novelties in the Pall Mall Exhibition. It will come in for notice amongst the apparatus, and so far as the nitrite paper is reliable, it promises to be the best in the market. Can you stimulate the action of your instantaneous shutter by an additional elastic band, as is possible with Sands and Hunter's? See report on page 775, and reference to the fact that twenty or thirty different forms are now before the public, making it a very difficult task to say which is best! Kershaw's has been recently improved. On other points we will make further enquiries, and communicate again next week.

A. M. M.—*Graphic Inks.* We are sending you two samples of permanent black for trial, and shall be glad to know whether either of them answers your purpose. If so, we will give you fuller particulars.

LUX MINOR—*The Weather.* The month of September, indeed the last six weeks, may be said to have redeemed the character of the past summer; warm and genial, with glorious sunshine, and less rain than for many years (only about one inch), photographic operations must have been very greatly facilitated, and out-door exposures rendered almost a matter of certainty. We never remember a better season for photography, and let us hope it will result in much good work having been accomplished within this later period.

F. C.—*Mounting in Albums.* It is often difficult to ensure flat mounting of photographs in albums. Before laying down the pasted photo you ought to pass a moistened sponge over the face of the paper or card upon which it will be in contact. Lay a sheet of blotting paper between each page, and allow to dry slowly under pressure.

ALBUMEN.—Received, and will be answered in our next. For private address, see head of this column.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1676.—*October* 17, 1890.

CONTENTS.

IS ALBUMEN PAPER DOOMED?

In spite of the oft-repeated and, unfortunately, true charge of want of permanence, the silver picture on albumenised paper still represents the most common method of printing from a photographic negative. We need not seek far to trace the reason for this apparent recklessness in employing a servant of such treacherous disposition. The process of printing on albumenised paper is so easy that a mere child can be taught to look after the printing-frames, besides which it has the still more laudable quality of cheapness. Since manufacturers have turned out ready-sensitised paper of good quality at a price at which it could hardly be prepared by the worker himself, the method of printing on albumenised paper has had an astonishing impetus given to it, and other methods of printing have naturally been neglected.

This last statement may be questioned by those who only judge of the relative popularity of different processes by the pictures seen at our exhibitions. They look around the walls of such an exhibition, and remark at once that the familiar warm tones of the silver print are all but absent, and that they are replaced by the greys and blacks due to bromide paper and to platinum. Even the silver prints themselves are under a disguise since it became the fashion to tone them with platinum instead of gold. Other strange processes are also represented by a few experimental photographers, but the general conclusion arrived at is, that the silver print on albumenised paper is fast being relegated to obscurity.

But the exhibition gallery is not the place to form a correct judgment regarding such a reformation. We should get far more reliable information by seeking it from those who prepare or who sell sensitised paper; and they would probably tell us that, in spite of bromide, platinum, and all the other new-fangled things, silver prints are still as common as daisies. If they are as ephemeral as those flowers of the field, it matters not to either the producers or the public. The first have their living to make, and competition has so cut down prices that they cannot pause to enquire whether the pictures which they issue to a confiding public will be as lasting as the pyramids, or whether they will fade before another year has passed away. They do their best by copious washing and by choice of good materials to ensure permanence, and they can do no more. Of course these men are the struggling members of the photographic fraternity, for we know well that those who have deservedly won first places in the race for existence will, by careful experiment, be careful to leave no stone unturned to render that which comes from their studios as permanent as possible.

The public cares little to enquire whether a picture will be permanent or not, for few of them look beyond the present. They like the portraits to look well, and expect them to last for a reasonable time, and, provided that they do this, satisfaction is secured. Now and then a case occurs where death comes in suddenly, and then the fading of a particular portrait is deplored, but, as a rule, the fading of pictures, possibly long after the course of events or lapse of time has engendered or lessened interest in the original, is taken with equanimity.

Those photographers who compete for prizes at our exhibitions are somewhat differently placed to those whose circumstances confine them to the same well-worn ruts year after year. They mostly wish to show prints from pet negatives which have been taken expressly for exhibition purposes. They know that prints in platinum are permanent, and they are aware that the matt surface of such pictures, if not fully appreciated by the general public, commends itself to artists, and at least one artist is sure to be on the list of judges; so that the proportion of platinum prints at an exhibition is not a fair guage of the general adoption of platinum in lieu of silver printing. We would that it were otherwise, but we fear that the use of the more permanent metal will be checked, instead of increased, by the recent extraordinary rise in price of the raw material.

The old question of £ s. d., indeed, must, for a long time, determine this matter, as it rules most other things where advance and improvement are called for. The public are, at the present time, mad on the subject

of cheapness; the store system has demoralised them. Quality, permanence, and everything else must give way to that fixed idea, except among the few who are educated up to higher considerations. So that, in spite of fresh processes, some of which are most promising in the results which they afford, the silver print holds its own, and simply because it is the cheapest to work.

We have, perhaps, been unfair to the old process in writing of it as if it were bound, in time, to give pictures which are evanescent; but our readers will know that we do not wish to convey this idea. We have silver prints—some, too, with obscure names printed on their backs—which are beautifully fresh in appearance, although taken twenty-five years ago. Others, with well-known names, not so old, are dying fast of yellow fever. No one yet has satisfactorily solved the riddle represented by these vagaries of silver prints, but all agree that they are most uncertain in their behaviour.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

In endeavouring to arrive at a clear idea of the value of the Photographic Exhibition as a record of progress, one naturally seeks to make some sort of classification. But this is difficult to do. There are portraits at the one end of the scale and landscapes at the other. Between these two extremes any number of variations exist. When Mr. A. Keighley, for instance, calls his capital little picture "Who's Coming" (No. 5), does he mean it to be judged as a landscape, as a group of figures, or as an attempt at telling a story? Mr. Ralph Robinson frequently is puzzling in this way, while the portrait men, with in-door effects, are fond of suggesting the same uncertainty. The point is not important, save that it renders arrangement into classes almost impossible, and one is perforce obliged to take the pictures in the order of the catalogue as the simplest way of proceeding.

There is, however, no need for hesitation in deciding what Mr. J. Gale means. He is a landscape man of a thorough type. A flock of sheep is the most prominent object in "Through the Driftway to the Fold" (No. 18), but sheep and cattle may almost be considered as component parts of a landscape, and in this case the sheep certainly add to its charm. The same remark may be applied to "The Ferry" (No. 32). Here are two figures, but they are admirably in keeping with the scene, and subordinate to the general effect. The composition of the picture as a landscape is what Mr. Gale aims at, and he succeeds. All his work is marked by the taste, refinement, and delicacy of workmanship to which Mr. Gale has so long accustomed us, though it may be said that this year he has not been quite so happy in the choice of subjects. One pauses before differing from so skilful an artist, but I am tempted to ask whether his skies are not sometimes too heavy and pronounced. They have a way of suggesting an impending storm, all very well when this idea is intended, but rather confusing when not.

One of the most striking features of the present Exhibition is the fact that, despite the number of artist photographers who have grown up in recent years, Mr. H. P. Robinson more than holds his own with the best. Indeed, in some respects he has excelled himself, and rarely has he shown to such advantage as in the present Exhibition. In "A Strange Fish" (No. 26), representing an old fisherman on the seashore showing to a couple of wondering children some uncanny occupant of the deep which has found its way by chance into his net, Mr. Robinson displays his old skill in telling a story effectively. "Against the Wind—a Race with Grandad" (No. 109) is also a scene on the seashore. I am not certain, however, whether the picture would not have been improved by the excision of the girl in the distance whose skirts cling to her in rather ungainly fashion. The two principal figures are full of life and "go," and withal natural. Mr. Robinson has done nothing better in the way of landscape work than in the series Nos. 358 to 363. His ripened experience has enabled him to guage accurately what a photographer may attempt with success. He wisely contents himself with more simple materials than in years past, and to the greater advantage of his work, and the greater pleasure of his critics. It is needless to say that Mr. Robinson, officiating as one of the judges, is precluded from obtaining that recognition to which his pictures are emphatically entitled.

Mr. H. F. Knight gives us some charming examples of pure landscape in his "Views in Switzerland" (No. 27). Mr. H. Tolley shows a fine work in Lake Killarney (No. 30), and in a series (Nos. 396 to 403), in which his medal picture figures. Mr. Tolley is one of the few men who can deal satisfactorily with large masses of sea and sky. The subjects he chooses are those which the ordinary photographer fights shy of, as "bits" are so much easier than panoramic expanses; hence Mr. Tolley's success is all the more praiseworthy. A view of the street in Zaandam, where Peter the Great lived as a shipwright (No. 36), by Dr. Lindsay Johnson, is extremely interesting, and a capital piece of photography in addition.

Mr. Lyddell Sawyer is irritatingly unequal in his work. His "The Smoky Tyne" (No. 324), so suggestive of Mr. Wyllie's studies of shipping, is as fine as anything in the gallery. His "Crewell Work" could not easily be matched for badness; it is neither interesting nor intelligible, and the weak pun in the title does not make up for its deficiencies. He is fairly successful in his pictures of Newcastle street life; but a little of this goes a long way. As an example of clever grouping, his "Rare Old Gossips" may be commended; but no one can feel much interested in such deplorably ugly women. Is his "In the Prime of Summer Time" (No. 186) a challenge to William Collins' well-known picture, "As Happy as a King"? The photograph is marked by much cleverness, but what should be an important focus of attention—namely, the figure of the child who has fallen—is only to be discovered by accident. Mr. Sawyer shows no less than twenty pictures of large size, and one can only regret that he did not exercise a little judicious thinning out. The demon of fatal facility seems to beset Mr. Sawyer; he is so clever, it is no trouble for him to make a score of pictures of fair merit; but more is expected of Mr. Sawyer than this. Like Mr. Ralph Robinson, he exhibits too much.

Mr. W. T. Kimberly shows some clever examples of winter scenery in Nos. 41 and 273, and Mr. T. M. Brownrigg's pictures of the Spanish Alhambra and of the Alcazar, Seville, should be looked at with great interest. Most of Mr. Brownrigg's work, however, lacks vigour, due, probably, to the printing rather than to the negative. Mr. William Bedford always maintains a standard level of excellence. His "The Mirror of the Woods" (No. 52),

"Dowu Dale" (No. 92), "Stream and Woodland" (No. 93), and "Amongst the Woods aud Waters" (No. 304), are all admirable examples of his paiustaking if undemonstrative style. Mr. W. Bedford is emphatically a "safe man," and oue does not look for startling innovations from him.

Mr. G. Davison's medal picture has already been mentioned. He shows a nnmber of other pictures which also exemplify what has been called the "new school." I am inclined to think that, taken as a whole, they will excite more controversy than unanimous admiration. One would like to know whether the title of "A Breezy Coruer" was bestowed upon the picture because the wind was blowing at the time when the photograph was taken, or whether the woolly effect produced by the want of sharpness and the drawing paper combined suggested it to Mr. Davison. One little fact may be noted: the boat in the centre of the picture is quite as breezy as the trees. How comes this about?

Cattle are well represented in the Exhibition; indeed, most of the landscape photographers have availed themselves of these extremely useful sitters. Miss Florence Harvey, who seems to have bovine tastes, shows a good series of studies, of which No. 11 strikes me as the best. In her study of "Highland Sheep" (Nos. 127, 128, aud 129) is a somewhat mixed effect, especially in No. 128, the large stones being themselves so much like sheep.

Mr. A. B. Hepburn deserves commeudation for his picture, "On the Tramp" (No. 82), which, however, lacks feeling, as the tramp is obviously standing to be photographed.

"A Harvest by the Sea" and "St. Margaret's Bay" (Nos. 112 and 113), by Mr. Francis Cobb, are well selected views of well-known spots, of which, to my thinking, the first is the best. Messrs. West and Sons continue in the path in which they have gained so many laurels. They are less prolific than of yore, but their pictures are quite as good. Mr. H. Symonds is also represented by work about which nothing new can be said.

The clever series by Mr. Shapur N. Bhedwar, illustrating the Feast of Roses, has already been noticed in speaking of the medal awarded to No. 185. Mr. Bhedwar's careful, delicate style is also seen in a picture to which he has given the title of "Granny's Comforts" (No. 168), and more especially in "La Tambourine" (No. 463). Mr. Bhedwar shows a degree of individuality which promises much for the future, and his progress will be watched with much interest.

Some clever pictures of Jersey scenery (Nos. 143 and 144) are exhibited by Mr. A. R. Dresser, but Mr. Dresser's most striking contribution is seen in some instantaneous pictures of leap-frog. The odd peculiarity of instantaneous work is well shown in these pictures. Although we know that the boy in the act of leaping is moving rapidly through the air, yet the effect is not that of motion. It only shows what has been said over and over again, that instantaneous photographs, whether of human beings or animals in motion, are altogether unnatural, and are really of little use to artists, who want to suggest a combination of movements, rather than one movement petrefied, so to speak. This, however, does not take away from the merit of Mr. Dresser's dexterity. Mr. Robert Slingsby is not quite so happy in his "Idle Hours" (No. 159) as in some of his former efforts. The figure seems swamped by the surrouudings. Were the picture cut down to about a third of its present size it would gain much in effect. Mr. Slingsby has been so successful in flash-light photographs that one naturally looks for something from him in this direction; but he exhibits no pictures of this, the latest curiosity in portrait photography. There are one or two examples of flash-light work which it may be convenient to mention here, but they are not remarkable. One is by Mr. F. Downer, described as "Flash-Light Group of Young Ladies at a Ball" (No. 4). Whether it is the fault of the flash-light or not I cannot say, but all the young ladies look exactly the same in figure and feature. Their unanimity is wonderful. It cannot be described as a pleasing picture. Mr. Downer also shows other examples in No. 486.

IODIDE OF NITROGEN.

BY F. H. VARLEY, F.R.A.S., M.I.E.E.

I am induced to write upon this compound, being stimulated by an article in a daily journal in reference to its employment as a measurer of the actinic values of light. The paragraph which I here append concludes with the sentence, "Precautious are taken to prevent heat effects."

With the increase in the means of obtaining artificial light, the need for an improved means of comparing their various intensities has increased also. The common photometer, with its fixed "standard candle" and its sheet of paper with a centred disc, depends much on the care and skill of the observer for its practical value. A new form is announced, in which the readings can be taken as readily as comparing two thermometers. It is based on the decomposition of iodide of nitrogen by light. There are two vessels with glass bottoms, close side by side, equal in size. Iodine and ammonia solution are put in each, forming the iodide of nitrogen, which remains unaltered so long as it is in the dark. The two lights to be compared shine by a mirror each up into one of the vessels. The amount of nitrogen gas given off each is collected in a tube above in ammonia water, and the relative height shows the relative activity set up by the light. Precautions are taken to avoid heat effects.

It is this last remark which tickles my fancy, and causes me to write my experience. I prepared a few grains of the iodide in the usual way by placing some iodine flakes in ammonia, and, after the reaction, poured off the excess of ammonia. Attending to other things, I forgot for the moment that I had made the preparation. I came again into the room, and started pounding up some calcined caustic soda, when one of the fragments knocked off by the pestle lodged in the beaker containing the iodide of nitrogen. The sudden heat set up was sufficient to cause an explosion. The beaker and its contents went "scat!" The zone of bombardment was directed toward the end wall, which, not being at right angles to the front of the building, but inclined at an angle of 25° to 30°, focalised the zone of explosion. The floor was literally strewn with separated particles of the unexploded iodide of nitrogen, and a few minutes after this catastrophe it was impossible to walk about without producing a minor explosion for every step that was taken. These explosions, though not very pronounced, were sufficiently startling, and might be compared to treading upon the head of an ordinary lucifer match. I took the precaution of sprinkling sand over the floor, and, by sweeping it to and fro across the boards, succeeded in discharging the remaining particles, when all was apparently quiet. I considered that no farther explosions were possible, but the next day the foreman went to the pigeon holes fixed against the end wall to take out some brass castings. He took one weighing about three-

quarters of a pound; in so doing, he rubbed an unexploded portion of iodide which had lodged on the castings, with the result that a fresh explosion ensued, as startling as it was unexpected. He looked at the casting with blank astonishment for a second or two, and then, by muscular action set up by the reflex action of the brain, he jerked it upwards, striking his face and causing the blood to flow. When I asked him what he did it for, he maintained that it was shot up by the explosion. He was evidently too startled to to be aware of the fact that immediately after the detonation the casting was resting quietly in his hands. For some days afterwards, upon removing sheets of drawings, it was impossible to dust them without setting free detonating particles, although the iodide had been exposed to the action of full daylight during that time. Now, should it be found that iodide of nitrogen liberates gas by the action of light, and that nitrogen thus set free is a true measure of light values, it is well to bear in mind, to prevent *contretemps*, that, although iodide of nitrogen is not so powerful an explosive as the chloride of nitrogen or fulminate of silver, it is, nevertheless, most distinctly explosive, and in quantities would prove highly destructive; it therefore requires careful handling. Should, however, the reader try these experiments, I would advise his making the preparation out of doors, and, if mischievously inclined, to spread it, while wet, upon a wall, and allow it to dry, where cats do mostly pass, where it will cause some astonishment to the feline species, as the softest touch of a feather, or the pressure of grimalkin's paw, will produce a real good, startling explosion not calculated to do the animal any grievous bodily harm, but quite sufficient to scare the poor creature and upset its imperturbable equanimity.

THE OPTICAL ASPECT OF "NATURALISTIC" DEFINITION.

BY W. E. DEBENHAM.

When writing* on some criticisms originated by Mr. W. K. Burton's article, "Sharp All Over," in the Year-Book of 1890, the question of submitting one's own judgment to that of artists, even against all arguments that could be advanced, was left for future consideration.

The reason that artists often condemn sharpness whilst, as Mr. Burton says, no satisfactory argument can be adduced against it, is probably to be found in the fact that the word sharp, as applied to pictures, is used with very different significations by artists—by which term it is intended to refer to painters and draughtsmen—and by photographers. I have heard a painter condemn a photograph as too sharp that, in reality, was not what a photographer understands as sharp at all. The photograph in question was an under-exposed portrait with sudden lighting, and the effect was to render the shadows crude, and what is called cutting, both against the background and against what should have been the half-tones of the face. The fine definition which is what a photographer recognises as sharpness, and which was absent, partly owing to movement or defective focus, and partly to the forcing of such definition as was in half-tone either into the heavy shadows or chalky lights would, if present, have actually prevented or reduced the harshness that was condemned by the painter as sharpness: harshness, in fact, and not fine definition, was the quality which was referred to as unpleasant sharpness.

Without now going into the question as to whether, in some cases, a more agreeable picture may be produced by losing detail, I propose to deal with the statement that an effect more accordant with what is produced upon the human eye by the natural objects represented in the picture, is obtained by the use of such large diaphragms as to throw part of the picture decidedly out of focus. One answer that is frequently given to this proposition is, that the eye has power of adjustment, and can see any portion of the subject it looks at in focus, and that if we do not obtain the best focus upon the photographic plate, we are robbing the eye of the privilege which it possesses when looking at the original subject. If, for the moment, this reply be waived, and it is admitted that we ought only to represent in the picture what the eye sees at any given fraction of a second, the question arises, what is the sort of diaphragm that ought to be used in order to render objects in different planes, when one plane is sharply defined, with the same amount of distinctness that belongs to them when they are seen by the normal human eye without allowance for power of adjustment?

If the answer to this question could have been foreseen by those who support the statement that, for the effect referred to, the small stops ordinarily in use amongst photographers should be replaced by larger ones, it is probable that they would never have ventured upon such a proposition. The matter is an optical one, and depends upon a law which I have found to be received by most photographers with surprise, and even incredulity. The law is, that the definition of the out-of-focus planes depends, not upon the proportion of the diaphragm or aperture to the focal length, but upon the absolute size of the aperture itself independent of the focal length. By equality of definition of out-of-focus planes, it is meant that the indistinctness or circle of confusion of any point in the subject will reach as far as the same adjacent point in the cases to be compared. This will give, when the photographs are looked at at a distance equal to the focal length of the lens, or are enlarged or diminished to any fixed proportion to the original, pictures identical in the amount of indistinctness.

When this optical law is understood, it is seen that we need not go into the question of the focal length of the human eye, or of the lens to be used. We have only to ascertain the size of the aperture of the eye (which is estimated to be, out of doors in a good light, about one-eighth of an inch), to find that that is the size of the diaphragm with a lens of any focus that will give, when one plane is sharply focussed, the out-of-focus planes with as much indistinctness as they possess to the human eye, deprived, to suit the "naturalist" contention, of the power of adjustment. If, therefore, the argument is admitted that the lens ought not to define out-of-focus planes more sharply than the eye sees them, that argument would only apply to those cases where diaphragms are used smaller than that of the eye. Thus, so far from having to use larger stops than those commonly employed by photographers, it is evident that, to represent the limited amount of want of definition in the out-of-focus planes, as impressed on the retina, it will be necessary to use such small stops as with long, or even medium focus lenses, necessitate a length of exposure that would, in many cases, be found impracticable.

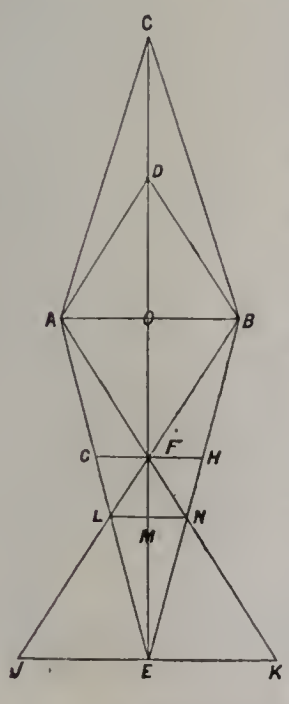
* "Spherical Aberration and the Treatment of Subjects by Focus."—Photographic News, August 22nd, 1890, p. 646.

It was not intended, in the present article, to do more than show the hollowness of the contention—founded upon a want of recognition of the optical laws governing the amount of indistinctness of out-of-focus planes—that large stops give definition more nearly representing that amount than do small ones. It may, however, be mentioned, for the comfort of those who have been aiming to produce the most perfect photographic work in their power, but have been discouraged by being told that what they aim at is artistically condemned, that the *practice* of artists is in favour of finer definition in the various planes than it is easy to obtain by photographic means in any but planes in the focus or closely adjacent to it. As instances readiest to the hand of photographers at this season, may be mentioned the reproductions of paintings in the present Exhibition at Pall Mall. Probably that of the painting by Edwin Long, R.A., "Diana or Christ?" will be recognised as the most important. Here the definition of several figures in different planes, behind the leading female figure, is in each as fine as it would be in a photograph if they were taken separately. Note the man holding the Act of Accusation, and the parchment that he is holding: also the hand on his shoulder, and the faces, two or three of them, behind. See also the face of the seated figure on the left, the statue of Diana behind him, and the face behind that. Observe, indeed, all the faces that are large enough to be seen with any distinctness, and then say whether, if they had been arranged for a photograph, it would have been practicable to get them focussed as sharply as they here appear, without the use of such a small diaphragm as to be out of the question. Similar observations may be made with respect to the "*Al Fresco* Toilet," by Luke Fildes, and many others. The pure landscape (No. 501) by R. W. Leader, A.R.A., might, no doubt, be rendered similarly well defined in a photograph, but only by the use of a very small diaphragm.

ON THE DIFFUSION OF FOCUS.

BY N. E. DUNER.

The question about the depth and diffusion of focus has been treated of in different manners. The following generalisation of the problem might perhaps be of some interest.



Let C and D be luminous mathematical points, and A B a stop in the centre of a photographic lens; let F and E be the points into which the rays starting from C and D respectively are collected by the lens, and put:—

$$CO = D_1;\ DO = D;\ AB = d;\ OF = F;\ OE = p_1.$$

It is now evident that one can choose different positions of the photographic plate. Let

(1st.) This position be in G H. In this case, C will be represented by the point F; cut D by a circle, whose diameter is G H. Put G H $= x$, then

$$x : d = p - F : p;\quad x = d\left(1 - \frac{F}{p}\right)$$

But if f is the focal length of the lens, we have

$$\frac{1}{f} = \frac{1}{D} + \frac{1}{p} = \frac{1}{D_1} + \frac{1}{F}$$

whence,

$$p = \frac{FDD_1}{DD_1 + DF - D_1F}\qquad F = \frac{D_1 f}{D_1 - f}$$

Introducing these values in the expression for x, one obtains readily—

$$\left.\begin{aligned} x &= d \cdot \frac{f}{D} \cdot \frac{1 - \frac{D}{D_1}}{1 - \frac{f}{D_1}} \\ d &= x \cdot \frac{D}{f} \cdot \frac{1 - \frac{f}{D_1}}{1 - \frac{D}{D_1}} \end{aligned}\right\} \quad \ldots \quad \ldots \quad \ldots \text{ (I.)}$$

(2nd.) One can place the plate in J K, whence the point D will be represented by the point E. Cut the point C by a circle whose diameter is J K $= y$. But

$$y : d = p - F : F,$$

whence, by introducing the above values of p and F,

$$\left.\begin{aligned} y &= d \cdot \frac{f}{D - f} \cdot \left(1 - \frac{D}{D_1}\right) \\ d &= y \cdot \frac{(D - f)}{f} \cdot \frac{1}{1 - \frac{D}{D_1}} \end{aligned}\right\} \quad \ldots \quad \ldots \text{ (II.)}$$

But it is evident that neither G H nor T K will be the most favourable position, but that one will have the least possible diffusion by

(3rd.) Placing the plate at L N. In this case neither C nor D will be represented by a point, but both by a circle, whose diameter is L N. Put: L N $= z$; M F $= s$. Then we have—

$$\left.\begin{aligned} s &: p = z : y \\ p - s &: p = z : x \end{aligned}\right\} \text{ whence}$$

$$z = \frac{1}{\frac{1}{x} + \frac{1}{y}}$$

and by (1) and (2)

$$\left.\begin{aligned} z &= d \cdot \frac{f}{2D - f} \cdot \frac{1 - \frac{D}{D_1}}{1 - \frac{f}{(2D - f)} \cdot \frac{D}{D_1}} \\ d &= z \cdot \frac{2D - f}{f} \cdot \frac{1 - \frac{f}{(2D - f)} \cdot \frac{D}{D_1}}{1 - \frac{D}{D_1}} \end{aligned}\right\} \quad \ldots \text{ (III.)}$$

It is evident that z is smaller than x and y. Putting in the expressions (1), (2), and (3), D_1 infinitely great, one will have—from (1):

$$d = x \cdot \frac{D}{f} \quad : \quad D = \frac{f\,d}{x} \quad \ldots \quad \ldots \quad \ldots \text{ (IV.)}$$

which are the formulæ published, for instance, in the "Hand-book" of Pizzighelli, Part I., page 141. From (2) we find—

$$d = y \cdot \frac{D - f}{f} \quad : \quad D = \frac{f(d+1)}{y} \quad \ldots \quad \ldots \text{ (V.)}$$

which are the formulæ given by Mr. Burton in the PHOTOGRAPHIC NEWS, No. 1659, p. 473, where, however, the ex-

pression for d is vitiated by a misprint, as one will find, by deducing d from the expression for D. Finally, the equation (3) gives—

$$d = z \cdot \frac{2D - f}{f} \quad ; \quad D = \frac{f}{2}\left[\frac{d}{z} + 1\right] \qquad \text{(VI.)}$$

The formula (3) being evidently the most advantageous. I have also deduced the value of the distance, $F + s = \Delta$, between the plate and the stop by means of this equation, and I have found

$$\Delta = f\left[1 + \frac{f\left(1 + \frac{D}{D_1}\right)}{2D - f\left(1 + \frac{D}{D_1}\right)}\right] \quad \ldots \quad \text{(VII.)}$$

By means of this equation, one can deduce the distance from the stop in which the plate must be placed in a camera without focussing adjustment, in order to have the greatest possible distinctness for all objects between the distances D and D_1. Putting D_1 infinitely great, one will have—

$$\Delta = f\left[1 + \frac{f}{2D - f}\right] \ldots \quad \ldots \quad \ldots \quad \text{(VIII.)}$$

(*To be continued.*)

LUNAR PHOTOGRAPHY.

IN last week's *Nature*, Mr. R. A. Gregory gives a concise history of lunar photography, and makes the following remarks about recent results:—

"In a recently published paper on 'Astronomical Photography at the Lick Observatory' ('Publications of the Astronomical Society of the Pacific,' vol. ii., No. 9), Prof. Holden gives a detailed account of the photographic apparatus of the great equatorial, and the work done with it. The image of the moon in the first focus of this instrument is nearly five and a quarter inches in diameter, and the negatives bear easily an enlargement of 570 diameters, and even double this amount. In the production of these negatives the aperture of the object-glass was reduced to 12 inches. From an examination of the best pictures yet taken at the Lick Observatory, Prof. Holden finds that parallel walls on the moon whose tops are no more than 200 yards or so in width, and which are not more than 1,000 or 1,200 yards apart, are plainly visible. A series of copies from the negatives obtained at Lick Observatory has been published.

"Some photographs of the moon taken in March last, by the Brothers Henry, at the Paris Observatory, appear to eclipse all previous ones. The instrument used was the 13-inch photographic equatorial, and an examination of the plate which accompanies this note will show that real progress has been made. The superiority of the results is due not only to the perfection of the object-glass, but to the use of a secondary magnifier, by means of which the size of the image at the first focus was increased fifteen times. It is manifest that this method of direct enlargement possesses many advantages over that ordinarily used, and its further development will be awaited with considerable interest."

THE Catford Cycling Club announces a grand "camera" concert to be held at the Bridge House Hotel, London Bridge, on November 4th, at which the exhibition of lantern slides will comprise a selection of cycling scenes, under the headings of "Road Riding," "Racing," "Touring," "Goodfellowship." The lantern entertainment will be under the superintendence of Mr. Herbert Smith. The chairman and lecturer will be Mr. C. W. Nairn.

APPARATUS AT THE PHOTOGRAPHIC EXHIBITION.

II.

FIG. 7 represents a developing-dish rocker exhibited by Messrs. Lewis and Co.; it is driven by clockwork, and its motive power is a coiled spring. When weighted with a small developing dish and plate, it will run for about half-an hour, and not with an objectionable amount of noise, such as is sometimes given by instruments of this class. The table on which the dish rests might conveniently be made larger and fitted with a cover of little weight, so that light can be excluded from the dish and its contents. The motion, especially at first, is somewhat more rapid than is theoretically necessary or desirable; it is regulated by a fan governor. Rocking tables like that of Sir David Salomons run noiselessly and for a much longer time. For purposes of experimental research, a clockwork rocking table which would run for twenty-four hours without attention, and include the power of excluding light from the sensitive salt, would sometimes be of considerable utility. The advantages derivable from clockwork mechanism in the driving of rocking-tables, come in at their best when motion is required extending over long periods of time; such tables would sometimes be exceedingly valuable for purposes of original research.

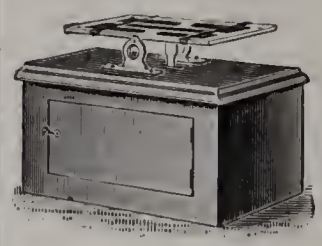


Fig. 7.

Messrs. Lewis & Co. also exhibit a simple device, fig. 8, to prevent tripod legs sliding on slippery floors. A cord can be affixed to each leg by a clamp, and under the centre of the head of the stand the three cords hold in suspension a light piece of brasswork, so pierced with suitable holes that the operator can make it grip and hold each cord where he pleases.

Fig. 8.

Fig. 9 represents one of Messrs. Marion & Co.'s new tripod photograph stands with a triangular glass and frame. This simple device may possibly please the public, and if so it will come into general use.

Fig. 10 represents a shutter exhibited by the same firm, and invented by Mr. Bain. It works between the lenses, and is actuated by strong springs, which cause two suitably shaped "jaws" to cross each other, and, in so doing, to make the exposure. The springs can be tightened for more or less rapid exposures by means of the lever arms A A, which, near their upper ends, can be placed in different

Fig. 9.

indentations in two curved strips of brass, shown in the cut. The shutter is set by drawing down the

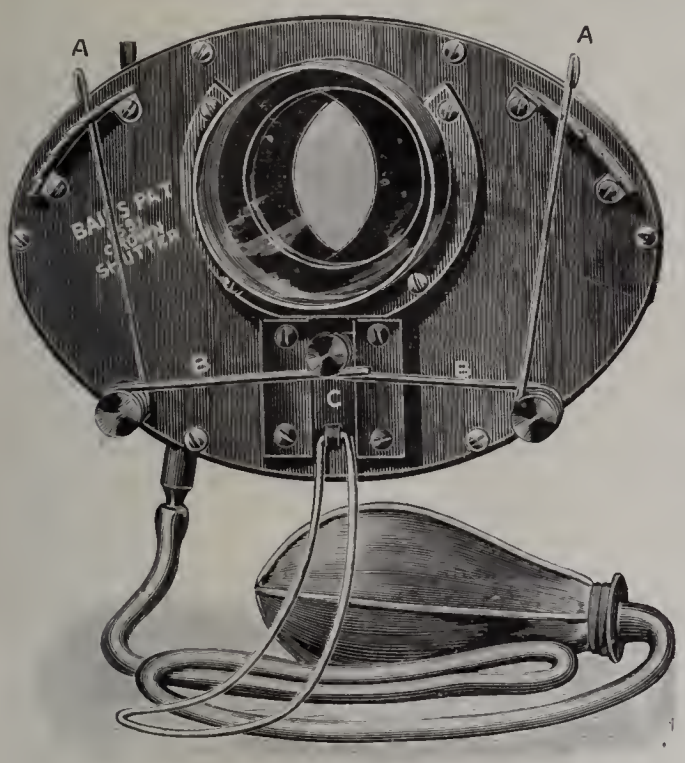


Fig. 10.

string loop below C. The arms by which the actuating pin is driven up in its slot are represented by B B. It has an arrangement for giving time exposures at will. The pneumatic release is of the ordinary kind, as depicted in the cut. When high tension is put upon the springs the action of this shutter is extremely rapid.

*** *Those friends who have not yet sent in their* Year-Book *articles, are requested to let them reach us on or before Tuesday next.*

Osmium Toning Baths.—Herr Liesegang has been making some remarks concerning the osmium toning bath recommended by M. Mercier, and of which we gave an account some weeks ago. This is what he says:—"The toningsalt consists essentially of ammonium-osmium, chloride, and acetic acid, and is fit for use on simple solution in water. On immersing in the bath a washed-out silver print, it first assumes a brown tinge, after which the half-lights tone a deep azure blue. Aristo paper tones deep blue-black when acted on sufficiently long, which gives a very beautiful effect, considerably superior to that of platinum prints. The prints ought not to be washed out between toning and fixing."—*Invention.*

Photographing Stars in the Daytime.—In the *Astronomical Journal* for September 16, 1889, Prof. Holden gave an elementary theory of the subject of photographing stars projected against a bright background. He showed that, if the intrinsic brilliancy of a star be ten times as great as its background, the photographic image in the Lick telescope was 4,124 times brighter than that of the sky. It was also proved that small photographic contrasts of this charcter could be increased with a given telescope by simply cutting down the aperture. Recently, Prof. Holden writes (*Astr. Journ.*, September 19, 1890), "The question has been examined experimentally by Mr. W. W. Campell and myself, using the great telescope (focus, 570 inches, and apertures of 33, 15, 8, and 4 inches). Photographs of Venus, Mercury, the moon, and of Alpha Lyræ have been taken in broad daylight (2 to 5 p.m.) with the apertures named, with a constant exposure of 0·13s., and on Seed 26 plates. In general, the smallest apertures used have given the darkest images, as demanded by the theory.

NOTES FROM INDIA.

BY COLONEL J. WATERHOUSE, B.SC., ASSISTANT SURVEYOR-GENERAL OF INDIA.

New Gelatino-Chloride of Silver Paper for Printing-Out.—Trials lately made with the new "Delta" paper manufactured by Romain Talbot, in Berlin, would seem to show that the death-knell of silver printing has by no means sounded yet, and that, though long threatened with extinction, the old process may well take a new lease of life.

The paper is prepared with a gelatino-chloride emulsion, like Liesegang's "Aristo." and the Obernetter printing-out papers, and has a thick, glossy surface of gelatine. It is exposed to light under the negative, just in the same way as the ordinary albumenised paper; the exposure is, however, less. As the picture is printed out, all the ordinary silver printing dodges of vignetting and shading can be carried out on the prints with the same ease and certainty as with ordinary silver prints. This, in itself, is a great advantage over the developing and other processes, in which the image is invisible, or only faint.

After exposure, the prints can be toned at once in a gold toning bath containing sulphocyanide of ammonium and some alum, but it seems an advantage in this country at this time of year to soak the prints for a few minutes in a bath of chrome alum at one or two per cent., and then, after a short washing in water, to tone them. They tone very quickly and readily, and are then washed and fixed as usual. After fixing, a hardening bath of alum is desirable. The coating of gelatine is fairly thick, consequently the prints are very much more delicate, and require more careful treatment throughout than ordinary albumenised paper prints; and there is a great tendency for the film to break away from the paper round the edges. The prints ought, as far as possible, to be kept apart in all the operations, and washed, after fixing, in an apparatus in which each print may hang vertically by itself in the washing water.

The finished prints are certainly the perfection of silver printing in their fine, rich tones and the delicate transparency and detail of the shadows. Full justice seems to be done to all parts of the negative. All kinds of negatives have been printed from, and the best possible results seem to be obtained, even from hopeless-looking ones; certainly better than can be obtained from the ordinary ready-sensitised papers usually obtainable in this country, or imported. The prints are more glossy than is, perhaps, altogether desirable, especially for those who detest a "vulgar glaze," but a matt surface can be given to them by drying them on a piece of finely-ground glass, or a celluloid film (?) previously greased to prevent their adherence.

The keeping qualities of the paper have not been tested. It came out by post in very good condition, but after a few weeks it showed a tendency to discolour slightly, and was used up. It is said to keep good from six to nine months, but in this damp climate it would require to be carefully kept dry in a calcium box, or by being well wrapped up in paraffined paper, especially as it appears to have a tendency to attract moisture. It is much more expensive than ordinary ready-sensitised albumenised paper, but probably contains more silver. However, if—as seems likely—the prints are more permanent than albumen prints, while certainly better results can be more easily obtained, the extra expense will not be of much

consequence. It is only very little more than for bromide prints by development.

Similar papers were recommended by Captain Abney, and the process of preparing and using gelatino-chloride emulsions for printing-out on glass and paper was very fully described by Messrs. Ashman and Offord some four or five years ago, but English manufactnrers do not appear to have taken up the preparation of these papers, and have left it in the hands of German makers.

Acid Fixing Bath.—The acid fixing bath recommended for nse with the eikonogen developer seems to be an improvement over some of the others that have been bronght forward. It keeps clear, and retains its fixing powers for a considerable time. It is composed as follows:—

Hyposulphite of soda	...	...	200 grammes
Sulphite of soda	...	...	50 ,,
Water	...	...	... 1,000 c.c.

when dissolved, add slowly—

Sulphuric acid	...	...	6 c.c.

But it seems to work better with more hyposulphite.

Reversed Positives with Thio-Carbamides.—During the past month farther experience has been gained in obtaining reversed positives with thio-carbamides in the developer, and some improvements have been effected, though the method seems too uncertain to be considered thoroughly practical. As the phenyl-thio-carbamide appeared to be more regular in its working than the others, the experiments have been almost entirely with it.

It has been found that at present temperatures (about 80° F.) 1,000 parts of distilled water take up about 1 part of phenyl-thio-carbamide. Also that it is advantageous to nse a smaller qnantity of this thio-carbamide in the developer than was first recommended, and that from 12 to 15 parts of the saturated solution as above in 100 parts of the eikonogen developer are quite sufficient. By using more the ground becomes darkened, and it is difficult to get clear lights.

The preliminary oxidising bath of dilute nitric acid at five per cent. is decidedly useful in copying work, and it is also advisable to use the bromide of copper bath at two to three per cent. before fixing. It may be noted that a preliminary treatment with the bromide of copper solution before development destroys the image. For landscape and half-tone work the nitric acid treatment is also an improvement, but the best working conditions have not yet been ascertained.

Bichromate of potash does not seem to answer so well as a preliminary oxidiser with phenyl-thio-carbamide as nitric acid, and does not give good results when added to the developer. It seems to work better with thio-sinamine.

Ferridcyanide of potassium, added to the developer in the proportion of 2 to 4 parts of a ten per cent. solution to 100 parts of eikonogen developer, containing the usnal proportion of phenyl-thio-carbamide, acted as a strong restrainer, and thongh it gave complete reversals, it did not seem to exert the clearing and intensifying action of the nitric acid. The images obtained with it have been weak and of a chocolate-brown colour. Further trials are, however, requisite.

Thio-sinamine and thio-carbamide in the eikonogen and hydroquinone developers, with preliminary treatment with nitric acid or bichromate of potash, have not given good results for copying line work, and phenyl-thio-carbamide seems best suited for this purpose.

With the hydroxylamine developer neither phenyl-thio-carbamide, thio-sinamine, or thio-carbamide show any reversal, but it may be noted that thio-sinamine seemed to stop the evolution of gas in the film, but the image was not very strong. Glucose also is useful in this respect; it acts as a restrainer, and gives a very fine deposit of good colour, but rather wanting in density. Manna also reduces the blistering, and does not restrain development so much as glucose, giving a dense image.

Under favourable circumstances the process with phenyl-thio-carbamide seems likely to be usefnl for line-work. In half-tone work, either copying or landscape, it is much more uncertain, and a great deal more work will be necessary to ascertain the best working conditions for ensnring certainty, if, indeed, it is possible to do so.

At present these conditions seem to be to use as little as possible of the reversing agent with the minimum of exposure necessary; not to use more added bromide than is necessary, a fairly strong eikonogen developer, and a preliminary treatment with a suitable oxidising agent; the proper proportion of sulphite has yet to be determined.

The weather during the month has been hotter and damper than before, and very much against work with dry plates, and, under present circumstances, it is difficult to get definite results. Only one brand of plates will stand the treatment with acids.

Reversing Action of Sodium Thio-sulphate in the Ferrous Oxalate Developer.—In my paper last month, the reversing action of hyposulphite of soda, when added to excess to the ferrous oxalate developer, noticed by Prof. Eder, was alluded to as the solitary instance of a substance added to the developer causing reversal. It was forgotten at the time, however, that some very clearly reversed positive images had been obtained last year on "Ilford" plates developed with a ferrous oxalate developer containing a fairly large proportion of hyposnlphite, after an exposure of thirty minntes on a view. On again repeating the experiment, similar results were obtained, but, on fnrther investigation, it has been found that the thio-sulphate plays no active part in the reversals, and, indeed, they are, in some respects, better without it, the fixing salt having a weakening action on the image. With "Ilford" plates exposed on a view about thirty minutes, sufficient to show a faint but qnite visible image, ferrons oxalate has given very perfect reversals, in some respects even better than those obtained with the thio-carbamides. Though not so bright, and of a blacker and less agreeable colour, there is more perfect gradation, the lights are generally clearer, and there is no solarisation about the skyline. A lightning conductor comes out sharp and clearly reversed against the sky, which has seldom been the case with the thio-carbamide reversals, unless the plates have been much under-exposed.

Similar reversals have been obtained with pyrogallol and eikonogen developers with about the same exposure, but not so clear in the lights.

It may be noted that, on developing one of these over-exposed plates with an eikonogen developer coutaining phenyl-thio-carbamide, the same reversal took place, and the further action of the thio-carbamide did not change it into a negative, thongh it fogged over. The long exposures necessary for obtaining perfect reversals in this way render the method almost useless for practical purposes, unless means can be found for accelerating the action. If reversals obtained with short exposures by means of the thio-carbamides were as perfect as those produced by long exposure, the problem would be almost solved.

LIGHTING.*

BY E. P. KING.

This paper is not written with the idea of giving any of the older heads anything new, but as a starter, in hopes that we may hear from some of them, and get more practical ideas than I am able to give.

I was somewhat surprised at receiving a request from our worthy president, calling for a paper on lighting, and, no doubt, you will all be glad to learn it was to be a short one.

The question is, "What is lighting, and is it best to know it on *scientific principles*, or to train the eye to know *when* the lighting is correct?"

Did you ever stop to think, while lighting a subject, why you move the curtain a trifle higher, or the side curtain a trifle lower, and see how long it would take to give a more satisfactory answer than that it did not suit your eye as it was, but by that movement it was satisfied?

Now, how can the eyes be trained? Of course, we must know the principles of light and shade first. These I do not propose to speak on, as it would take too much time, there being so many books published on this subject; so I will only give my own experience in study, and there may be a good point in it all somewhere, I hope.

After working at the business some time, I found the only practical way to study lighting was when someone was paying for what they thought a graduate's work (not a student's), and while making my sitting, my thoughts were so busy on all details that I had no chance to give my eyes the necessary training, so I made and placed at a window a light about three feet long, in the same proportion to the one I was then working with, and used as my subjects small dolls; and at my leisure, with my little dumb subjects, experimented with light, and in that way spent many a happy and profitable hour, and became quite in love with my models, because they never dictated to me, and not one of them ever said they would as soon have a tooth pulled as sit for a picture.

On the floor of my model light I made a large circle, and found by placing my subjects on and moving them around the circle I had produced almost every light that is needed in portrait work. When tired of portrait work, I then tried fancy lighting and groups, trying to reproduce a light I saw in "so-and-so's" photo., or in a painting, or a lighting in a street car.

Did any of you ever notice the number of different lightings you may see in a car? There are more chances to study good lightings there than many are aware of.

If I had an appointment with a subject where there was a chance to make something nice, I would get my little models, and have a practice before the subject came, thereby ascertaining exactly what I wanted, and where to place my subject.

After learning by my model light, I always seemed to have an imaginary circle in my operating room, and knew where to place a subject for any light I might want.

There is fully as much in lighting a face as in expression. If you take a subject with a drooping of the mouth on one side, or strong lines about the nose and mouth, and make what some call a "shadow lighting"—why they call it so I have never been able to find out—you will make the lines very prominent, causing more work in retouching, and not as satisfactory a finished print as if a plain, soft lighting had been used.

In lighting white drapery, I advocate posing the figure well under the light, and, with the use of the head screen and reflector, soften the lights on the face *only*, leaving the drapery strong and bold. Some operators object to the use of the screen or reflector. I have worked under lights where I found it unnecessary to use either, the light being ground glass, and always soft. I have also worked under a clear glass light and used no screen, because my customers did not see the difference between a black-and-white picture and one full of gradation, and I did not know the difference. So we were both happy, and our eyes satisfied, but, as my eyes received more training, I found I had to improve my work or close my eyes.

I once worked for a gentleman who posed a subject in a white dress about four feet back of the open light, and got a pretty light on the face by turning it from the light. But the drapery! Well, when I had developed the plate it was condemned, because I had not made good in the dark room what he had ruined under the light.

Now, my brothers in the profession, if you find anything in my paper that is weak, and needs intensifying, do your intensifying.

* Read at the Washington Convention.

Lantern Slides.—Lantern slides will, 'ere long, be in favour again, as the dull weather approaches, and it may be well to point out a few facts that are too often overlooked in connection with the production of this class of pictures. A perfect slide has been defined as having its highest lights clear, its secondary lights with a full range of gradation, and its shadows transparent and full of details without opacity anywhere. In proportion as a slide fails in any one of these points, it departs from the standard of excellence. It will be evident that there are two great factors which prevent so many slides from reaching the standard. They are, first, the deficiencies of negatives worked from, and second, the absence—in too many cases—of reasonable discretion in the pains taken to correct, as far as may be, those deficiencies. Whatever care may have been used in obtaining the negative, it is, in the great proportion of cases, impossible *to be certain* that the requisite qualities will be obtained. We do not mean to insinuate that a special class of negative is wanted to produce a good slide, for we hold that a negative possessing the characteristics requisite to give a good print by almost any process will produce an equally good slide with the same amount of care. We only want to lay stress on the fact that negatives have an unfortunate habit of being far short of perfection, but that being so, we want to point out that it is too often forgotten that the defects in negatives can, in the making of slides, be to a very great extent corrected and modified by exposure or development. Having a negative with the shadows thin and high-lights dense, we know, or ought to know, that we must over-expose somewhat, and use a developer rather weak, with rather less than the normal quantity of bromide (restrainer). We write, naturally, of alpha lantern plates, with which we are best acquainted. On the other hand, a weak negative will want less exposure, and more bromide, with the normal alkali. Such a negative will also be best printed from with a less intense light than usual; or, in other words, the printing-frame should be held a little further away from source of light. *Au contraire*, a hard negative, as first mentioned, should be placed nearer the light. Of course, we are presuming that both class of negatives we mention are full of detail, but have either too great or too little contrast. Negatives which have either of these defects, and in addition have not detail, can never be made to give the requisite gradation by any modification, and it is useless to waste time trying to make a good slide from that which is a bad negative.—*Scraps.*

Notes.

Once we published, as a supplement to this journal, a photograph by Colonel Noverre reproduced by the collotype process upon exceedingly rough paper, a paper rougher than ever issued—in this country, at least—in connection with a newspaper supplement by that process. The growing public taste for prints upon rough paper was so met, not without difficulty. Such prints can only be obtained in collotype by machining with extra heavy pressure, combined with slow speed; other unusual conditions also require attention. With this rough-paper collotype printing, the plates require frequent renewal. In a recent supplement of a picture by Mr. Cembrano, several practical difficulties cropped up, so that the prints turned out were of unequal quality, and some of them did not give an idea of the beauty of the original negative, the chief feature of which was a delicate play of light and shade in the sky and water. A trace too much or too little pressure, the amount of absorption of the ink by the paper, and variations in other delicate conditions, perceptibly affected the result. It was one of the most difficult subjects for reproduction on rough paper that the printers ever took in hand. In fact, collotype printing on excessively rough paper is, at present, in this country, as much in the experimental as it is in the practical stage for certain classes of subjects.

Mr. Cecil Carns-Wilson writes to *Nature* that he has invented a luminous crayon for drawing on the blackboard while other illustrations of the remarks of the lecturer are being given by means of the magic lantern. Why should not the lecturer also have a bottle of phosphoric oil, and rub some of it over his face, that those present may see the play of his features? The sight of such play of features being a means of giving emphasis to remarks, and imprinting them more firmly on the memory, is a means of enforcing attention which should not be overlooked. The lecturer is encouraged when he knows that the listeners are interested, so their features might be rubbed with phosphoric oil likewise, and the whole proceedings could close with the burning of coloured fires by way of applause. Could not the light of the glow-worm be utilised? Mr. Gerald Massey once told us that he wrote one of his poems by means of the light emitted by a glow-worm crawling over the page. South American fireflies are giddy, frivolous young things, not sedate enough for utilisation by the scientific lecturer.

On Thursday last, passing through the City, and during one of those temporary blocks in Cheapside which give omnibus conductors and cabbies opportunities for badinage and repartee of forcible, if not always polite, tendency, we heard one of these men ask another whether the fire at Christs' 'Orspital was still alight. The answer came quickly, "No, its hout, and none o' the blue-coat boys is roasted!" The incident passed from our memory until the next morning we took up our copy of the *Daily Graphic*, and then learnt that a fire had actually occurred at the famous school. But what interested us more than the fire was the sketch of the event which appeared in the paper, and which was taken, we read, from an excellent instantaneous photograph by Mr. W. S. Bradshaw, of the London School of Photography. Bravo! Mr. Bradshaw, and bravo! *Daily Graphic* too—for pictures from photographs "up to date" like this are indeed valuable.

In an article entitled "Shop Window Celebrities," which last week appeared in the *Evening News*, it is stated that the sale of photographs of prominent personages is on the decline, and this is attributed to the large number of engravings and sketch portraits which have appeared in the newspaper press since the discovery of the photo-etching process. We also learn some interesting particulars with regard to the selling value of the portraits of different celebrities. The Archbishop of Canterbury and the Bishop of London head the list among the clergy; Tennyson takes the lead among literary men, and Tyndall has first place in science. The two political leaders, Gladstone and Salisbury, naturally come first among politicians, but Balfour and Churchill run very closely at their heels. Lastly come the prize-fighters, among whom, we learn, that the veteran Jem Mace holds his own very well against such new comers as Slavin, Jackson, and Sullivan. It would be interesting to know the market value of a Bishop's negative compared with that of a pugilist, but on this point the deponent is silent.

Before the snow makes its appearance, let us say one word about the opportunities which the present fine weather affords for autumnal landscape photography. Mr. Millais has shown us the poetry and beauty to be coaxed out of simple materials even in "chill October," and although the photographer does not work with colours, there are many scenes of a similar nature which lend themselves remarkably well to studies in monochrome. The lace-work formed by the shrivelled leaves which yet remain upon the branches of the trees has a beauty of its own, and this effect can often form the principal feature of an autumn photograph. The blue mist which hangs about the country at this time of year at one time presented a difficulty to the photographer, but it is obviated by the use of a yellow screen and a colour-sensitive plate.

Judges and magistrates are very chary of admitting photographs as legal evidence. No doubt there is some justification in regard to the photograph of a person, as cases of mistaken identity are not uncommon in the flesh, and might well occur in the photograph; but it is difficult to see where the objection comes in with regard to the photograph of a scene in the street. The Tipperary magistrates, however, hold this view, and so the photographs taken by Mr. P. O'Brien, M.P., of the struggle in front of the Court-House were rejected. This is a pity, as it is a check upon enterprise

in this direction. Supposing an amateur with his detective camera photographs the picking of a pocket by a thief, we suppose the thief would have the right to object to the production of such a picture, and, possibly, the objection would be upheld. In America, as in England, photographs are rejected as proofs of identity. The latest example occurred in a case before Judge Cullen, of Brooklyn, who said, when a photograph of the defendant in a divorce case was produced, that it would be necessary for the witness to personally identify the person in his presence.

The International Literary and Artistic Congress, which concluded its sittings on Friday last, had a good deal of novelty about it. One especial feature of singularity was that, although it was held in the metropolis, at the residence and under the immediate patronage of the Lord Mayor, and although, so far as photography is concerned, the subject discussed was of pressing importance, yet not a single English photographer of eminence, so far as we have been able to gather, was present. It seems difficult to understand why the Congress was held at all, and certainly why it was called "International," but probably we shall learn the reason in time. The discussion in connection with the photographic section was commenced on Wednesday, when the old vexed question as to whether a photograph is a work of art or not was entered upon. The main point was, should a photograph be protected under a special law, or under that of art and literature? and out of this point, of course, arose the discussion we have mentioned.

The general opinion was that a photograph was an artistic production, and should as such be protected; but one speaker argued against this view. While he allowed that the rights of photographers should be rigorously protected, he was not quite so sure about the artistic worth of photography. "Would you," said he, "consider those wretched little pictures of sixpence each, sold in the Boulevards, works of art?" He was inclined to think the photographers should claim a copyright under the heading of an "industry." The succeeding speaker did not mince the matter when he gently insinuated that the gentleman who had argued against art and photography did not understand what he was talking about. This speaker contended very fairly that a photograph should be protected in company with lithographs, engravings, and etchings. A photograph, he said, could be lithographed, and the lithograph could be protected; why, then, should the photograph itself not have this right? The discussion was adjourned till Friday, when the conclusion of the report of Dr. Vannois was adopted, with amendments suggested by the President (M. Bulloz) and M. Davanne. The effect will be to give to photographs the status of works of the graphic artist, the Congress protesting against any attempt that may be made by nations who have not accepted the Convention of Berne to introduce into new legislation any provisions of a retrograde character.

The modern photographer and his *fidus achates*—the retoucher—have introduced a new embarrassment into society. The embarrassment arises when a lady shows a portrait of herself very much beautified to a friend, and the latter exclaims, in natural surprise, "What, that is not you, surely!" Directly the words are uttered, the unfortunate friend feels guilty of having perpetrated a thing which one would rather not have said. What *is* one to do when asked to give an opinion on a photograph which is grossly unlike the original, and which the original is, secretly, very proud of? Is good taste to be sacrificed to truth, or is truth to be kept in the background? Perhaps the safest plan is the middle course, adopted by Sir Joshua Reynolds whenever an effort of juvenile genius was shown to him by parents. "Yes," he would say, "it is very pretty." This is the criticism which exactly fits a touched-up photograph, and we think anyone would be perfectly safe in using the formula.

Special privileges are certainly accorded to the amateur photographer. The professional man may not carry on his business in the parks under the jurisdiction of the County Council, but the amateur may easily get permission to work there. Cricket matches are constantly being interrupted so that the teams may be photographed, and now comes the story that the commanders of two opposing armies kindly stopped the progress of a battle for a brief space, so that a couple of English tourists might use their cameras. The battle took place during the revolution at Buenos Ayres. The two armies were drawn up in a public place, and were firing briskly at each other, when out came an English lady and gentleman armed with camp-stools, opera-glasses, and a detective camera. They seated themselves between the opposing forces, and, with charming impartiality, proceeded to photograph both, while the leaders, with true politeness, ordered the troops to cease firing while the operation was performed. If this story be true, it opens up quite a new era for the "special correspondent." He must never go to the scene of battle without a camera, when every facility will be afforded him. If we recollect rightly, Mr. W. S. Bird, in his genial speech at the last dinner of the Photographic Society, alluded playfully to the possibility of something of this kind happening in the future. And now, judging from what took place at Buenos Ayres, the prediction has been fulfilled.

A curious application of the electric light and photography is recorded. A West-end wall-paper manufacturer, having noticed the curious effect of the dark, clear-cut shadows caused by the play of the electric light among the foliage of trees, has conceived the idea of applying these forms, so clearly defined, to wall-paper patterns. He has been for some time making, by means of photography, a series of records of these beautiful effects, which he intends to use in connection with his business. Some of the designs which have already been made are, it is said, of exceptional merit.

MY EXPERIENCE WITH HYDROQUINONE.

BY J. C. HEGARTY.

My attention was first called to hydroquinone about the time of its introduction by reading several articles setting forth its merits as a developer in the various photographic journals. During the summer of 1888 I saw some plates developed with this new reducer by a photographer in Philadelphia I was pleased with its action, and secured a supply for the purpose of experiment. After my return home I gave the hydroquinone developer a trial, and have been using it in my photographic work ever since. I have found it superior to pyro in every way except in rapidity, and this objection of slowness in working can be removed by using caustic potash as an accelerator. But hydroquinone does not owe its claim to superiority to rapidity of working, but to other points—the fine negatives it produces, the beautiful detail, even in the deep shadows, and entire absence of stain.

Another advantage which should be noted is the great latitude of exposure, and the fact that every effect of exposure appears to be grasped by it. I have exposed plates on scenes with heavy foliage, dimly lighted, and views in shady dells, giving a very liberal exposure, and developed with hydroquinone, getting full detail in the shadows and fine half-tones, without the high lights being opaque or too thin. Had the same plate been developed with pyro it would have resulted in a flat negative, with the high lights very much over-timed. The absence of fog or stain is one of its chief merits. The development of a plate can be prolonged to almost any extent without danger of fog, and the shadows always remain clear and transparent. Its pleasant and agreeable method of working, and the sureness of results with hydroquinone developer, make developing a pleasure, and relieve the amateur of many disappointments.

Some operators are not successful in working hydroquinone; but doubtless most of the complaints are from persons who do not properly use it, or work with a solution not properly prepared. They may have under-exposed their plates, or lacked the patience necessary to develop a short exposure.

I tried several formulæ, most of which were good, and, being an advocate of simple formulæ, I chose the following, which has proved very satisfactory. The ease of working, and certainty of results with it, have led me to recommend it to others.

A.—Sulphite of soda crystals...	...	...	2	ounces
Ice or distilled water ...	...	...	16	,,

Dissolve and filter; then add—

Hydroquinone ...	...	...	120	grains
B.—Carbonate of potash ...	...	...	1½	ounces
Ice or distilled water ...	...	...	16	,,

Normal developer: One ounce of A, one ounce of B, and one ounce of water. If pure water be used, the amount of sulphite used in A solution is sufficient to ensure its keeping; if more should be added, or any acid used, it retards its action. I find no difficulty in keeping it in good order for weeks. Nothing is added to the carbonate of potash solution.

Now as to the method of developing. First notice the temperature of your dark room, which should be 70 or 75 degrees Fahrenheit. I find that a difference in the temperature makes a marked difference in the time it takes to develop.

If I have a batch of 6½ by 8½ plates to develop which I think have had about the correct exposure, I mix five ounces of solution with a little less than the normal quantity of alkali, and, if my note-book leads me to believe that any are over-exposed, I reserve them for the last, using the weakened developer on them. Put a plate in the tray and flow with the solution: if it has been correctly exposed, and the solution is freshly mixed, traces of the image will begin to appear in one and one-half or two minutes, and grow steadily with good contrasts and infinite detail. Do not hurry the development by adding alkali, for the finest tone graduations are built up slowly. The development is completed when the shadows show no white on the surface. The high lights usually show on the back of the plate. Wash and fix as usual, leaving the negative in the hypo a few minutes after it is clear to insure thorough fixing. You will then have a crisp, brilliant negative, full of detail in the shadows, and of fine printing quality, the film being pure in colour through all the range from black to transparency.

If a plate is known to have been over-exposed, or if you are doubtful as to the exposure, the solution should be prepared with not quite the normal amount of A solution and about one-fourth of potash solution. The image will then appear very slowly, giving the person time to modify the developer to suit the exposure, cautiously adding alkali or hydroquinone as the plate requires. It should then build up in fine form. Some may become impatient at the time required; but the amateur who works for results will not object to the time, and who would not rather have one good negative than a dozen poor or indifferent ones?

In regard to exposure, I am apt to over-expose a trifle and develop slowly, and by that means secure brilliant negatives with plenty of detail in the shadows.

I will not say that hydroquinone will take the place of all other developers, for during the great advancements in photography other reducers may be discovered, and the possibilities of eikonogen are not yet fully known: but I do think that a developer superior to hydroquinone would be a perfect universal developer, and I venture to say that, if hydroquinone development be once mastered, but few will return to pyro.—*The American Amateur Photographer.*

A general meeting of the directors of the eighteen chief observatories in the world will meet in Paris on the 30th of March next, to make their final arrangements before commencing the great photographic atlas of the heavens, divided into numerous zones. The atlas will consist of from 1,800 to 2,000 leaves, representing 12,080 large squares, comprehending the superficies of the celestial sphere.

A Photographic Amateur.—A phase of the matter of asking questions is that of enquirers who, knowing nothing of photography, will not even take the trouble to read the directions given with any articles they are using. For example, a gentleman wrote to us a short time ago saying he wanted to know the reason for using of the alum bath with Ilford plates. This desire to know the why and the wherefore is most admirable in its way, but, as we pointed out to him, if he had read the instruction issued with each box of plates with ordinary attention, he would have found this phrase, "acid added to the alum bath entirely destroys its property of hardening the film." This same person owned that he did not know of the existence of any photographic publication except *Scraps*, and naturally applied to us. Therefore we forgave him, and wrote him a long letter of instructions, and recommended him to buy a text-book and study it carefully.—*Scraps.*

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

All photo-chemical investigations which have hitherto been made have proved that the amount of chemical action is proportional to the "exposure"—*i.e.*, the product of intensity of light and time. The sensitive film of the photographic plate forms no exception to this general law, and we take it as a fundamental truth that the amount of action upon the plate is, at any moment of the exposure, proportional to the energy which the plate receives at that moment. During the first period, when the surface—or chiefly the surface—of the film is acted upon, the results of the investigations have shown this to be true accurately; but when the action of the light upon particles of bromide of silver below the surface has to be considered, the question arises, how much of the light which impinges on the surface really reaches those particles?

Of the rays of light which impinge upon the surface of the sensitive plate, some are reflected and some pass right through the plate. If one sensitive plate be exposed to light behind another, it will be found that it also is affected.

The energy of the reflected and transmitted light cannot, obviously, play any part in the molecular work to be done in the film. It is useless photographically.

The light absorbed in the film is the only light which contributes towards the formation of the "latent image," but not even the whole of the light which is absorbed does useful work. It can be proved experimentally that a plate which has received such an exposure as to yield maximum density on development, absorbs exactly as much light as a plate which has not been exposed at all, yet the light absorbed by a plate already so exposed obviously contributes nothing towards increase of density.

From this it is clear that the light absorbed by a particle of silver bromide which has already received sufficient energy to bring it into that condition in which it is capable of development, is useless.

It will, therefore, be evident that, of the light impinging upon the plate, there is only one portion useful, viz., that which is absorbed by unaltered silver bromide, the light reflected, the light transmitted, and the light absorbed by particles of silver bromide already changed, being altogether useless.

The amount of work done at any moment of the exposure is, therefore, proportional to the amount of energy received by the unaltered silver bromide only.

It is very easy to state this proposition mathematically, and thus find the law which connects the densities with the exposures.

If the intensity of the light—with respect to chemically active rays—is I, and the fraction of the light reflected from the surface of the film is a, then the amount $(1-a)$ I enters the film. If the film contains, at the moment we are considering, x particles of silver bromide per unit area, which are already changed, then the transparency of the plate with respect to the changed particles is E^{-kx}, *i.e.*, this is the amount of light which passes the particles already changed. If from this amount we deduct the amount of light which passes *all* the particles of silver, changed or unchanged, the difference represents the amount of light absorbed by the silver bromide not yet affected. Now, the light which passes all the particles of silver, if there are a of them per unit area, will be measured by the transparency of the plate, viz., E^{-ka}. Deducting this from E^{-kx}, and multiplying the difference with the total amount of light entering the film, will give the mathematical expression for the amount of light which, at the moment we are considering, can do useful work; this amount is $(1-a)$ I $(E^{-kx} - E^{-ka})$. If this expression is multiplied by the short time of exposure dt, it will represent the amount of useful energy conveyed to the plate during that time.

Suppose it requires an amount of energy e to change one particle of silver bromide into the condition capable of development, then the number of particles dx so changed during the time dt will be

$$(1.)\quad dx = \frac{T}{e}\ (1-a)\ [E^{-kx} - E^{-ka}]\ dt.$$

This is the complete mathematical expression of the idea that it is only that portion of the light which is absorbed by unchanged silver bromide which contributes to the growth of density.

By integration of equation (1), and by substitution of the symbol 0 for E^{+ka}, we find that the density of the "latent image" (before development) is

$$D = \log_{\epsilon} [0 - (0 - 1)\ \beta^{k\,(1-a)\frac{It}{e}}]$$

where β is a fraction, the hyperbolic logarithm of which is $-\frac{1}{0}$, 0 is simply the opacity of the plate to the chemically active rays before exposure.

In this derivation of the connection between the density D and the exposure It, two assumptions have been silently made which need explanation. The coefficient of absorption, k, has been assumed to have the same value both for the altered and the unaltered silver bromide. We have, however, experimentally ascertained that this is a fact. It can be easily proved photographically. If, behind a plate, one portion of which has been already exposed so as to yield maximum density, the other portion having received no exposure at all, a very sensitive plate is placed, and if now a suitable exposure be given, it will, on development, be found that the shielded plate has uniform density all over. This proves that k is the same as regards blue light both for the altered and for the unaltered silver bromide.

The second assumption is that the sensitive film obeys the laws of absorption, as explained at the beginning of this paper. It would prolong this paper very much if we had to furnish here the proof that, as far as the chemically active rays are concerned, and as far as the light *not reflected* is concerned, the law of absorption does hold good. Suffice it to state that, to the more refraugible portion of the spectrum, the sensitive film is as black as Indian ink is to white light.

To recur to our formula, it requires still more alteration to complete it. The density as given by the formula is the maximum density, and expressed as regards the behaviour of white altered silver bromide towards the blue rays of the spectrum. As we know already, we can develop of that maximum density as much as we please, and the change from white to black during development makes the density more or less equal for all rays of the spectrum. We therefore simply multiply the equation by a constant to express this change, and we call this the development constant. The formula then stands—

$$D = \gamma \log_{\epsilon} [0 - (0 - 1)\ \beta^{k\,(1-a)\ \frac{It}{e}}]$$

k, a, and e represent physical and chemical properties of

* Continued from page 790.

the bromide or silver, which together constitute its sensitiveness to light. We combine them into one single symbol, and write $i = \frac{c}{k\,(1-\alpha)}$, so that we have finally—

$$(2.)\ D = \gamma \log_{\epsilon} [0 - (0-1)\,\beta^{\frac{It}{i}}].$$

This formula represents the density of development as a function of the opacity of the unexposed plate, of the exposure, and of the symbol i, which is a measure of the slowness of the silver bromide, and which symbol we shall call the "inertia" of the silver bromide.

To show the approximation of densities calculated by this formula to those obtained in experiments 21 and 22, we append here the calculated and the observed densities. For this purpose the plates used for experiments No. 21 and 22 were investigated for their opacity to the rays of the spectrum from F to H, and this opacity was found to be 332.

Experiment 21 compared with theory.

Exposure, C.M.S.	Density Found	Density Calculated.	Exposure, C.M.S.	Density Found.	Density Calculated.
0·625	·045	·035	80	1·010	·992
1·25	·055	·065	160	1·270	1·272
2·5	·085	·121	320	1·555	1·531
5	·175	·214	640	1·885	1·780
10	·250	·339	1,280	2·088	2·022
20	·460	·520	2,560	2·262	2·218
40	·755	·743	5,120	2·352	2·352

Experiment 22 compared with theory.

Exposure, C.M.S	Density Found.	Density Calculated.	Exposure, C.M.S.	Density Found.	Density Calculated.
1	·060	·092	128	1·875	1·800
2	·160	·172	256	2·290	2·165
4	·340	·302	512	2·535	2·518
8	·500	·482	1,024	2·985	2·860
16	·715	·735	2,048	3·115	3·138
32	·940	1·050	4,096	3·280	3·328
64	1·345	1·405	8,192	3·405	3·405

On examining the "calculated" series of results, it will be found that they have exactly the same characteristic properties as those we pointed out as appertaining to the three periods. For the short exposures the calculated densities are nearly proportional to the exposures, whilst from 16 C.M.S. to 1,200 C.M.S. the densities increase by nearly equal amounts for every successive double exposure, and differ very little from densities calculated by the simple formula—

$$D = \gamma\,[\log It - C].$$

In order that this may be very clearly seen, we append another table, comparing in column 1 the densities obtained by the correct formula (2), with densities in column 2 calculated by the approximate formula—

$$D = 1{\cdot}176\,[\log It - 0{\cdot}579].$$

Exposure, C.M.S.	(1.) Density by Correct Formula.	(2.) Density by Approximation.	Exposure, C.M.S.	(1.) Density by Correct Formula.	(2.) Density by Approximation.
16	·735	·735	256	2·165	2·151
32	1·050	1·089	512	2·518	2·505
64	1·405	1·443	1024	2·860	2·859
128	1·800	1·797	2048	3·138	3·213

We think it necessary to draw attention to this agreement, because the approximate formula is extremely easily applied, whilst the correct formula requires very tedious calculations, and we shall make a very important practical application of such calculations.

(To be continued.)

PHOTOGRAPHY IN GERMANY.

BY DR. H. W. VOGEL.

Restoring Exposed Plates — Warnerke's Luminous Table—Films in a Tropical Atmosphere—The Value of Decoudin's Photometer—New Magnesium Powder for Enlargements—Stereoscopic Effect in Lantern Pictures.

There are certain photographic tales which pass from mouth to mouth and find a good many believers, and to these belongs the assertion that we are able to restore an already exposed plate so that the image impression disappears completely from the sensitive film, by placing the plate in a weakly acidified bath and sending an electric current through the latter for a prolonged time.

The Paris *Figaro* mentions still another process by which one should likewise be able to restore an already exposed plate. This matter has, undoubtedly, its significance. It will happen to the best photographer, when he is in a great hurry, that he may get two pictures on the same plate, whereby the latter, of course, becomes useless. On the other hand, when travelling, two negatives are oftentimes made of the same subject on account of the uncertainty in the time of exposure, which changes according to the height of the sun or cloudiness. If the first of these plates is developed and proves to be good, the second is considered unnecessary and is laid aside; it becomes, therefore, a useless sacrifice. The process mentioned in *Figaro*, to treat plates of this kind so that the image impression disappears, the plate therefore being restored for a new view, consists in bathing the plate for two to three minutes in a three per cent. solution of bichromate of potassium, after which it is well washed and dried.

Dr. Riesenfeld has made a test of both manipulations. The electric current, in gradation from the bare immersion of an element to the full immersion of six large Bunsen cells at a duration of from two minutes to half an hour, gave completely negative results. Bichromate of potassium gave also no satisfactory results. In a few cases the picture disappeared completely; but as a general thing the picture would appear in the development, even if very faint. Additional bromide in the bichromate bath had no influence.

My views are that all experiments to restore a plate are not worth more than that to restore a cartridge which has been shot off once. The labour is more expensive than the value of the results.

Lately the usefulness of the Warnerke sensitometer has been more closely investigated. This little instrument is spread over the whole world, and I find the scale of the same to be very good. I only am not favourable to the luminous table, particularly because it emits blue light, and because its brightness is not constant; but to determine definitely its usefulness I handed the table to Professor Leonhard Weber, who is considered first authority with regard to photometry. He has made experiments with the luminous table, and in consequence thereof he declares that the table loses its brightness very quickly after exposure. In the critical half-minute during which the exposure takes place the brightness sinks on the average from 100 to 65. The absolute brightness is also strongly influenced by the manner in which the exposure takes place. The table can, therefore, not be considered as a normal light-source. A normal lamp of Hefner, filled with amyl-acetate, is much more suitable for this. According to the most exact

investigations, this is considered the best light-unit at present existing.

The film question is now discussed here pretty vigorously, particularly since film manufacture in Germany by Perutz in Munich. They are colour-sensitive. A holder has now been constructed which will hold twenty-four 6½ by 8½ films, making the long rolls superfluous. About the usefulness of this instrument I will report at some later time, after I have been able to give the same a thorough test.

The durability of films in a tropical climate was the subject of discussion here recently. To determine the same in the interest of a Brazilian expedition, a Stegemann holder, filled with a sample of two colour-sensitive Perutz films (with glass-backing), was put in the conservatory of the Imperial Technical High School at a temperature of 28° C. on the 28th June, and left there until the 12th of July, therefore eighteen days. After this time the slide moved less freely than ordinarily. The films appeared partly matt, but were just as smooth as before. Being put into the holder without any support, they stuck somewhat to the wood of the holder, but could easily be detached from the same. They were developed with hydroquinone, and gave faultless pictures without the least trace of a black edge. As a consequence of this successful test the expedition provided itself with films.

Dr. Michalke, one of the most eminent young professors of physics, has made some experiments lately about the usefulness of the Decoudin photometer. The following doubts have been raised against its reliability:—

1. The eye, dazzled by the daylight, cannot correctly estimate.

2. The graduation of the apparatus is incorrect.

3. The apparatus gives the optical, but not the actinic lightness.

Considering the first reproach, we can protect ourselves against this by prolonged practice, and locating the apparatus immediately after putting the ground glass in proper focus under the focussing cloth. The apparatus should be placed as close as possible to the ground glass.

The amateur can make the graduation himself. One exposes at a certain height of the sun (about forty-five degrees when the object and its shadow are of equal size) with a certain diaphragm upon a line drawing, newspaper, or something similar, and the position is marked at which the transparent points of the photometer just disappear. On the slide of the plate-holder marks are made at about a centimetre apart each, and after the plate-holder has been put in its proper place the slide is drawn at certain intervals, centimetre by centimetre, so that one obtains upon the plates stripes of different times of exposure. The latter is chosen so that the middle stripe will show the estimated time of exposure, and that the first stripe is surely under, and the latter surely over, exposed. If, for instance, 30 seconds are estimated, the different times of exposure taken should be 5, 8, 13, 20, 30, 45, 67, 100, and 150 seconds, so that each following time of exposure is fifty per cent. higher than the preceding one. The slide is hereby opened at 150—100=50 seconds, at further drawing out of the same, 100—67=33 seconds, &c. When developing, one stripe will give the correct time of exposure, which is marked in the location of the photometer previously marked. It is sufficient to put marks on the photometer for three to four different brightnesses. For the intermediate brightnesses the marks on the photometer can be determined by producing different brightnesses upon the ground glass by changing the diaphragm, the relation being inversely proportional to the diaphragm openings.

(To be continued.)

REPORT OF THE PROGRESS OF PHOTOGRAPHY DURING THE YEAR CLOSING AUGUST, 1890.*

BY W. H. H. CLARK.

Were I permitted in this report to a reminiscence of but ten years, and had before me an audience ignorant of what has been accomplished by the aid of our art during the interim, this report could be made to sparkle like the diamond in crowning the progress of photography; but, alas! I have but twelve short months from which to formulate this report, and an intelligent and progressive audience to sit in judgment.

Photography is ever progressive, and ever will be, and although that progress may be rapid, comparatively speaking, the world probably never will be so overwhelmingly astonished by any announcement of the progress of our art as it was when Daguerre's discovery was first made public. Now and again a slight ripple across the photographic horizon is occasioned by the announcement that photography in natural colours is an assured success.

Recently an Austrian, Herr Verescz, announced that he had made a decided advance towards the solution of photography in colours. His operations, however, are based upon the researches of Mr. Carey Lea, on the photo-compounds of silver salts. It remains to be seen whether any decided advance over the latter has really been made.

Pigment Printing in one or several colours has long been successfully accomplished, and I am reliably informed that Mr. H. H. Snelling, in his early days, was a practical experimentalist in this direction, and is to-day in possession of practical formulæ for producing the colours by pigment printing; but owing to reverses in fortune and long continued sickness, and now almost totally blind and broken down with age, he has been unable to successfully bring before the fraternity his invention. It will be remembered by the older members of this association that Mr. Snelling for a number of years successfully edited and published *Snelling's Photographic and Fine Art Journal*. If it would not be considered out of order in this report, I would suggest to the members present they should appoint a committee of as many or few as is deemed advisable to investigate the claims of Mr. Snelling, and, if found of sufficient value, to purchase the same in the name of the Photographers' Association of America, to be published for the benefit of all.

The invention of Frederick Eugene Ives, of Philadelphia, which was patented the 22nd of last month, is undoubtedly a step in advance in photographically rendering the colours, and, possibly, may prove a great one. The invention consists in a method of producing a set of three photographs of an object or landscape, which can be subsequently used for the production of a heliochromic picture. The Ives patent consists of an apparatus or camera whereby three negatives of the same subject can be taken simultaneously, the light passing at the same time through three different colour screens or media, a full description of which cannot be rendered in this report. While this invention of Mr. Ives may become of

* Read before the American Convention.

great value and use, it is hardly to be expected that it will be of general practical utility in the hands of every photographer.

Orthochromatic photography has not made the advance that was hoped for it, and no marked improvement has been accomplished since last year. Much, however, is hoped for in this direction.

Photography an Art.—Whether or not we can rightfully call photography an art, it is, nevertheless, the hand-maid of art, and, in the hands of an artist photographer, fine art pictures can be produced; but your committee cannot report the progress in this direction that some of us had hoped for. The insane practice of rate cutting has reduced many bright lights in the photographic world to nearly the level of a common "shyster," and, with prices insufficient for a decent living, the quality of the work delivered to their patrons is anything but promising. I have visited a good many of the first-class galleries of the land, and the work there seen palmed off on the public as first-class was really shocking. In a great measure photography is superseding drawing with the pencil, and artists are making more use of the camera as an aid in producing the outlines of their sketches and models.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

15,783. J. D. MUCKLOW, 260, Camden Road, London, "Cameras."—October 6th.

15,789. A. ROCHOLL, 11, Furnival Street, Holborn, London, "Photograph Holders."—October 6th.

15,839. A. J. BUNCHER, 6, Livery Street, Birmingham, "Detective Cameras."—October 7th.

15,842. R. H. L. TALCOTT, 40, Chancery Lane, London, "Mounting Photographs."—October 7th.

15,961. J. P. BAYLY, 18, Fulham Place, London, "Camera" (W. Tobias, United States).—October 8th.

16,038. G. DICKINSON, 144, Morley Avenue, Wood Green, London, "Photographic Shutters."—October 9th.

16,045. R. W. PAGE and M. JUSTIN, 116, Beckenham Road, Penge, "Producing Silhouette and other Photographs."—October 9th.

16,069. E. DENT, 9, Eastcheap, London, "Printing and Designing on Xylouite, Ivorine, and such like Material."—October 10th.

16,084. W. GRIFFITHS, King's Heath, "Cameras."—October 10th.

Specifications Published.

18,547. *November 20th*, 1889.—"A Photographic Developer." BENJAMIN JUMEAUX, at present of 11, Brighton Place, Stretford, Lancashire, Artist.

My invention relates to a new or improved compound for use in photography as a developer. This compound consists of eikonogen, chlorate of potash, and sulphite of soda, used in the form of a solution. These ingredients may be used in the following proportions, namely—

Eikonogen (powdered) ...	...	... 2 drachms
Chlorate of potash (powdered)...	...	1½ ,,
Sulphite of soda (powdered) ...	...	3 ounces

which are slightly damped and mixed together, and then dissolved in one pint of hot water.

The above proportions are those which I consider give the best results but they may be varied or modified, more or less, without departing from my invention. For example, the quantities of the chlorate of potash and the sulphite of soda might be either slightly diminished or increased with the same weight of eikonogen.

Other suitable salts of potash, such as a bromide, and other suitable salts of soda, such as a carbonate, might be employed in combination with corresponding proportions of the chlorate of potash and sulphite of soda and eikonogen as herein described. Glycerine also might be added to the solution if desired.

The chief advantages obtained by my new or improved compound are, that it is self-contained—that is to say, it requires no accelerator; it will develop well with negatives of all makes, opals, lantern slides, and bromide papers, and does not stain either the hands of the operator or the plate, except after repeated use, when it will slightly stain paper or opal.

What I claim is:—

1. The new or improved developer consisting of a solution containing eikonogen, chlorate of potash, and sulphite of soda substantially as herein set forth.

2. The new or improved developer, consisting of a solution containing eikonogen, and salts of potash, and soda as described.

Correspondence.

AN EXHIBITION IN NEW YORK OF MODERN PHOTO-MECHANICAL WORK.

Nothing in the wonderful history of photographic progress, which has been so strikingly rapid during the past few years, has been of greater importance than the development of what may be called, for want of a better term, the photo-mechanical processes, which are so largely superseding wood engraving, steel engraving, and other pictorial methods. This subject is of great interest to the whole public, but particularly to all persons in any way interested in the production or use of pictorial illustrations, such as artists, authors, publishers of books, magazines, and newspapers, printers and manufacturers whose products require illustration. For the past few years these processes have multiplied in number, have improved greatly in their results, and are every day assuming greater importance in both artistic and economical directions; yet it is a remarkable fact that in no exhibition have they been brought together for comparison and study.

During the week beginning November 3, 1890, the New York Camera Club will give an exhibition in its Rooms, 314, Fifth Avenue, of the work of the various establishments producing all classes of photogravure, photo-engraving, photo-lithographic, and other mechanical photographic illustrations.

Admission will be by cards of invitation, which will be sent as generally as possible to photographers, artists, authors, publishers, printers, manufacturers using illustrations, and in general to all persons likely to be interested in the subject.

A pamphlet will be distributed at the exhibition containing an essay giving a sketch, historical and descriptive, of the different methods. A space, probably a page, will be set apart for each exhibitor, in which, on his own responsibility, he will be allowed to describe or recommend his process in his own way. No charge will be made for such insertion, and the pamphlets will be distributed free. Exhibits suitably framed and of proper character, subject to the approval of the committee in charge of the exhibition, will be hung upon the walls. Other exhibits, whether in books, albums, or on cards, will be displayed upon tables for the examination of visitors. All frames must bear a neat label, which will be furnished by the Club, giving the name of the exhibitor, the process by which made, and the title or explanation of the pictures. All other exhibits must be properly marked for identification. There will be no charge whatever to exhibitors.

DAVID WILLIAMS, *President.*
H. T. DUFFIELD, *Secretary.*
New York Camera Club, 314, *Fifth Avenue.*

MR. LYDDELL SAWYER'S PICTURES AT THE CAMERA CLUB.

SIR,—I do not take any particular exception to your review in last week's NEWS of my pictures at present on view at the Camera Club; many of its statements are correct, and as to its peculiarities, they will perhaps be sufficiently understood

and qualified in the minds of your readers when you let me tell them that the paper is from the pen of a red-hot naturalist.

I should feel myself holding a very precarious position if I could not withstand such an onslaught from a "candid friend;" and in this light I should not reply so far as it touches my individual pictures, but I am reminded by it of a matter of more general principles, and which I wish to object to with all my might. It is that of the-perhaps unconsciously-ungenerous and oft-times false objections raised against all posed pictures by a certain class, more or less proportionate to their imaginary or real sympathy with the narrow "naturalistic" school.

Taking any picture where the figures or accessories are arranged to tell a story, express a sentiment, or indeed create any effect, and however successful and natural the result may be, it must not be allowed, because *photography* has produced it, and the same old inconsistent sing-song is chanted forth about artificiality, straining, untruth, and so forth. The critic may not know "B from a bull's foot" in matters artistic, still he feels quite safe to launch forth this tirade, however unjust, because he knows the picture is not natural, insomuch that it is arranged for, and not accidentally formed.

Presuming that it could be always uncertain which pictures were posed, and which were simply mechanically obtained (for this is the *real* distinction), I wonder how many of these ultra-æsthetical gentlemen would be able to dispense their subtle sentiments! I am afraid there would be a large addition to the ranks of the unemployed.

As an instance in point, I have been very much amused at the eulogies bestowed on my two pictures, "Waiting for the Boats" and "On their own Hooks," by these "purists." Both pictures having a large number of figures included in them, appear to suggest to the superficial eye that they might have been groups accidentally alighted upon and taken, although I should have thought it would take a very small combination of pictorial and photographic knowledge to recognise that there is about the same possibility of accidentally finding and taking a group posed on these lines as there is of getting the whole thirteen trumps in one hand of whist.

As a matter of fact, with both of these groups I started by selecting a perfectly clear piece of quay, brought every figure and accessory on to it, and posed each as I wanted. They are the most entirely built up and posed pictures of my collection, yet the "naturalists," who do not admit arranging and posing, have declared these two pictures to be "masterpieces!" I leave your readers to digest these facts for themselves.

The pictures of my own which I am *nearest* to being satisfied with are those most created and posed. Spite of the many faults which I am quite cognizant of their possessing, and the "naturalistic" objections to this class of picture, I can still feel with some *true* sentiment that what *is* good in them is more honestly my own. "'Tis better to have loved and lost than never to have loved at all," and on the same principle it is more worthy to struggle straight forward, with, doubtless, stumbling steps, into the rough-pathed realms of art, than-from perversity, or ignorance of the road, or any other cause, to go nervously around its borders, making water into wool, chaotic blurs where detail should exist, cornfields into conundrums, and generally torturing nature until she must in many cases cry out with pain at the unnaturalness of "naturalism."

Photographers of legitimate art convictions are sufficiently open in mind to concede that with certain stretching of the artist's licence some naturalistic productions are of pleasing effect. This amenability to conviction is evidenced by the judges at Pall Mall this year having medalled pictures of this description. In return it might not be too much to expect that naturalists should be sensible enough, if not possessing sufficient innate "clannishness," to avoid obscuring photography in the eyes of the outside press and public, and endeavouring to snuff out its all too feeble higher art light.

I must repeat that, apart from the inconsisteney of the objection, when viewed beside many of their own mechanical and unnatural operations, the "naturalists" yield to a greater amount of narrow-minded injustice than, I trust, they are fully cognizant of in peeping behind the scenes, and from this point of view declaring all posed studies unnatural, not because any artificiality is manifest in them, but it is enough that they have discovered the original *modus operandi*, and that the photographer has dared to show he had courage enough to clothe the picture with his own ideas, instead of being content with the comparatively insignificant proceeding of pilfering pictures of nature's sole production, and palming them off as his own.

Please remember that what I have here stated is again connected with general naturalistic principles, rather than directly replying to your review of my work and its writer individually. In one direction at least my remarks would not apply, inasmuch that, however limited and inconsistent I may consider the judgment of the writer in this direction, I know he has only expressed his honest opinions; and as regards my pictures, they have received so much more kindly recognition than they can ever deserve on every side, from naturalists included, that I feel I have been too much indulged, and it would be very churlish to resent the first bit of adverse criticism which appears, even if it is on the wrong lines.

And now I am finished. Your reviewer, or any one else, can throw brickbats at either my pictures or me, if they like—while expressing a desire that the former might preferably receive these favours if their bestowal is absolutely necessary. I shall yet either way not trot out again for some time. We—again my pictures and I—have been too much in evidence lately, so I shall, with necessary modifications, follow the example of the young lady mentioned by Shakespeare, and "let concealment, like a worm i' the bud," have a meal or two off whichever cheek nearest approaches the apparently necessary damask tint.

By-the-way, I have another "candid friend," who suggests that if a real genuine damask colour is a necessity to suit concealment's digestion, he or she—as the case may be—is likely to preferably settle and grow fat on my ornamental proboscis. That's the worst of candid friends.

Newcastle-on-Tyne, October 13th. Lyddell Sawyer.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

Sir,—It has been pointed out that a medal has been awarded in error to photograph No. 600, in the Exhibition of this Society: "An Invitation to Supper," by Mr. Van der Weyde.

It was not noticed at first that this picture had already been publicly exhibited within the London Postal district, and should, therefore, have been disqualified.

The medal has been withdrawn.

It is greatly regretted that the mistake occurred. The exhibitor, through some misunderstanding, was led to suppose that the rules of the Exhibition did not exclude the photograph in question. A. M. Mantell, Capt. R.E.

(Hon. Sec. Photographic Society of Great Britain.)

8, *Mansion Row, Chatham, Oct. 15th.*

Proceedings of Societies.

The Camera Club.

On Thursday evening last week, at a meeting of the Camera Club, Mr. Francis Cobb presided.

Captain W. de W. Abney, F.R.S., read a paper on "The Density of Negatives," in the course of which he stated that a little controversy had been going on between himself and Messrs. Hurter and Driffield about the accuracy of the instruments used for the purpose of measuring the density of the said negatives. Messrs. Hurter and Driffield used a grease-spot photometer of small dimensions, 12 inches by 4 inches by 5 inches, and he maintained that this was not the best apparatus which could be used for the purpose. He then threw upon the screen a small disc of light by means of the optical lantern, and pointed out that when a negative was suitably interposed some of the light was scattered, and feebly illuminated the screen for some distance outside the disc proper. The light which is scattered in passing through a negative causes the chief difficulty in measuring the intensity of the

latter; it amounts to more thau 5 per cent. of the whole light, and of this scattered light the grease-spot photometer measures very little. Lantern slides sometimes give darker images than are expected, simply because much of this scattered light does not reach the screen; he thought collodion slides likely to give the better results, because they scatter the light less. By the plau of Messrs. Hurter aud Driffield more of the scattered light was measured than should be the case, and they measured the scattered light where it was most intense. As for the grease-spot photometer, he asserted that whether they took their measuremeuts from the position of equal illumination, or from the vanishing position, the results were the same, and this they denied; if they obtained a difference there was something wroug in their method of uneasuremeut. He maintained that his own method of measurement, by meaus of a dise with sectors, gave absolutely trustworthy results, and that the hundred per cent. of error which Messrs. Hurter and Driffield asserted it to yield was, in reality, in their own method of measuring. His own instrument was as perfect as human hands could make it, and he had tested it by differeut lights; the rotating sectors cut off exactly the amount of light they should do, and any error due to scattered light was a constant, running through all the experiments alike. He theu described apparatus and a method of measuring the amount of the scattered light. Next he dealt with the problem whether the time of exposure and the intensity of the light are equal, and said that, so far as his experimeuts had gone, the answer must be "Yes," when the time of exposure is measured by seconds. Whether the law holds good with very short exposures is a question; he was disposed to imagine that it does not hold good. Questions as to the viscosity of the ether aud the energy of the light then come in. Astrouomers believe that they have evidence that such viscosity exists, and that it quenches some of the light from the heavenly bodies which otherwise would reach the earth. Experiments on the lines he had just laid down might, he said, perhaps give the means of measuring absolutely the resistance of the ether, thus enabling the problem to be attacked from an entirely new direction.

In reply to various questions, Captain Abney said that he thought that in taking pin-hole photographs, the operator was beginning to feel the practical effects of the viscosity of the ether. He said that when his rotating disc apparatus was driven with great velocity by means of a whirling-table, white light passing through the sectors appears violet, but that this is a physiological and not a physical phenomenon. Paraffin lights do for use with his apparatus; they are uniform enough after they have been burning a quarter of an hour.

The London and Provincial Photographic Association.

October 9th.—Mr. A. L. Henderson in the chair.

Mr. F. A. Bridge showed two prints from negatives taken at the previous meetiug by Mr. Roberts with his flash-light apparatus; one of the negatives was developed at the time by Mr. Roberts, the other Mr. Bridge had developed in his own dark-room. A print from the former took two days to print; the latter negative required only ten minutes.

The subject for discussiou for the evening was as to the advantage of the use of large objectives in optical lantern work.

Mr. Freshwater said: Time has not not allowed me to put my remarks down in the form of a paper, but I hope I shall be able to show that all this talk about large objectives for the lantern is not of value, except, perhaps, as regards appearance and outward show, which, by-the-bye, go a very long way with some people. I was once in a hall getting ready for the show, when a lady came up; she looked at the lantern very studiously, as if she knew all about it, aud turniug to me, said, "What a beautiful lantern! It seems quite a pity to use such an instrument." On another occasion I had a small tin lantern on the table, when soue noble "swell" remarked, "You are not going to show that thing?" I said indeed I was. After the exhibition I did not see him. But enough of this. First, perhaps, I should show you the cone of light as it passes from the condenser to the front lens. Now, if you are using a short-focus condenser, one that is usually supplied with a lantern for limelight, you will find the cone comes down to a point at about nine inches, and then it crosses; now, if you place a six-inch lens in this cone at its right place—that is, at its focus with the picture in the lautern—you will see that the diameter of the spot of light is about oue and a-half inches in diameter, so you see a two-iuch lens is quite large enough to pick up all the rays from a four-inch condenser, and carry them to the front combination; but if you place an eight-inch lens, this same cone of light has come down very much, and is almost ou the cross, so that there is not enough light to fill the lens so as to illuminate the whole of the disc, as I shall presently show. I intend to put on lenses of different forms—the old meniscus pair, single achromatic, using in front of both of these a stop about one-third of the diameter of the lens. This stop is necessary to cut off the outer peucils of light, and give a flatter field and better definition. The other lens is a combination of the portrait form, but altered in the curves to give a flatter image on the screen. Now, if you use a large lens of this form of about eight inches iu focus with the same condenser, you will undoubtedly gain some considerable advantage. It will pick up the rays better than the small lens, and cover the disc much better, but you increase the size of all your fittings, and the weight of the lantern you have to carry. Some will say that is of no consequence; you must have a cab; a pound or two is of little moment. That is all very well, but a set of such lenses is rather a serious matter. Now, if you alter the condenser in such a way that the cone of light is longer, you will then illuminate the smaller lens, as I will show, and get as good a picture as with the large objective. Then comes the questiou of definition. It does not matter for long-focus lenses what form is used. A siugle lens will give just as flat a field as a compound lens, and pass more light. This will apply to lenses of above ten inches in focus.

Mr. Baker said that the marginal rays were cut off by the mat of the transparency, otherwise a 4-inch condenser could not be worked up to its full liuit: he would prefer $4\frac{1}{4}$. At one tiue he was in favour of small lenses, but he was quite converted into using lenses of large diameter, especially for long distance work. He considered the gain in illumination was worth the extra weight. Condensers that answered well for a three or four wick oil lamp were too short in focus for the lime-light. He cousidered the best form of condenser to be one composed of a meniscus and a double convex lens.

Mr. Freshwater thought this form of condenser had no advantage over the two plano-convex lenses, especially for long distance work.

Mr. J. Traill Taylor said that it was quite possible for a large condenser to focus to a small point. Mr. Grubb had projected the whole of the light of a condenser through a quarter-inch microscopic objective; therefore, assuming other conditions to be perfect, there could be no advantage in increasing the diameter of the object glass. A condenser to be perfect required three lenses. Mr. Taylor gave an illustration on the blackboard of a lens he had devised some time ago, showing the advantage of separating the lenses, by which a flatter field was obtained. The position of the luminant with regard to the condenser was important, the effect of increasiug the distance being to shorten the coujugate foci, and thereby to allow a large object glass to be used close to the condenser.

Mr. T. E. Freshwater contended that, using a 6-inch front lens, a 4-inch condenser was quite sufficient.

This being the opening night of the lautern season, a number of transparencies was projected on the screen, contributed by Messrs. A. L. Henderson, Cembrano, Medland, Wollaston, and Chang.

Hackney Photographic Society.

A private auctiou was held last Thursday, under the directorship of Mr. Henry J. Beasley (a member). The idea was that many amateurs bought apparatus which was found useless to them, but might be useful to others; little, if any, reserve was placed on them. Mr. Beasley gave a humorous description of the various articles.

Mr. Wm. Smith showed a new repeatiug flash-lamp, which

was handed round. The repeating action was brought about by a spring, which caused a box full of powder to discharge a given quantity into a small chamber, and on releasing the spring the box went back. The flash was caused by magnesium being blown upwards through a spirit stove.

The Fry Manufacturing Company sent samples of their various specialities, which were duly distributed; the members were requested to report the result of their trials.

Messrs. Mawson and Swan sent copies of "How to Make Lantern Slides," also some enlargements.

West London Photographic Society.

The annual general meeting took place on the 10th inst. at the Lecture Hall, Broadway, Hammersmith, Mr. C. Bilton, president, in the chair.

Mr. Whiting moved that Rule 5 be amended by striking out the clause which provided that the president be not eligible for re-election. He thought it undesirable, speaking generally, if a society possessed a good president, not to give the members an opportunity of re-electing him. They could not do better than follow the example of the parent society, which had not changed its president for many years.

Dr. Low, while admitting that there was something in favour of Mr. Whiting's argument, pointed out that the converse was equally applicable: an unsuitable president might be elected, and if the motion were carried the opportunity for selecting a subsitute would to some extent be lost. The alteration was made in order that every member should, like the French soldier, have the marshal's bâton in his knapsack, or, in other words, stand an equal chance of occupying the presidential chair.

Mr. Winter thought, putting both arguments in the scale, that the unpleasantness which might arise if the rule were rescinded would quite counteract any possible benefit from the change, and therefore hoped the meeting would allow the rule to stand.

Mr. Hodges had always looked upon the rule as being contrary to the interests of the Society; it was, moreover, contrary to the original constitution, and he should like to see its abolition. He hoped that his remarks would not be construed in a personal sense.

Mr. Whiting, in reply, thought that in the election of officers it should not be supposed that the person voting entertained an unfriendly feeling for the person for whom he did not vote. They would not be doing justice to the Society if they did not act independently.

The President said, as the proposer of the resolution last year, he should be sorry to see it rescinded, he having suggested it mainly upon the ground that an annual change in leadership would be beneficial to the Society, and would give every member the opportunity of so studying the interests of the Society that he might be elected to the chair.

The motion having been put to the meeting, was negatived by a majority of one. A discussion then ensued on the financial statement, and resulted in the adoption of the following resolution: "That all subscriptions become payable on the 1st of October; old members whose subscriptions are paid to the 1st of January to pay three-fourths of the full amount."

Further revisions in the rules having been made, the election of officers was proceeded with, but owing to the lateness of the hour the meeting was adjourned to the 17th inst., when, bearing in mind the importance of the business, it is earnestly hope that all members will make a special effort to attend.

Sheffield Photographic Society.

The annual meeting was held at the Masonic Hall, Surrey Street, on Tuesday evening, Mr. B. J. Taylor in the chair.

The Treasurer's statement of accounts for the year showed a good balance in hand.

The Secretary's general report stated that some good work had been done by the members, several having gained prizes at the photographic exhibitions in different parts of the country, notably Mr. Ernest Beck.

The election of officers for the ensuing year resulted as follows:—*President*—Mr. B. J. Taylor, for the second time; *Vice-Presidents*—Mr. A. Davy and Mr. G. Bromley; *Council*—Messrs. A. Reynolds, A. J. Brown, T. Furniss, Thos. Firth, and W. Spencer; *Secretary*—Mr. Ernest Beck; *Treasurer*—Mr. Bradley Nowill; *Reporter*—Mr. E. H. Pearce.

The President's prizes are again offered for competition.

Yarmouth and Eastern Counties Photographic Society.

On Wednesday evening, the inaugural meeting and entertainment in connection with the above Society was held in the Supper-room at the Town Hall. Invitations were sent out to a number of ladies and gentlemen, and so many responded that by the time the proceedings commenced the room was full to overflowing, and many had to stand, while others could not even obtain admission to the room. Round the walls of the room, and also outside on the landing, were a quantity of very fine photographs of Yarmouth and places in the vicinity, which clearly demonstrated that the work of the amateur photographers of Yarmouth is indeed of an excellent description, two cases of scenes on the beach and river, by Mr. C. Rumbold being much admired. The Mayor (Mr. J. W. B. Johnson) occupied the chair, and among others present were the Rev W. T. Goodrich, Col. Dixon, Mr. H. D. Arnott (president), and Mr. Harvey-George (hon. secretary).

The Mayor, in opening the proceedings, expressed the pleasure he felt at seeing so many present at the inaugural meeting of what he thought would prove to be a very important society in the town. He had no doubt that in a few months it would become a great and important body.

Mr. Harvey-George remarked that he was very pleased to see such a large attendance, and thought it bid fair for the prosperity of the Society.

Mr. Arnott, as president of the Society, also addressed the meeting, remarking that it was evident great benefit was derived from those societies by the constant demand for others. All liked to have sympathy and help in their work, and their needs were met by assembling together to relate successes and help one another in doubts and difficulties. Photography had gained such a hold upon the town and locality that they felt justified in establishing a camera club, which was sure to be of great assistance in forwarding and developing all matters connected with photography. He hoped no exclusiveness would be shown; the Society was open to amateurs, professionals, and ladies, and he hoped they would help each other, and not encroach on the trade of the profession. Rivalry was a good thing when carried out in a friendly spirit. No bitter jealousies must creep into the Society, but each must try to out-do the other in thoroughness of work. At the monthly meetings the practical working, different methods of printing and toning, would be dealt with, and papers read by the members. He hoped before the end of the year the Yarmouth Society would be reckoned among the most important, not only in respect of numbers, but of good work.

Several songs were well rendered and appreciated at intervals during the evening by Dr. Tipple, Messrs. C. Paucheu, and W. D. Tonkins.

The evening concluded with a lantern entertainment illustrating Boston, U.S. The lantern was lent by Mr. C. Rumbold, who also exhibited the slides, which were lent for the occasion by the Liverpool Amateur Photographic Society. A descriptive lecture, read by Mr. Harvey-George, added to the interest of the evening.

Croydon Camera Club.

A meeting was held on October 9th, with Mr. H. Maclean, F.C.S., in the chair.

The result of the competition for prize given by the President for "Views on the Wandle" was announced, the prize being awarded to "The Wandle at Beddington," by Mr. H. E. Lewis.

Some excellent work was sent in, and a large number of instantaneous views and animal subjects was exhibited.

A letter was read from Mr. L. De Clercy resigning his ap-

pointment as hon. secretary, and Mr. G. R. White was elected his successor.

A social meeting will be held every Wednesday, when visitors are cordially invited.

Photographic Society of Ireland.

The first meeting for the session was held at 15, Dawson Street, Dubliu, on the 10th inst. The chair was takeu by vice-president Dr. J. A. Scott, who regretted that the president (Mr. George Mansfield) was uot able to be preseut, owing to a family bereavement, to deliver the address anuounced, but that Mr. Greenwood Pim had undertaken to say a few words.

Mr. Greenwood Pim, in the course of his address, said that that meeting was the second of what might be called a public character in those rooms. Nearly twelve months before the rooms had been acquired by the Society, and at that time the number of members was about eighty ; since theu they had uo less than sixty new members, and he thought that fact afforded no doubt whatever of the propriety and advautage of having taken those rooms. By death and resiguatiou they had lost three members, and the total number was now 137. Their expenses were much larger thau they had been in oldeu times, aud the life of a society was to keep a constant influx of new members. He suggested that if a member were uot prepared to write a paper himself he might suggest a subject on which a paper might be desirable, and they would eudeavour to get some one to take up the subject so suggested. He also announced that arrangements were being made to obtaiu loans of the American sets of lauteru slides, aud in addition that the Society was about to organise a loan collectiou of its own. Mr. Pim concluded by hoping that the dark room would be largely utilised, aud that the members, especially the younger oues, would take advantage of the "Questiou Box."

The meeting was brought to a close by the exhibition of a number of the Society's lautern slides, the work of the older members of the Society, most of them having been taken on wet plates aud in the early days of the gelatine dry plates. The lantern was worked by Messrs. J. H. Hargrave and M. Hedley.

Dundee and East of Scotland Photographic Association.

October 9.—General meetiug.

Mr. Andrew Stewart, Editor of *The People's Friend*, gave a lecture on "How Our Morning Paper is Laid on Our Breakfast Table." The lecturer described the various details in connection with the production of a daily paper, from the receiving of "copy" to the despatching of the papers to the railway station. A series of lantern slides illustrating the different processes carried on in a newspaper office was thrown upon the screen, which gave the members a realistic view of the working of a newspaper establishment.

Mr. V. C. Baird exhibited a number of prints on Fallowfield's aristotype, toned iu the ordinary borax touiug bath.

The Photographic Club.—The subject for discussion on October 22nd will be "Photographic Copyright ;" October 29th, First Lanteru Night of the seasou—Slide Competition ; November 5th, Annual general meeting.

Nature says that at the British Association, Mr. F. H. Varley exhibited and explained the action of a new direct-reading photometer— au ingenious and compact instrument, iu which intermittent illumination is employed for equalising the intensity of illumination from two sources of light.

Spectacle Glasses.—Making glasses for spectacles is work requiring great care. The grinding of lenses is accomplished by placing them on an oval form embedded in a cement-like substance, which, as the operation proceeds, hardens, and thus holds the lens in position. Over the form is placed a bowl, and this moves upon the lenses in a manner closely resembling that produced by moving the palm of one hand in that of the other. The material used for grinding is vermilion. The glass for the lenses is imported, chiefly from Germauy and France, and colourless crystal glass makes the best lens, better, indeed, than Brazilian pebbles or rock crystal.—*Detroit Free Press.*

Answers to Correspondents.

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

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

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

Professor Silvanus Thompson, of the Finsbury Technical College, invites his Manchester friends to search for the portrait of William Sturgeon (inventor of the electro-magnet, &c.), which is known to have been in the possession of his only daughter, until lately residiug in that town. Should auy of our correspondents know of its existence and whereabouts, they are informed that a photographic reproduction of the said painting is much desired. See refereuce made to it iu last week's *Journal of the Society of Arts.*

Sept.—*Punch's Illustration.* Harry Furniss' cartoon descriptive of the ubiquitous amateur photographer, on page 166 of the 4th inst., is a humorous bit of criticism. We think with you that the word "pest" is not very complimentary, but *Punch* will always take full license, and we must not look for exceptional treatmeut.

A. E.—*Slow Toning.* It may happen that your ready-made toning bath is suffering from the cold at nights ; try the effect of warming it, and if this does not prove successful, stimulate it by adding some freshly mixed gold solutiou.

P. L.—*Chronological Record.* The twenty-four pages in Mr. J. Werge's book, "The Evolution of Photography," devoted to historical record gives the best account we have seeu of the successive steps of photographic progress, since Robert Hunt's general summary, published iu the first volume of the *Photographic Journal*, and Mr. Jerome Harrison's later epitome.

Albumen.—*Sensitised Paper and its Faults.* 1. If you use a 70-grain solutiou of silver nitrate to make good the diminution of bulk, the strength of the bath would be kept pretty uniformly to 60-grains. 2. The perfectly straight lines in the sample sent lead one to suspect that they are either pencil marks or an original fault in the paper. 3. Mr. England makes his own. 4. The causes of fading are numerous and diverse ; one cannot specify without seeing a sample. Were the prints mounted ?

G. C.—The address of Dr. R. L. Maddox is Greenbank, Park Road, Perlswood, Southampton.

M. E.—*Measuring Pyrogallic Acid.* The oft-repeated weighing out of small quantities is inconvenient, and measuring unsatisfactory. Perhaps the best plan is to dissolve up the whole ounce iu a measured quantity of water, adding a few drops of nitric acid or other preservative, and make up to the bulk of fifteen fluid ounces. Call this a thirty-grain stock solution, aud dilute it according to the strength required for use. The bromide ought to go in with the ammonia rather than into the pyrogallic solution, although some formulæ prescribe the latter course.

W. S.—*Half-Tone Zinc Blocks.* You will find fifty pages devoted to the preparation of zinc plates iu Mr. W. T. Wilkinson's new edition of "Photo-Engraving" (Hampton, Judd, & Co.). We cannot attempt to supply working details in this column.

B. N.—*Kallitype Developer.* Prints taken to about one-sixth silver exposure, are floated face downwards for ten seconds on

Nitrate of silver...	... ...	50 grains.
Citrate of soda ...	... ...	800 ,,
Bichromate of potash	...	...1 to 2 ,,
Water	... ...	10 ounces

To which solution add 1 drm. of ammonia (which should just re-dissolve the precipitate first formed); then add 35 drops of nitric acid.

R. L., A. M. M., J. W., Experimenter, and A. G. G.—Received.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE PERMANENCY OF PHOTOGRAPHIC PRINTS.

THE powers possessed by photographers of obtaining prints of various desired tones at will are now large, so that when any new method of toning is brought before the public, a chief point of interest is the amount of permanence of the results, and to leave the problem to be settled by lapse of time alone is neither altogether necessary nor desirable.

When Mr. Lyonel Clark, last week, was expressing confidence at the Camera Club that some of the results he had obtained were more permanent than if he had used ordinary albumenised paper, it seemed to us to be a pity that a store of chemical solutions for testing prints was not upon the premises, and strips of some of the prints immersed in them while the speaker was addressing the meeting. A little diluted sulphide of ammonium, for instance, with one of the prints soaking in it, would have given emphasis in the one way or in the other to the remarks. Why should not some photographic organisation appoint a committee to consider the best series of chemicals and proportions thereof to be used in testing prints of any kind, and, after coming to a decision, recommend that such test solutions should be kept always on hand by every photographic society throughout the world? Experiments conducted anywhere with these solutions at the same temperature, and with the same times of immersion, would then be comparable with each other wherever performed.

When certain liquids ruin a particular photographic image, evidence is not thereby necessarily obtained that time will do the same, but information is thereby given sufficient to form a basis for argument, and sometimes for tolerably correct predictions as to the stability of the prints in the future. For instance, blue ferro-prussiate prints are attacked with the greatest ease by alkaline solutions, but as they are not likely to be so attacked in pure air, the prints are tolerably stable, as engineers know. If some of Mr. Lyonel Clark's heavily toned prints had been immersed the other evening in various standard test solutions side by side with some prints heavily toned by gold, like those recently produced by Mr. Scholzig, much more would have been known than at present as to the probable relative durability of the two classes of pictures.

Over certain photographers the word "platinum" has as sacred an influence as the word "Mesopotamia" had over the old Scotchwoman after she had heard it used in a sermon. Gold is an excessively permanent metal under atmospheric influences, and toning either by gold or by platinum seems to be but a surface action, so that at present there is no evidence before the public, so far as we know, that prints toned with the one metal are, in average batches, more permanent than those toned with the other.

The faded monstrosities in family albums, kept constantly before the eyes of visitors because of the interest in them due to the personality of the sitter, have done much to lessen public respect for photographic work, and to give rise to the expression, "only a photograph." Such influences have tended to give rise to a partial revival of the old art of miniature painting in cultured society, and it will be good for the photographic profession if, as soon as possible, it begins to turn out nothing but stable work.

Mr. Clark ascribed the yellowing of the whites of some of his prints to the palladium salt. Has anyone tried whether, like platinum, it enters into combination with gelatine? Mr. Willis avoids gelatine in platinotype papers because of the consequent yellowing of the whites under adverse influences. The old silver-pyrogallol intensifier used by Mr. Clark on paper prints might be expected to degrade the whites, though, perhaps, in the presence of plenty of acetic acid this defect may be avoided. At such meetings as that now under notice, not alone should test solutions be at hand, but a magnesium lamp, by the aid of which to examine the quality of the whites of the prints. It is desirable that at the end of any meeting of a photographic organisation, those who attend shall feel that the time they have given has been fully utilised, and it is easy enough, by means of testing solutions, to get some idea of the probable durability of any class of photographic prints.

GELATINO-CHLORIDE PAPER.

Last week we had occasion to allude to the fact that there were certain printing processes which give extremely promising results, and which present some advantages when compared with the ordinary albumenised paper. These processes are mostly of foreign origin, or perhaps it would be more correct to say that the prepared papers for practising them are not of English make, but are due to the enterprise of Continental neighbours. The papers have fanciful names, but they mostly bear a coating of silver chloride in gelatine.

It is difficult to understand why our own manufacturers have allowed this branch of photographic industry to remain in the hands of foreigners. Bromide paper was conceived, and its manufacture carried out in England long before it could be obtained elsewhere, and chloride paper would seem to be a natural outcome of that enterprise. Why it should chiefly be made abroad is a problem most difficult to solve, for we have had no strikes among photographic employées to drive away trade, and it is not pleasant to English workers to see that constantly recurring and exasperating label on all kinds of goods, "Made in Germany." But this is the case now-a-days with most things, and certainly it is with gelatino-chloride paper, although it may be called by some other name.

This process for printing photographs takes two distinct forms. First, we have a paper which is exposed to artificial light, and is afterwards subjected to a developing process. We first heard of this under the name of alpha paper, five years ago, when its introduction by Messrs. Marion was signalised by a long descriptive article in the *Times*. This paper, it will perhaps be remembered, was used in conjunction with a clever automatic printing machine invented by Mr. John Urie, of Glasgow. A negative was placed in the upper part of a box-like structure, and above it was a crown of gas burners. These burners were turned on at short intervals for a given time, and a strip of paper running over drums actuated by clockwork passed beneath the negative for the necessary exposure to gaslight. The unbroken strip of paper was then developed, and a dozen or more pictures, side by side, and all of the same tone and density, were the result of the operation. This was an extremely valuable process to any photographer in a large way of business where quick results were necessary, for a dozen prints could be delivered, mounted, and finished a few hours after the negative was received, and quite independently of the vagaries of daylight.

The other form in which the gelatino-chloride process is presented to us is a printing-out method, and it is this process to which we must look for the finest results and the widest adoption. Let us enumerate some of its best points. It is far more sensitive to light than ordinary albumenised paper, as anyone may prove by exposing a strip of each to daylight side by side. Long after the gelatine paper has assumed its darkest tone the other is struggling through its usual course from pink to brick red. Next, it is easier to tone than its older rival, and, what is more important, will yield a variety of colours which are impossible with any other medium; indeed, the wonderful colour scale which is possible on lantern-slide plates coated with gelatino-chloride emulsion, and which can be coaxed from them by making slight variations in the composition of the developing fluid, are naturally possible with paper which has been treated with an emulsion of the same composition. The next advantage which may be credited to this kind of paper is the marvellous richness of detail and brilliancy which distinguishes the prints made by its aid, by the side of which prints on albumenised paper appear dull and flat. Nor are these results only achievable from a first-class negative, for one which is thin, and which would yield but a ghostly image by other processes, will give fine results on this gelatine paper. At will, we can produce a matt surface on the finished print, or one with a high gloss, and this is a distinct advantage, for both have their admirers. Lastly, the paper does not quickly deteriorate, but, with ordinary care, will keep good for many months. There is also good reason to believe that the pictures printed upon it are permanent in character.

Most of us have been deploring the great rise in the price of platinum, which is now very nearly that of gold, for it cannot but adversely affect the employment of the salts of that metal in photography; but this ill wind will blow for some good if it only should turn renewed attention to the neglected printing process to which we have adverted. We use the words "renewed attention," for our readers must not forget that between four or five years ago we devoted a good deal of space to the consideration of this subject, and published a series of articles which gave information concerning the methods of compounding the emulsion, and applying it to paper and other supports for positive printing. "Life is too short," many will say, "for us to attempt to make emulsion, or to coat paper for ourselves," and we are inclined to agree with them. Still, it is right that every photographer should know as much as possible about the composition and manufacture of the agents which he uses, and, with this view, his attention was called to the subject. Let us hope that those who have not yet seen how their pictures look when printed on gelatino-chloride paper will try the experiment.

How Will You Take Me?—"I think photography is very interesting," she said to a young man who is in that line. "Yes, it is." "I should like to have you make a picture of me." "With pleasure." "How would you prefer to take me?" He looked at her with a face that showed deep thought, and then replied, slowly, but in a firm voice: "For better or for worse, by all means."—*Washington Post.*

A Wonderful Invention.—Mr. Edison has, say the newspapers, made another wonderful invention. He attaches an instantaneous photographic camera to his phonograph, plants his two lethal instruments right in front of the orator, and sets them to work. The phonograph records every syllable that falls from his lips, every 'hem and er,' and mispronunciation, while the lightning camera simultaneously photographs eight or twenty times every second the movements of the speakers. Then the photographs are projected by a magic lantern the size of life, the phonograph is set going, and the oration can be delivered *ad infinitum.*—*American Journal of Photography.*

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Considering the enormous number of amateurs at work all over the United Kingdom, and the devotion they show towards "instantaneous" work with "detective" cameras of every conceivable design more or less complex, it is curious that so small a result is seen in the Exhibition. In fact, it may be said with truth that there is no result at all. The reason of this disappointing outcome can only be conjectured. Instantaneous photography, in appearance so simple, is, in the reality, surrounded by difficulties. What can be easier (in theory) than pointing a camera and pulling a trigger? Hundreds of amateurs have started full of enthusiasm to point and pull, and peradventure to develop, and have ended in disgust with their plates, their apparatus, and themselves. The most experienced of instantaneous workers cannot guarantee success, and frankly own that their best pictures are "flukes;" and if this be so, what must be the lot of the hapless amateurs who take up photography—as most of them do—in the firm belief that they have only to point and pull. The number of spoilt plates and ruined films representing the great bulk of amateur efforts must be perfectly appalling. No doubt failures make good for trade, but is there not a risk of a reaction setting in? The craze for speed is fatal to art. The proportion of artists among amateur photographers may fairly be estimated as very small, and if the sole attraction to the average amateur be the possibility of taking an instantaneous picture, as it is to be feared it is, we may be sure that his taste for photography will not be lasting. One does not like to be a prophet of evil, but, judging by the present Exhibition, there is nothing to encourage a belief that photographers are enlarging their ranks.

To deal with this subject in all its aspects would, however, occupy too much space, and I leave it at this point and return to the more immediate matter in hand. Close to Mr. Dresser's instantaneous pictures already mentioned is a clever seascape by Mr. Ernest A. Shipton, "The Return of the Smack" (No. 161), the only defect of which is the unfortunate perpendicular shadow thrown by the mast. Mr. Shipton also sends an effort in another direction, a picture of an old woman who is, to quote the title, "Dreaming the dreams of long ago." There is a superabundance of old women's pictures in the exhibition, and I do not know that Mr. Shipton's dreaming old lady is any better than the rest. Mr. J. E. Austin, besides his medal picture, has a number of others, all marked by the same care and taste, No. 178, entitled "Chaff," being particularly meritorious. Work such as Mr. Austin shows is always welcome; it is unpretentious, and thoroughly conveys the meaning intended. Mr. S. Bourne, in his series 190 to 201, is as neat in his manipulation as of old. Mr. W. Wainwright deserves a passing mention for his English landscapes (Nos. 223 and 228), and Mr. William Atkinson has been very happy in his selection of a view on St. Paul's Cray Common (No. 237). Mr. Frank M. Sutcliffe is too skilful and experienced a photographer to show anything which is not thoroughly good, and his series (No. 251 to 257) has all the qualities with which his work is identified.

Mr. L. E. Westropp exhibits an excellent series of Elmley Castle Church in Nos. 265 to 267, and is equally successful in a view of York Minster (No. 264). Mr. R. S. Redfield deserves commendation for his three pictures, "A Berkshire Hillside," "Wending their Way," and "Hesitation;" but the appropriateness of the two last titles is not quite evident.

Mr. G. Davison's series of pictures (Nos. 289 to 298) does not challenge criticism, as do his more ambitious attempts which have already been mentioned. Yet they are out of the beaten track, and for this reason alone they are acceptable. But they have distinct merits of their own, and will certainly find many admirers.

In No. 310 Mr. Karl Greger gives us some admirable examples of what may be called the old school. After all there is a distinct charm in the delicacy and sparkle which belong to what may be called a purely photographic effect. Extreme sharpness may be offensive to some eyes, but it certainly conveys the effect of sunlight, and this, in these days of sombre tones, is something to be grateful for.

Mr. Matthew Whiting has well utilised his time in his "Country Rambles" (Nos. 313 to 315), but has come slightly to grief in the grouping of the children in No. 313. Children in photographs fully answer the description of a certain young lady who, "when she was good, was very good indeed; but when she was bad, she was horrid." Mr. Whiting's children approach the horrid stage. There they are, all of a row, and all staring at the camera. I dare say it was not Mr. Whiting's fault, for the "cussedness" of children when you want them to do the thing they will not, is too well known.

Mr. J. M. Nisbett has, in his time, done so much good work that, judged by his own standard, his "No Tidings" (No. 323) is disappointing. The figures on the cliff are well enough in pose, but their faces do not invite sympathy, and they appear to be enveloped in a fog appertaining to a "London particular." It may be supposed that Mr. Nisbett intends to represent the dusk of evening; but this is not certain.

Not far from Mr. Nisbett's picture Mr. Ralph W. Robinson's work appears in full force. Farm scenery and life have an irresistible attraction for Mr. Robinson, and he cannot tear himself away from them. What a man chooses to photograph is a matter which concerns himself, and, doubtless, Mr. Robinson finds variety in bucolic subjects; but it may be doubted whether the spectator derives similar pleasure. The models of the fields, whether men or women, are usually stolid persons, in whom it is difficult to infuse anything like expression, and that Mr. Robinson has succeeded so well is to his credit; but is the game worth the candle? Take "Home to Dinner" (No. 331), for instance. The group of figures is arranged with exceeding cleverness, the picture is a well-balanced one, the surroundings are in keeping; but can anyone get up more than a languid interest in the picture? This seems to be the fault of most of Mr. Robinson's work. He fails to fascinate, and lacks that indescribable quality which causes the spectator to linger in front of a picture and return to it again and again. "A Helping Hand" (No. 25) is an example of what may be called missing the point. The keynote of the picture is surely a sad one. An old woodcutter and his wife, bent double with rheumatism and monotonous toil, trudging along under the weight of their burdens, if suggestive of Millet, would at least have been in harmony with the scene; but Mr. Robinson's woodcutter, though supposed to be in need of a helping hand, is neither old nor feeble, while his theatrical attitude is one which it is extremely doubtful a woodcutter ever assumed. If Mr. Robinson bestowed as much care upon the selection of his models as he evidently does upon his photography, how much his pictures would gain. Wide-Angle.

STEREOSCOPIC PHOTOGRAPHY *

BY G. W. WATKINS.

The stereoscope is an instrument by means of which the pictures are presented to the eyes under practically the same conditions as those which obtain when we look upon the natural scene with binocular vision. That the instrument itself is not necessary to enable many to combine the views is a well-known fact, the conditions being that the optic axes shall be so directed that the right eye sees the right-hand picture on the mount, and the left eye the left picture.

It is an unfortunate fact that the stereoscope has fallen away so much in popular estimation. Many attempts have been made to resuscitate it, but so far, I do not see anything like a permanent revival; and it is very rarely indeed that one sees a pair of lenses in use by an amateur. This leads me to ask how it is that, with all the advantages which the gelatine plate offers, this beautiful department of photography is so neglected? To the modern form of camera with its tapering bellows must be attributed a share of the blame, inasmuch as a pair of lenses cannot be mounted upon the front board of such a one. To the possessor of a camera of square form of half-plate or larger size, the only addition necessary is a central division to prevent the fields of the two lenses interfering with each other. I have mentioned a "pair of lenses" above as being the usual method of working, and show such a pair of the single meniscus form of four and a-quarter inches focus which I generally use; but when I started to take stereoscopic views I employed the one-lens arrangement, which I will now describe, as it is quite as efficient as the first-mentioned plan. The sliding cross front carrying the lens is first pushed to one of its extreme positions, the view focussed, then going through the usual routine.

After exposure and re-capping the lens, all that you have to do is to pass the lens over to the other extreme position and again expose. This system of working has the advantage over the special pair of lenses, inasmuch as any lens already in your possession from, say, four inches to seven or eight inches focus may be used. Of course, there is the drawback that objects may have moved during the time between the exposures, but many subjects may be taken by this method when other means are not available; indeed, the movement of small objects, such as persons walking about in a street scene, is not of the importance that might be supposed, many of the older slides being taken by the one-lens arrangement as above, examples of which I produce.

Premising that a half-plate camera will be the size most used at the present time to produce stereoscopes, it becomes a matter of importance to determine the best separation of the lenses (and consequent distance, centre to centre, of the pictures on the negative), because a very small margin exists in the length of 6½ inches (that of a half-plate) from which to cut two pictures, each 2¾ inches wide, after making allowance for the rebate of the slide at each end and the division in the middle. I find that 3⅛ inches is about right; with any material departure from this distance there will be a difficulty in getting the same subject on each side, and still keeping the right width of picture.

As to the matter of exposure, it goes without saying that it must be equal for each lens, and the diaphragms rigidly exact in size. The older stereoscopic pairs were frequently furnished with a double flap-shutter, opened and closed by hand, and this, no doubt, was efficient. Personally, I prefer the double cap for time exposures (and I have attempted none others), and experience no difficulty in removing and replacing it without shaking the camera.

Those possessing a 5 by 4 or quarter-plate camera and outfit can practise stereoscopy without any addition at all to their ordinary appliances, the only departure in working being to take one view as usual, then to move the camera legs, one at a time, to the new position of three inches or more to the right or left, and make the other exposure, taking care that the camera is maintained fairly level and pointed to the object. The development of both plates should take place in the same dish.

My remark, as above, concerning the lateral movement of three inches *or more* reminds me that in a class of views in which there is no immediate foreground, such as one finds in mountainous localities, and where the main objects are at a considerable distance, the points of sight for the two halves may be at a distance many multiples of three inches without producing exaggerated effects, which would certainly result if the same distance were used when objects are close at hand. If this were attempted in the latter case, everything in front would appear more or less drawn out in depth; that is, a tree stem, instead of being round, would assume an oval form, with the longer axis pointing towards the spectator.

I now wish to draw your attention to the reason why it is necessary to have the two halves as they appear on the negative reversed in mounting the prints. This point has often been explained, but many do not seem to master the cause for it. It is found to be necessary on account of the inverted projection of the lens upon the focussing screen, and consequently upon the plate. The lenses invert their images in each half of the camera, *i.e.*, each picture makes a half revolution *around its own centre*: consequently, when the print comes from the negative, and is then held right way up, the half which was exposed in the right side of the camera will be found upon the left side of the print, and *vice versa*, thus necessitating either the cutting of the negative or the print, the latter being usually the more convenient. There is an old method of printing by which neither negative nor print need be divided. The cause which originally obliges us to reverse the prints when printing by contact is ingeniously taken advantage of when copying with lenses in the camera in making transparencies, when, by a second optical inversion, the original positions came back again correctly without further manipulation.

In order to show distinctly the difference between a reversed and a non-reversed print, I have made (for the purpose of this paper) a wire model of a pentagonal prism, photographed it as usual, and mounted the prints—one reversed, and the other not—when the different appearance in the stereoscope is most marked, the unchanged one appearing as if turned inside out, as it were—an effect which has received the name "pseudoscopic," or false sight. The same thing takes place in an uncut print, but the eye is deceived by the physical impossibility of certain objects in the view which we know to be behind, something else appearing in front of them.

In the early days of the stereoscope, before the advent of practical photography, the objects principally in use were figures, such as can be projected in the ordinary way

* Abstract of a paper read at a meeting of the London and Provincial Photographic Association.

from two views of an object in geometrical drawing, a difference being made in the two figures by slightly altering the angle of projection, their appearance being somewhat similar to the slide of the prism already shown you; but you will understand they were not photographs, but printed as white lines on a black ground.

When photography came to the front, it was very soon seen that pictures for the stereoscope were now possible which before could not be produced, or, at least, only done in a very imperfect manner, owing to the minute difference existing in the two halves, and which it was well-nigh impossible to imitate by hand engraving. The result of this popularity was that the stereoscope was rapidly vulgarised, all sorts of objectionable slides were introduced, and this, coupled with bad mounting, either through carelessness or ignorance—the two halves in some cases possibly having been printed from the same negatives, when, of course, no proper effect could be obtained—all these combined to bring into discredit a most charming optical instrument.

I will conclude my paper by saying a few words upon the subject of mounting the prints. Although not absolutely necessary, still it is advisable to so cut them that a trifling amount more of the subject appears on the two middle margins than on the outermost ones, as mounted on the cards—about one-sixteenth of an inch is sufficient. The reason for so doing is that the picture will seem, when viewed stereoscopically, to recede behind the mount in much the same manner as if it were looked at through a window or similar aperture. The height of the prints may be left without limit when using the open instrument, but must be of such height for the old box form as will pass through it.

Levelling the camera in the cross direction when focussing will be found of great advantage when cutting the prints (before separation), because if the base and sky lines are made to pass through the same object in each of the prints, we then know that they are each in a vertical position.

PHOTOGRAPHY IN VIENNA.

The Vienna Photographic Society began its winter session with a meeting held on the 7th of October. The beautiful heliogravures on the walls by Haufstaengel, and the instantaneous photographs by V. Angerer, met with general approval; they showed up well when Professor Luckhart operated with one of Hacke and Alber's magnesium flash apparatus. Professor Luckhart mentioned the forthcoming International Photographic Exhibition of the Club of Amateur Photographers of Vienna, and took the opportunity afforded by the great part that English exhibitors are expected to take in it, to pay English amateurs and professionals the compliment of describing them as the vanguard of the great army of photographers. Dr. J. M. Eder spoke of the great gain to photographic optics by the use of the new Jena baryta glass. Mr. Einsle described his method of equalizing the intensity of negatives under development, by painting with solutions which promote the intensification or reduction of certain parts as required.

The best "kodaker" in America to-day is Miss Alice Longfellow, daughter of the poet. The finest views of the Massachusetts coast are touched off by her in the stormiest and windiest weather. Her illustrated storms are at present gracing the title-pages of a book of sea songs.—*New York Truth.*

THE PHOTOGRAPHIC TOUT.

BY JAMES MEW.

The origin of the word "touter" or "tout" is not devoid of interest. Lexicographers generally derive it from the Icelandic verb *tota*, which means to stand out, to be prominent, an etymology which would well suit that species of the genus tout which is connected with photography. But both the Icelandic *tota* and the Anglo-Saxon *totian* are chiefly used of the prominent position of the lips, whence is formed the Scotch expression "tout", for a pet, or fit of ill humour, with which Scotch word the English "pout" seems closely allied.

The general signification of tout—that is to say, one who plies for customers—may, however, be akin to that of *toot*, or the noise made by a horn. It is possible that the tout originally made his presence known by the blowing of some wind instrument, as at the present time is the case with those uneasy young gentlemen who, arrayed in a consequential demeanour and a red coat, yearn to attract the admiration, or the attention, or the custom of the public by disturbing the thoroughfares with uncanny howls and screeches of various degrees of dissonance. It is a most fortunate thing for the present generation of men that this custom of soliciting notice, which may be classed with the ringing of the muffin and, if it may be said without irreverence, the church bell, is applied to few other trades, and is gradually falling into desuetude.

The photographic tout to be considered in the present paper is himself a photographer—a photographer who proceeds on the time-honoured principle that the man who wants a thing well done must do it himself; a photographer, who stands at his own door, partly, perhaps, from a love of contemplating human nature, and partly from a disposition to philosophical reflection. But probably his main reason is that he cannot afford to pay anyone else to stand there in his stead.

Sundays and Bank Holidays are the harvest times of this photographic tout; the days on which his seeds of eloquence—unless, indeed, they be cast on very stony ground—spring up with more than the suddenness of Jonah's gourd, and bear fruit some twenty-fold and some a hundred. A paper might be written about the seductive arts which this gentleman employs to induce the public to become his customers. Conviction, we are told, affects the understanding, while persuasion subjugates the will. The photographic tout seldom meddles with the former, possibly because of an opinion, derived from a wide experience, that the generality of his customers have little understanding to be affected, but with the latter he is engaged from dewy morn to dusky eve. The end of his eloquence is to induce people to have their portraits taken, and to this end all his arguments are adapted. Now he will assure the lingering wayfarer that he will not detain him a minute, and now he will descant on the cheapness of his work. Now he will assure him—or rather her—that her face would make a most charming photograph, and now he will declare his own theoretical knowledge and practical skill. In a word, he will employ the necessary photographic patter.

But what, the reader may enquire, is the meaning of patter? Dr. Pusey, in a letter to the Bishop of London, in explanation of some statements contained in a letter by the Rev. W. Dodsworth, published at Oxford in 1851, quoting Tyndall's complaint of those who "patter all day with lips only that which the heart understandeth not,"

and his wonder at the blindness of the persons who think "prayers to be the pattering of many words," explains patter as the saying of Paternosters. This, however, is clearly not the meaning of patter as it is conceived by the tout. In the technical language of our own time, patter is the repetition of certain formulæ of persuasion, which are supposed to have the effect of inducing, or, rather, helping to induce, a person in doubt whether he will become a customer to purchase those articles about which the patter is used. Examples of patter are common enough in most trades, but patter is most frequently, and most copiously, and most effectively used where ignorance is supreme, and conceit holds high holiday. Hence, among what are called the "lower orders"—a term only justifiable, not, as it is commonly understood, in consideration of their wealth, but in consideration of their morality or intelligence, and hardly even then consonant with courtesy or with charity—specimens of patter may be heard on Saturday nights in connection with many articles of humble trade, from a "chaney" tea-service to a mouse-trap, from a pair of real coral earrings to a carpet broom. These rhetorical harangues, which constitute the gifted orators who use them the aristocracy of the sellers of the streets, open with the commencement and never end, save with the conclusion of the business on hand; and so it is with the speech of the photographic tout. He must continue his patter with the persistency of rain drops on a very rainy day, or all his labour will be ineffectual. Not till the customer is fairly posed opposite his camera must his well-spring of talk be dried up; and even then it is to his interest to add a few words for the benefit of possible profit out of his customer's friends and relations.

The photographic tout has been much abused. It has been cruelly said of him, when he appears at the sea-side, that he is worse than sharks. But, on the whole, the photographic tout has an honest and a busy—and, doubtless, a profitable—time of it. However, a thorn sprung up long ago in the flesh of this Sunday artist which has not yet altogether ceased to trouble him. As long ago as a quarter of a century of our swiftly passing years, a cry was raised against him for his naughtiness. The good people of that time were scandalised at what they considered his overt acts of impiety and profanation. Rival photographers who indulged themselves with Sunday holidays were especially grieved and loud in their outcries against his open indecorum. They objected to the photographic tout on grounds perhaps a little mixed, like those urged by Mr. Bung, the pious landlord of the "Pig and Whistle," in *Punch* of a few weeks ago. That severe and strict Sabbatarian is represented turning his back with extreme disgust on a band playing upon a fine Sunday afternoon in one of the parks of London to the harmless delight of some hundreds of men, women, and children, and inveighing in good set terms against the Sunday League, whose members have provided this great gratification for the people. "Sunday League, indeed," we hear him saying, "I'd Sunday League them if I'd a chance, a breaking the Lord's day and a hinterfering with my tryde!" But whether the grounds of objection were mixed or simple, it is an historic fact that other members of the photographic trade emitted shrill voices of objection, and many ideas, as their owners called them, were in their own language thrown out, which, perhaps, was the best thing, so far as their owners were concerned, that could have been done with them. One gentleman suggested the imposition of a license on all photographic professional practice; another thought a monster petitition ought to be signed against all Sunday trading; another said that the clergy and the most respectable class—a division of terms which bore rather hardly on the cloth—should take the matter in hand, but what they were to do with the matter after they had got it in hand was left as doubtful as the particular rat who was to bell the common enemy in La Fontaine's fable. Yet another respectable photographer and most honourable householder was of opinion that nothing could close these vile dens, as the premises of the Sunday artist were called in those days, but a thorough education of the general public in art; for, as he lucidly argued, though without any considerable novelty, the demand creates the supply, and if 'Arry and Sairey Jane were taught to distinguish between the artistic high-priced design and the cheap daub, they would infallibly prefer the former, a conclusion to which the adhesion of 'Arry or of his beloved is extremely doubtful, if they reflected, as they certainly would reflect, that the difference between the two prices might be more satisfactorily spent on a treat of tea and shrimps.

(To be concluded.)

PHOTOGRAPHY IN GERMANY.*

BY DR. H. W. VOGEL.

THIS graduation of the apparatus would be good for a certain height of the sun. If the height is changed, the actinic action changes to a considerably higher degree than the optical one. About the absorption power of the air for actinic rays a very few measurements have been made, so far. At vertical incidence of the sun the atmosphere will absorb about 0·20 of the red rays, 0·22 of the yellow rays, 0·30 of the green, 0·36 of the blue, and 0·45 of the ultra-violet rays.

From this, the action of the sun's rays for the several colours at different positions of the sun can be calculated:

Height of the sun.	Red.	Yellow.	Green.	Blue.	Violet.	Ultra-violet.
10 Degrees.	1·	1·	1·	1·	1.	1.
20 ,,	1·88	2·02	2·75	3·80	4·26	5·44
30 ,,	2·31	2·54	3·82	5·73	6·82	9·14
40 ,,	2·55	2·84	4·39	6·99	8·55	12·33
50 ,,	2·70	3·02	4·90	7·82	9·73	14·33
60 ,,	2·80	3·14	5·17	8·46	10·51	15·68
70 ,,	2·85	3·21	5·33	8·70	11·00	16·59
80 ,,	2·88	3·25	5·53	8·90	11·28	17·00
90 ,,	2·89	3·26	5·45	8·96	11·37	17·19

In this table the action of the sun's rays for the several sun elevations are calculated by giving the action at 10 degrees the figure 1†. One sees that while the yellow radiation increases about three times at a sun elevation of 60 degrees, the ultra-violet radiation increases about sixteen times. As the yellow radiations essentially determine the optical, and the ultra-violet particularly the actinic, brightness, the actinic action of the sunlight is five times larger in proportion to the optical action at 60 degrees. If, therefore, the optical brightness were chosen as a measure to judge the time of exposure (by estimating the brightness of the picture upon the ground glass, or

* Continued from page 811.

† That the time of exposure at less brightness must be larger, as the calculation shows, is of not so much consideration, the question being only the insertion of intermediate members.

focussing with a Decoudin photometer), we would expose five times too much at 60, if the time of exposure at 60 is correct.

These proportions are for a bright day. On dark, cloudy days, with increasing cloudiness, the condition of the actinic to the optical action increases, so that on such days the time of exposure can be taken relatively much shorter than shown by the Decoudin photometer. On high mountains the light is also proportionally more actinic than in the valley below. The colouration of the object is also to be considered, green-coloured objects requiring, for instance, a shorter time of exposure than red-coloured ones. The circumstance is still of not so much importance that the law is not so strictly adhered to, whereby at only half the brightness it requires double the time of exposure. The latter has to be increased when the brightness is reduced. This defect can be removed by the above-described graduation.

According to this, it seems, therefore, as if Decoudin's photometer were useless for photographic purposes. With consideration of the above circumstances this simple and handy apparatus should be capable of protecting against under or over-exposure. In the table which accompanies the apparatus, it has been tried to remedy the above defects by noting an unproportionally long time of exposure for only moderate brightness, to which Professor Weber has already called attention some time ago. The supposition was perhaps here, principally, that a reduction of the brightness was mostly caused by a low position of the sun, whereby the time of exposure has to be increased on account of the relatively less active action. One point seems to have been overlooked here, and that is the artistic. This is simply a matter of feeling, and cannot be replaced by any instrument.

The greatest exertion is made now to simplify photography. Boxes are made for the amateur like the kodak, requiring nothing but to turn the roller and to pull the shutter. Whether the object has got the correct illumination or not is, of course, not marked on the kodak, not to mention the artistic impression. The intelligent operator will therefore have enough yet to do. It is the same as with the hunter. A gun is easily loaded and fired off, but it is more difficult to hit the mark. The smart hunter shoots the deer; the incapable and awkward ones will spend their powder on sparrows and cats.

The magnesium flash-light still occupies the minds of practitioners and scientists. Until recently the ordinary magnesium light was considered satisfactory, which, as is well known, is poor for yellow and red rays. Attempts are now being made to relieve this defect, and thereby magnesium light has become an important factor for micro-photography. According to Dr. Röhmann and Dr. Galewsky, in Breslau, two powders proved to be particularly suitable for micro-photography. They are made in the following manner:—

Powder I. These mixtures are made (*a*) of perchlorate of potassium and magnesium in proportion of 138 : 96; (*b*) of perchlorate of potassium and acetate of copper in proportion of 1108 : 724; (*c*) of perchlorate of potassium and sugar-of-milk in proportion of 831 : 342. *a*, *b*, and *c* are mixed together in the proportion of 6 : 1·4.

Powder II.—Seven parts of perchlorate of potassium, 7 parts of neutral tartrate of barium, dried at 100-110° C., 3 parts magnesium, and 0·5 parts of chloride of sodium, are mixed.

For the ignition of both powders a salt is used consisting of 1 part of sugar-of-milk, and 2 parts of chlorate of potassium.

Powders I. and II. are completely harmless, and they explode neither by the hammer nor by slowing heating. Powder II. is used in all such cases where the application of a yellow light filter would otherwise be appropriate.

A microscopic object is taken in the following way: For focussing the object a lamp serves as light-source (albocarbon flame), which is at the end of the optical table. By means of the condensing lens the picture of the flame is thrown upon the ground glass in the well-known manner, and by application of a Zeiss apparatus, and moving the achromatic condenser, it is projected into the flame of the object. The illuminating lens is now covered with a black cloth, and the powder-carrier is pushed to exactly the spot where the ground glass was previously. The carrier consists of an ordinary stand, which carries in a muffle a strong iron wire, at whose one end is fastened a 10 c.m. long and 4 c.m. wide piece of sheet iron with bent edges in rigid connection. Upon this sheet iron a suitable quantity of the powder is placed, and on the small side a small quantity of the igniting salt of the size of a pea is put. The focussing glass is now replaced by the plate-holder, the slide is drawn, and the salt is ignited with a match. In one to two seconds the colourless flash-powder is consumed; the baryta powder burns a few seconds longer. Dr. Galewsky has shown a number of faultless negatives which were taken after this method with a Zeiss apochromatic of 2 mm. and angular aperture 4. They represent to some extent preparations of bacteria coloured with fuchsin and methyl-violet, and partly coloured and uncoloured pieces of woven fabric.

According to the latest communications from Dr. Rohmann, the strength of the above-described powder, consisting of magnesium, perchlorate of potassium, acetate of copper, and sugar-of-milk, is not fully sufficient for thousand times enlargements. In tests to obtain a greater light intensity I found that the simple mixture of equivalent quantities of magnesium (96 parts) and perchlorate of potassium (138 parts) is consumed, with development of only a moderate smoke, and produces a light of quite extraordinary strength when ignited by the before-mentioned ignition salt of 1 part sugar-of-milk, sugar, and 2 parts of chlorate of potassium. Equivalent to this "white flash-light" a "barium-chloride of sodium light" is obtained by mixing 10 parts of flash-powder with 0·5 parts of chloride of sodium, and 1 part of a mixture of 285 parts of dry tartrate of barium and 138 parts of perchlorate of potassium. Both mixtures produced, at a thousand-times enlargement and a small diaphragm, very handsome, strong negatives upon colour-sensitive Obernetter plates.

Dr. Galewsky applied the white flash-light for portraits, and obtained satisfactory results. There is no doubt that this light is also suitable for ordinary enlargements, and it may find yet a more general application.

It has oftentimes been believed that it is possible to obtain a picture with stereoscopic effect if, by means of two lanterns, both halves of a glass stereoscopic picture are projected upon the same spot, so that the pictures cover each other. Such pictures were called photo-binographs. Some asserted that they could actually see the photographic effect; others, again, denied it. Schober, in Antwerp, has now tried the matter in a more successful way. He puts into the one lantern a green, and into the other a red glass, and lets the

spectator look through a green glass with the right eye, and through a red glass with the left eye. In this manner the right eye will perceive only the right half of the stereo picture projected through green, and the left eye only the left half projected through red. The experiments which Schober demonstrated before the Antwerp Photographic Society are said to have been surprising.—*Anthony's Photographic Bulletin.*

APPARATUS AT THE PHOTOGRAPHIC EXHIBITION.

III.

Mr. Fox Shew has on view at the Photographic Exhibition a shutter to work on the hood of the lens, which deserves attention; it is small in size, is always set, renders a lens-cap unnecessary, and gives any kind of exposure at the will of the operator. It is a go-and-return shutter, and Mr. Shew states that it gives no shake. For half-plate size its weight is 6¼ ounces. This shutter, which is shown in fig. 11, is the invention of Signor G. Mattioli. There is an arrangement by which it will remain fully open to permit focussing, and, when fully open, its aperture is almost as large as the lens tube. It is furnished with an india-rubber circular air-cushion, that it may fit upon hoods of different sizes within a limited range, and means exist to tighten the pressure of the cushion by means of a screw. The shutter is made of thin steel. An improvement would be to make as much as possible of it of aluminium, to lighten its weight, which, however, is not heavy as metal shutters go. The leaves of the shutter are represented in the cut as slightly open. The pneumatic pressure for releasing the shutter has to directly overcome the resistance of the spring which works it, so more force is necessary than with some shutters, but not to an objectionable or inconvenient extent. How the shutter will work in continuous use we do not know, but it appears to be a promising instrument.

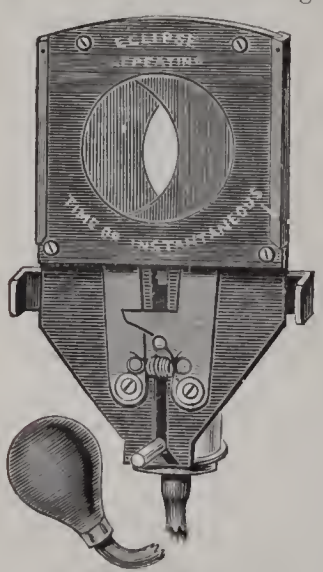


Fig. 11.

Messrs. Sands and Hunter have on view at the Exhibition a camera which they call "The Cranbourn." It is of light make, has a central swing, and the whole camera can be fixed an any part of the base-board. Automatic

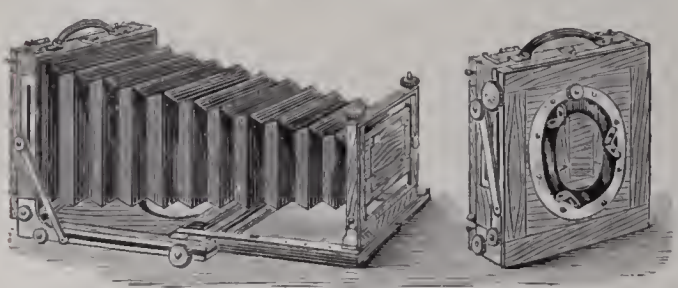


Fig. 12.

spring catches hold the focussing glass in position, and there is an improved arrangement for clamping the rising and falling front of the camera in any position. When closing the camera, the front falls into place without removing it from the runners of the base-board.

The business of the much-respected and old-established firm of Messrs. Sands and Hunter has just been purchased by Mr. J. J. Foster.

THE CHEAPENING OF ALUMINIUM.

The best aluminium combined with a small proportion of silver, seems to be one of the best alloys which can be used in the manufacture of photographic apparatus and lens-mounts.

Some of the cleverest chemists and metallurgists in this country—both with and without the aid of capitalists—are experimenting continually in the endeavour to discover a cheaper way of making aluminium; for when once the metal can be produced cheaply, one of the greatest industries of modern times will have been founded. Vague rumours from Chicago are agitating the minds of these workers to some extent, but the amount of truth in the rumours has yet to be determined: it has been said that an inventor there has found out how to produce the metal at 7½d. per pound.

Invention of last week announces that—

The new Chicago aluminium manufactory is assuming a tangible shape, says *The Chicago Journal of Commerce*. This company, which was recently organised in Chicago for the reduction of aluminium from native clay by Professor J. M. Hirsh's process, is composed of men of means and enterprise, and, it is understood, will soon be ready to enter upon the work for which it was formed. "I will manufacture the metal myself," said the Professor to a *News* reporter; "I can separate it from common clay at a cost of a few cents a pound, by a process entirely different from any now in use." Of course the process is a secret, but evidently one worth knowing, and, besides, a very profitable one. Two five-storey buildings have been leased at the corner of West Twelfth and Rockwell streets, and works on a productive scale, to the amount of about 2,000 lbs. per week, will soon be in operation. A New York mining journal, which attacked the professor's process as a borrowed one, will probably recall its uncalled-for and harsh criticism as soon as the public learns to appreciate the results of his original methods of reducing this remarkable metal, and of cheapening its cost to a degree that will bring it into more general use.

The same journal says that—

The Cowles Electric Smelting and Aluminium Company, of Cleveland, has, according to *The Chicago Journal of Commerce*, announced that they have reduced the price of aluminium to 1 dol. per lb. Heretofore the lowest price of this metal, as a public quotation, has been 2.50 dols. per lb. in small lots. Five years ago, when the Cowles aluminium was first offered for sale, the current price of the metal was 20 dols. per lb., and little, if any, was obtainable even at that figure, and this without any guarantee of chemical purity. The first price made on the Cowles aluminium was 5 dols. per lb. as against the above figure. At 1 dol. per lb. aluminium will become a sharp competitor with both nickel and tin. At 50 cents pure aluminium would become a formidable competitor with copper. The Cowles Company are amongst the largest manufacturers of aluminium in the world—if, indeed, they are not the very largest—and to their success is due the gradual reduction of its cost. The possibilities of the metal have frequently been discussed, and its high price will not, evidently, be an impediment to its general use much longer.

Business Tact.—Unprepossessing female (to photographer): "How much would you take me for?" Photographer: "About sixteen, madam." He got the job.—*Texas Siftings.*

CLOUDS IN BROMIDE PICTURES.

BY GEORGE WHEELER.

An old saw says, "For want of a shoe the horse was lost." We may supplement this by saying, "For want of a sky the picture was lost." Without any sky, or an atmosphere, or something to indicate that the space above the horizon is not an empty void, the representation of a landscape is only half a picture, and therefore incomplete. Unfortunately, this condition applies to many of our photographic productions.

It is comparatively easy to print clouds in silver prints, and Mr. Wade has already dealt with the subject in a masterly style in his paper on "Combination Printing;" but to adapt the same method to bromide printing entails considerable trouble, waste of time, and an abundance of spoiled prints before a satisfactory result is obtained. To overcome the difficulty, I have adopted the plan of painting a sky on the back of the negative, and find that a good variety of effects can be obtained, and in a very short space of time. The examples which I have placed before you will give some idea of the improvement over blank or white-washed skies which has been effected.

Negatives, to be suitable for bromide printing, should be developed with rather thin skies, so that when the exposure is made the light will penetrate the film, and produce a tone in the sky. To obtain a thin sky on a negative, use less pyro and bromide than usual in the developer, and let the fixing be thorough.

Natural skies, taken at the same time as the views, must, of necessity, be preferable to painted or any other skies. These true copies of nature should be made to reveal themselves, if possible, either by an extra exposure to that part of the negative containing them, or by strengthening with paint.

To paint clouds is not a difficult operation, but it needs to be done judiciously, and with some idea of representing natural appearances; it will not be sufficient to put a few dabs of colour here and there. Observation of the forms which the sky assumes, supported by experiment and perseverance, will soon overcome any difficulty.

Paint the clouds on the back of the negative, which, along with the brush, should be held upside down while the operation is being performed. This will cause the colour to flow towards the top of the clouds, where the highest lights are required, and the point of the brush will form the sharpest edges where they should appear. The unusual position of holding the brush will be soon acquired.

Use "Payne's grey" colour, which can be got from almost any artists' colourman. It is a natural, semi-transparent water-colour, and only obstructs the light by its density, and not by its colour. Do not use reds or other non-actinic colours, as they tend to a crude result. Take very little water in the brush, with a small quantity of colour, and apply it with a free touch, always commencing at the bottom and working upwards towards the landscape. Do not cover the sky with a mass of forms; a few outlines, top and side of clouds only, carefully introduced, will prove the most effective in first attempts. When the colour has dried, breathe upon it, and, with the ball of the second finger, go over the irregular lines of colour along the edges nearest the picture, patting and shaping it so as to soften it away to nothing. The finger end will be found to be an admirable working tool. When necessary, additional colour may be added, but, as has been already hinted, do not overwhelm the sky, or the effect may be unreal; rather aim at a suggestion or indication as a relief from the flat tone which would otherwise appear.

The aerial perspective must be preserved, or, in other words, the clouds must not appear as a map or a wall in front of the eye. The perspective formed by the objects on the land demands its counterpart above, and, just as foreground objects are treated by the artist in a bold style, with strong contrasts, so the highest clouds, which are always nearest to us, and stand in the same relation as a foreground, must be made the most prominent. As the clouds approach the horizon, little more than the lower edges are seen, and these gradually assume streaky horizontal lines, with the darkest shades at their base, and fade away in the distance.

The well-defined masses of cumulus clouds usually have their highest lights at the top and on the sides facing the sun. Sometimes they are simply margin-lit—a form which readily adapts itself to pictures, and is easily introduced.

The side lighting must be correct with the lighting of the view. It would never do to have the landscape lit up from one side and the clouds from the other.

Nimbus, cirrus, and other forms and effects may be afterwards attempted, but should be left until experience has been gained.

To obtain soft edges to the clouds, the negative must be held diagonally to the light, and kept revolving during the exposure.—*The Photographic Record*, Manchester.

Wood-Engraving. — Wood-engraving is no longer to be taught in the Art Schools of the Cooper Union, of New York. The authorities base their decision in this matter upon the fact that, except for such as have special genius, wood-cutting is no longer a remunerative profession, on account of the universal introduction of photo-engraving and kindred processes. Although warm advocates of process-work in general, we are inclined to think the authorities in this case are a little premature. Wood-engraving has a field of its own, and skilled workers will be able to find work for some years to come, unless we are greatly mistaken.—*Wilson's Photographic Magazine.*

Gum Arabic.—Professor Leo Liebermann communicates to *The Chemiker Zeitung* a paper on the examination of gum arabic, in the course of which he states that both Senegal and Cordofan gums should dissolve completely in luke-warm water, whereas cherry-gum only partially dissolves, or, at the best, swells up in the water. When the solution is treated with large excess of potash solution and copper sulphate, warmed slightly (not boiled) and filtered, the filtrate and the precipitate may be reserved for examination. The filtrate will contain dextrine if any has been present in the sample, and, on boiling it, the characteristic brick red precipitate of cuprous oxide will be formed should that be so. The precipitate formed by the Fehling's solution, in the first instance, gives the data for conclusions regarding the nature of the gum proper. After washing with distilled water, dissolve in dilute hydrochloric acid, and precipitate with a large excess of alcohol. Allow the precipitate half a day or day to settle, collect it, dissolve in water, and again precipitate with alkali and copper, purifying with hydrochloric acid and water as before. If the sample is pure gum arabic, it is noticed that the precipitate thrown down by alcohol gathers into one lump, and a little of it dissolved in water and boiled with solution of potash gives an amber-coloured solution. The gum senegal precipitates, and it gives no colour, or only a straw colour, when boiled with alkali; but if the precipitate does not agglomerate, and gives an amber colour with alkali, the sample is a mixture of gum arabic and gum senegal. It is also noticeable that the blue copper precipitate formed on adding alkali and copper to the watery solutions of the gums, is more abundant in the case of tree gum arabic than in the case of gum senegal—indeed, in the latter case the precipitate is not at all abundant.

Notes.

The great rise in the price of platinum is likely enough to check the rate of increase of the production of photographs in platinum. Nearly the whole supply of the metal comes from Russia, in which country the Government takes possession of all the platinum found within its dominions, and afterwards sells it to the world at what price it pleases. The original source of supply was the Brazils, but little comes now from South America. Before its value was known, natives and others, while prospecting the banks of rivers for gold and silver, were disgusted when they found pieces of platinum in place of the latter metal, and when they found them would usually throw them into the river. The first workers of platinum were South American Indians; they hammered some of the rarer large pieces into sacred vessels which were used in their temples. Search should be made for platinum in Australia, South Africa, and other English colonies, for it is a metal likely to be overlooked by first explorers, who are not always the most educated class of men. Photographers in the colonies might do well to get their various daily newspapers to draw attention to the existing demand for platinum and its abnormally high price.

At the close of the season just over, the returning travelling public felt the benefit of the removal of the severe system of Custom House examination of baggage, which had been in vogue in Great Britain for several years previously, because of the dynamite scare. For some weeks past passengers with hand-baggage only have been allowed to land at Dover without much notice being taken of themselves and their belongings by the revenue officers. Between Brussels and Dover there are two competing routes, one *via* Ostend, and the other *via* France through Calais. The effect of this is, that the French Custom House officers at the Belgian frontier near Tournai pay little attention to the baggage of passengers coming to England, provided they show their through tickets on demand.

Several inventors are in the field attempting to increase the rapidity by which photographs printed by light can be turned out by the supplementary aid of suitable machinery. The Donaldson Rapid Photographic Co., of 12, Vesey Street, New York, is said to be printing photographs at the rate of about five hundred copies per hour each machine, from a roll of endless paper. Sunlight or a strong arc lamp is used for printing, and the photographs come out at the end of the machine, cut, dried, and ready for mounting. The method is stated to be entirely automatic from first to last.

In *Le Moniteur de la Photographie*, Dr. T. L. Phipson calls the attention of French readers to the out-of-focus "school" of photographers of this country. He says that its advocates want to do for landscape photography what Mrs. Cameron has done for portrait photography, that is to say, to produce pleasing and artistic pictures something like those produced by the crayon of an accomplished draughtsman. Dr. Phipson says that the *Moniteur de la Photographie* was the first to applaud the efforts of Mrs. Cameron and the Viscountess Hawarden, "whose happy essays have never been surpassed in artistic taste, and very rarely equalled."

The lantern season now commencing is sure to see a greatly extended use of compressed gas. Setting aside the time occupied, and the trouble and risk in making oxygen, which it obviates, it insures to the user a pure gas—free, that is, from chlorine—which plays such tricks with the brass fittings of both lantern and bag. This admixture of chlorine is a fruitful source of annoyance when home-made gas is employed. The smell, too, of the impurity is far too pungent to be agreeable, and sticks to the india-rubber bag with marvellous persistency. We have had such a bag (empty, of course) with us on more than one occasion in a railway carriage, not having been disposed to consign it to the tender mercies of a porter, and each traveller, on entering that carriage, has looked round, and given an audible sniff. It is very difficult, under such circumstances, to sit still and look as if you knew nothing about it. The remedy—a bit of caustic soda put into the wash-bottle—is obvious, but caustic soda is not always at hand when wanted.

There is no doubt that the use of a couple of cylinders—one for oxygen, and the other for hydrogen—presents other advantages in saving bulk and weight, for neither bags, pressure-boards, nor weights are needed. But there are some people who will do what they can to put difficulties in their own way. We heard of an amateur lanternist the other day who had purchased two cylinders, which, in order to ensure safety, were painted the one red, and the other black. This, we need hardly point out, is now the universal rule. But our amateur friend could not get over the fancied incongruity of the different tints, so he carefully painted both cylinders sky blue. He then wrote to the makers to ask them how he was to distinguish "t'other from which." The best answer to his question would perhaps be that which is recorded of an eminent chemist with reference to the best way of detecting ammonia: "The best test," said he, "is the *nose*."

The metal aluminum is now becoming common for lens mounts and camera fittings, and, as it daily gets cheaper in price, its use will most surely extend. Perhaps the best and most extensive application of the metal is to be seen in the fittings of the famous hot baths at Bath. In each bath-room here the pipes, nozzles, jets, and other arrangements are all of silvery aluminum, and these fittings are all exposed to view as if the metal were far too precious to be hidden in the walls. And it was precious at the time these works were carried out—now about ten years ago—for improved methods of manufacture had not then cheapened it. Its price was then as stiff as the clay from which it is popularly supposed that the metal is won.

It seems a pity that no agreement is come to as to the way in which this metal is named. Our American cousins invariably spell it *aluminium*, but in this country we generally drop the second *i*. There is not much difference in the appearance of the two words when printed, but a great difference in their sound. We notice that "Chambers' Etymological Dictionary" gives both words, but places the one with the extra letter in a secondary place. Of course, if the word alum had not already been appropriated, it would do well for the metal. Aluminum is better, we think, than aluminium, which seems to have first grown into use as a trade-mark for certain imitation gold articles. Its adaptation to the purpose is probably the result of accident or ignorance, for the snowy white metal is as different from gold in appearance as is chalk from cheese.

Enthusiasm in a photographer is a desirable and commendable thing, but it is only right it should be tempered by discretion. For the lack of the last-named virtue Mr. John Davies, a builder's foreman, has been fined £18 2s. 6d. It happened in this wise. He was anxious to get a good photograph of a certain public house in Kingston, for reasons which, we may suppose, were not wholly unconnected with the licensing sessions, but found that a satisfactory view of the premises was rendered difficult, if not impossible, because of a certain tree which stood in front. It was nothing to Mr. Davies that the tree was considered an ornament to the locality. He attacked it with all the ardour of Mr. Gladstone himself, and lopped off as many of the obnoxious branches as interposed between the house and the camera. Unfortunately, the magistrates could not see the matter in the same light as Mr. Davies, and the result was that they imposed the fine mentioned above. We should like to sympathise with Mr. Davies, but we must confess we are inclined to side with the magistrates.

The movements of the runner, the boxer, the fencer, are of great interest to the physiologist. In this respect instantaneous photography fulfils a distinct mission, as not only the play of the muscles, but even the working of the nervous system, so far as concerns the period of time between volition and action, can, by its assistance, be watched. Some interesting studies have been made recently by M. Marey of the attitudes of fencing, and the rapid changes from one position to the other have been the subject of a series of photographs. The straight thrust of the fencer is deemed the most important. It is executed with such rapidity that neither the one who gives it nor the one who receives it can define either its exact passage through space, or the length of time taken. Here, however, comes in the value of M. Marey's photo-chronographic apparatus. The fencer is placed before the black screen, and his foil whitened with chalk and wax applied to the point. The apparatus, with its rotatory disc, is set in motion, the fencer makes the thrust, and an image of the sword in its passage is secured. As two successive pictures are separated by a period represented by the fiftieth part of a second, the time occupied by the thrust can be easily calculated. In the reproduction of the photograph given in *La Nature*, nineteen separate movements or pictures can be counted; it follows that the thrust occupied $\frac{1}{50}$ of a second.

The photograph which illustrates this curious calculation not only indicates the speed and the sinuosity of the passage taken by the thrust, but shows the simultaneous movements of the extension of the right arm and left leg. M. Georges Demeny, Preparateur de la Station Physiologique, who writes the paper on this interesting subject, says that two fencers may thus be compared in relation to their speed, and the most adroit be awarded the palm. As this is a record-breaking age, we may expect fencers to enter the lists, and vie with each other as to who can make the swiftest sword thrust. The minute fractions involved are, perhaps, a drawback; nor does it sound well, as has been suggested, if the novelist of the future who wishes to be accurate writes, "Our hero's sword flashed, and to thrust it into his antagonist's breast was but the work of four-tenths of a second." But we may get used to these things.

The copyright question is just now occupying a good deal of attention on the Continent, and, from the activity displayed, we may expect before long to see some definite propositions put before the various governments for acceptance. We learn that the French Minister for Foreign Affairs, acting on a desire expressed by the Russian Government, has asked the Syndicate in France for the Protection of Literary and Artistic Rights for any details which it may be able to furnish of infringements of authors' or artists' rights which have taken place since 1861, when a convention was concluded between the two countries. The Syndicate has, in consequence, addressed itself to authors, painters, sculptors, engravers, and photographers, and requested their assistance to enable it to satisfy this demand. A similar request has also been made to the various societies which the Syndicate represents.

The fog of Tuesday week must have been a sore disappointment to hosts of photographers. They had come out, professional and amateur, almost in their thousands, to secure mementoes of the funeral cortege of the Salvation Army, but we are afraid that the results were failures. One enterprising photographer erected a stand in the cemetery with the idea of obtaining a picture of the funeral service, and we read that "through the mist the cameras of photographers could be made out on all hands. The photographers were on house tops and peeping over walls, and most of them commanded a good view of the temporary platform upon which the service was to be held." This seems very suggestive of photographic energy; the odd thing is that rarely is any result evident. Who are these active photographers, and what do they do with the pictures which, we may presume, they take?

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

ALTHOUGH there is a close general agreement between the experimental results and the numbers calculated by means of the equations, yet in individual cases there are discrepancies. Diagram No. 9 shows the theoretical curves in full lines, the actual observations being indicated by dots. This diagram leaves little doubt that the action of the light on the sensitive film is fairly represented by our equation, and, consequently, it may be assumed as proved that the action of the light at any moment is proportional to the amount of light absorbed by unaltered silver bromide.

Nevertheless, we felt that more experimental proof was wanted to support our equation, which represents the resulting density as a function of the opacity of the unexposed plate to blue light. When it is remembered that the density of the unexposed plate is proportional to the silver bromide spread over its area, it will be perceived that this statement means, in fact, that the density of the

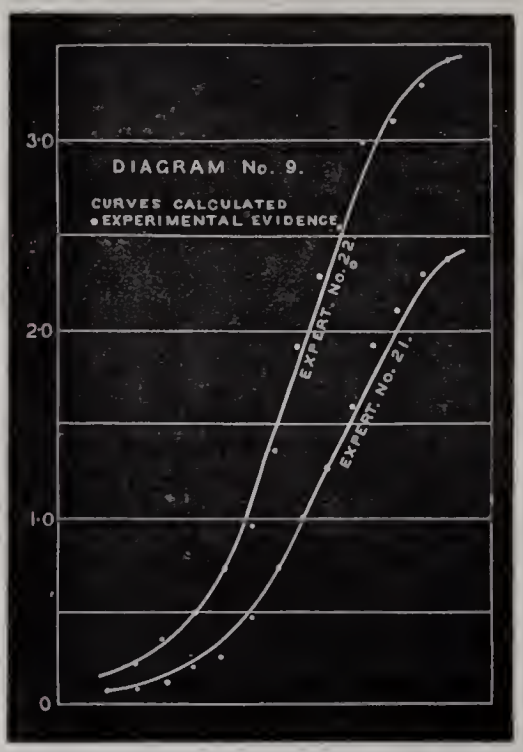


image depends upon the amount of silver on the plate in some way, and this is almost a self-evident proposition.

We prepared sensitive plates of different opacities by spreading on equal areas different amounts of silver bromide. These plates were measured to ascertain their opacity to blue light, and the following results obtained:—

Plates No. I.	Amount of Silver Bromide per 100 Sq. C.M.	Opacity to Blue Light.
	Grms.	
1	0·016	1·738
2	0·031	3·00
3	0·062	10·0
4	0·124	83·0

By means of these opacities four curves were calculated, which are represented in diagram No. 10. To ascertain whether the relative distances between those curves were true, points in each curve belonging to the same exposure (or abscissa) had to be determined in at least two different positions. For this purpose four plates, one of each opacity, were simultaneously exposed, and two different exposures were given of 30 and 240 C.M.S. respectively. The plates were then developed, and the ratios of the densities were taken alone for comparison.

The following results were thus obtained:—

Exposure.	Plate I.	Plate II.	Plate III.	Plate IV.
	Density.	Density.	Density.	Density.
30 C.M.S.	·065	·095	·260	·272
240 C.M.S.	·120	·275	·700	·852
Ratio	1·84	2·89	2·69	3·31

The ratios which are obtained for the theoretical densities, calculated by the equation (2), are the following ones:—

—	Plate I.	Plate II.	Plate III.	Plate IV.
Ratio	1·70	2·50	2·83	3·22

It will be seen that the theoretical ratios agree as well with the observed ratios as could possibly be expected from so difficult an experiment. In diagram No. 10 the relative distances of the curves, as calculated from the ratios obtained by the experiment, are marked by dots.

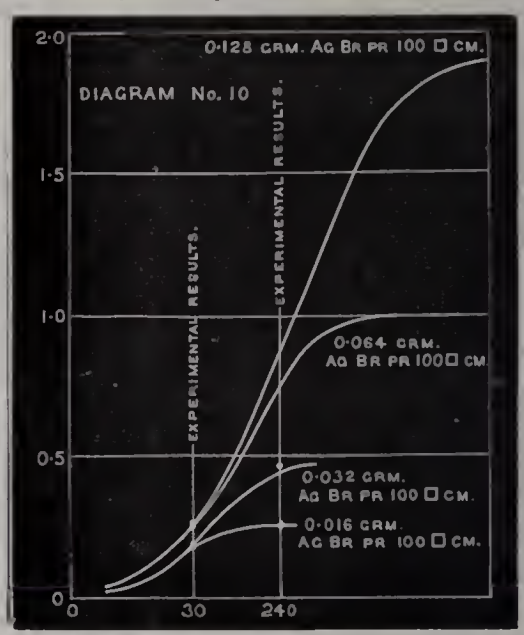


Diagram No. 10 is worthy of some remarks. It will be at once perceived that the more thinly the plates are coated, the shorter is that portion of the curve which is a straight line. This means that the period of correct representation is very short, and great contrasts cannot be truly rendered by a thinly-coated plate. It will also be found, on closer inspection, that the centre of the straight portion is, in each curve, in a different place, and that the thinner the plate, the shorter is the exposure necessary to reach the centre portion. This means that a thinly-coated plate is somewhat faster than a thickly-coated one, though they are made of the same emulsion. A thinly-covered plate, however, appears very much faster than it is in reality. It is incapable of rendering wide contrasts, and hence the negative always looks flat, and thereby gives to the eye the impression of over-exposure.

We have now learnt the great influence which the opacity of the unexposed plate has on the density of the resultant image, and we must now point out a most important source of error in photographic experiments such as we have described. If a plate be not perfectly evenly

* Continued from page 810.

coated, the densities, after development, arising from equal exposures will be different on different parts of that plate. We give here an example of a plate, not a bad one either, on which, in different parts, different exposures were given. The table shows the densities which the same exposure produced on the one half and on the other half of the plate:—

Exposure.	I.	II.	Ratio.
	Density.	Density.	
10	·275	·240	1·14
20	·535	·480	1·12
40	·825	·775	1·06
80	1·185	1·080	1·10

The errors on this plate amount to from 6 to 14 per cent., owing to unequal thickness of the film. It is needless to say that in the dark room, in ruby light, such differences in the thickness of the film cannot be observed. The only remedy for this is to use only very thickly coated plates. We may here say that for our most important experimental work we used slow plates specially prepared for us by Mr. Chapman, of Manchester, every care being taken to secure a thick and even film.

Thickly-coated plates give also very much greater latitude in exposure. The plates used in experiments 21 and 22 would have given good pictures of subjects with contrasts varying from 1:80, though the exposures had varied from 1:2, so that an exposure of ten seconds or one of twenty would have resulted in but little difference in the negatives, excepting that the one would have been much slower in printing, because generally denser. Thinly-coated plates, on the other hand, need very accurately-timed exposures.

(To be continued.)

ON THE DIFFUSION OF FOCUS.*

BY N. E. DUNER.

The distance of the luminous point, between C and D, which is represented by a point, and consequently unaffected by diffusion, is—

$$D = \frac{2D}{1 + \frac{D}{D_1}} \quad \ldots \quad \ldots \quad \ldots \quad \text{(IX.)}$$

or, putting D_1 infinitely great,

$$D = 2D \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(X.)}$$

$$x : d = p - F : p\,;\; x = \frac{d\,(p - F)}{p} = d\left(1 - \frac{F}{p}\right)$$

$$\frac{1}{f} = \frac{1}{D} + \frac{1}{p} = \frac{1}{D_1} + \frac{1}{F} \quad \text{whence}$$

$$\frac{1}{p} = \frac{1}{D_1} - \frac{1}{D} + \frac{1}{F} = \frac{DF - D_1F + DD_1}{FDD_1}$$

$$p = \frac{FDD_1}{DD_1 + DF - D_1F}$$

$$\frac{1}{F} = \frac{1}{f} - \frac{1}{D_1} = \frac{D_1 - f}{D_1 f}\,;\; F = \frac{D_1 f}{D_1 - f}$$

Introducing the value of p in the expression for x.

$$x = d\left(1 - \frac{DF - D_1F + DD_1}{DD_1}\right) =$$

$$d\left(\frac{DD_1 - DF + D_1F - DD_1}{DD_1}\right)$$

$$x = \frac{d\,F}{DD_1} \cdot (D_1 - D) \quad \text{Introduce the value of F.}$$

$$x = \frac{d\,(D_1 - D)}{DD_1} \cdot \frac{D_1 f}{D_1 - f} = \frac{df}{D} \cdot \frac{D_1 - D}{D_1 - f}$$

$$\left.\begin{aligned} x &= \frac{df}{D} \cdot \frac{1 - \frac{D}{D_1}}{1 - \frac{f}{D_1}} \\ d &= x \cdot \frac{D}{f} \cdot \frac{1 - \frac{f}{D_1}}{1 - \frac{D}{D_1}} \end{aligned}\right\} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(I.)}$$

$$y : d = p - F : F\,;\; y = d\left(\frac{p}{F} - 1\right)$$

$$y = d\left(\frac{DD_1}{DD_1 + DF - D_1F} - 1\right) = \frac{d\,F\,(D_1 - D)}{DD_1 - F\,(D_1 - D)}$$

$$y = d \cdot \frac{D_1 F}{D_1 - F\,(D_1 - D)} = \frac{df(D_1 - D)}{DD_1 - Df - D_1 f + Df} = \frac{df(D_1 - D)}{(D - f)\,D_1}$$

$$\left.\begin{aligned} y &= d \cdot \frac{f}{D - f} \cdot \left(1 - \frac{D}{D_1}\right) \\ d &= y \cdot \frac{D - f}{f} \cdot \frac{1}{1 - \frac{D}{D_1}} \end{aligned}\right\} \quad \ldots \quad \ldots \quad \ldots \quad \text{(II.)}$$

$s : p = 2 : y\,;\; p - s : p = 2 : x$ Consequently,

$$sy = xp - xs \qquad s = p \cdot \frac{x}{x + y} \quad \text{But we have also,}$$

$$z = y \cdot \frac{s}{p} \quad \text{then} \quad z = \frac{xy}{x + y} = \frac{1}{\frac{1}{x} + \frac{1}{y}}$$

$$z = \frac{\frac{1}{f}}{\frac{D}{df} \cdot \frac{1 - \frac{D_1}{D}}{1 - \frac{D}{D_1}} + \frac{D - f}{df} \cdot \frac{1}{1 - \frac{D}{D_1}}} = \frac{df\left(1 - \frac{D}{D_1}\right)}{D - \frac{Df}{D_1} + D - f} =$$

$$\frac{df\left(1 - \frac{D}{D_1}\right)}{2D - f\left(1 + \frac{D}{D_1}\right)}$$

$$s = \frac{df}{2D - f} \cdot \frac{1 - \frac{D}{D_1}}{1 - \frac{f}{2D - f} \cdot \frac{D}{D_1}}\,;$$

$$d = z \cdot \frac{2D - f}{f} \cdot \frac{1 - \frac{Df}{D_1(2D - f)}}{1 - \frac{D}{D_1}} \quad \ldots \quad \ldots \quad \ldots \quad \text{(III.)}$$

$$s : F = z : d \qquad s = F\,\frac{z}{d}$$

$$\Delta = F + s = F\left(1 + \frac{z}{d}\right) = \frac{D_1 f}{D_1 - f}$$

$$\left[1 + \frac{f}{2D - f} \cdot \frac{1 - \frac{D}{D_1}}{1 - \frac{Df}{D_1(2D - f)}}\right]$$

$$\Delta = \frac{D_1 f}{D_1 - f}\left[1 + \frac{f\left(1 - \frac{D}{D_1}\right)}{2D - f - f\,\frac{D}{D_1}}\right] =$$

* Concluded from page 802.

$$\frac{D_1 f}{D_1 - f}\left[\frac{2D - f - f\,\frac{D}{D_1} + f - f\,\frac{D}{D_1}}{2D - f - f\,.\,\frac{D}{D_1}}\right] =$$

$$\frac{D_1 f}{D_1 - f}\,.\;2D\left(1 - \frac{f}{D_1}\right) : \left(2D - f - f\,\frac{D}{D_1}\right)$$

$$\Delta = \frac{f}{1 - \frac{f}{D_1}}\left[1 - \frac{f}{D_1}\right] : \frac{1}{1 - \frac{f}{2D} - \frac{f}{2D_1}} =$$

$$1 - \frac{f}{\frac{f}{2D} - \frac{f}{2D_1}} = \frac{2Df}{2D - f - \frac{2Df}{2D_1}} =$$

$$f\,.\,\frac{2D - f - \frac{Df}{D_1} + f + \frac{Df}{D_1}}{2D - f - \frac{Df}{D_1}}$$

$$\Delta = f\left[1 + \frac{f + \frac{Df}{D_1}}{2D - f = \frac{Df}{D_1}}\right] =$$

$$f\left[1 + \frac{f\left(1 + \frac{D}{D_1}\right)}{2D - f\left(1 + \frac{D}{D_1}\right)}\right] \quad \ldots \quad \ldots \quad \text{(VII.)}$$

$$\frac{1}{f} = \frac{1}{\Delta} + \frac{1}{Do}\;;\quad \frac{1}{Do} = \frac{1}{f} - \frac{1}{\Delta} =$$

$$\frac{1}{f} - \frac{1}{f}\,.\,\frac{1}{\frac{1 + f\left(1 + \frac{D}{D_1}\right)}{2D - f\left(1 + \frac{D}{D_1}\right)}}$$

$$\frac{1}{Do} = \frac{1}{f}\left[1 + \frac{f\left(1 + \frac{D}{D_1}\right)}{2D - f\left(1 + \frac{D}{D_1}\right)} - 1\right]$$

$$: \left[1 + \frac{f\left(1 + \frac{D}{D_1}\right)}{2D - f\left(1 + \frac{D}{D_1}\right)}\right]$$

$$Do = f\left[1 + \frac{2D - f\left(1 + \frac{D}{D_1}\right)}{f\left(1 + \frac{D}{D_1}\right)}\right]$$

$$Do = f\left[\frac{f\left(1 + \frac{D}{D_1}\right) + 2D - f\left(1 + \frac{D}{D_1}\right)}{f\left(1 + \frac{D}{D_1}\right)}\right]$$

$$Do = \frac{2D}{1 + \frac{D}{D_1}} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(IX.)}$$

Photographers' Benevolent Association.—At a meeting on the 17th inst. (Mr. W. Benham in the chair), two applications for assistance were granted, and Messrs. Lott, H. Chapman, H. G. Parry, H. Francis, W. J. Tabrum, A. E. Dean, G. W. Pember, and F. Dudman were elected members.

Photographic Society of Great Britain.—Technical meeting on Tuesday, October 28th, at the Exhibition, 5A, Pall Mall East, at 7·30 p.m., when the whole of the apparatus will be shown and explained. At the lantern show on Monday, October 27th, the "Field Club" will exhibit its slides.

REPORT OF THE PROGRESS OF PHOTOGRAPHY DURING THE YEAR CLOSING AUGUST, 1890.*

BY W. H. H. CLARK.

Photographic Optics.—While there have been some improvements in lenses and lens mounts, which are no doubt of great importance, much yet remains of accomplishment before the maximum of our desires is reached. In lens mounts, aluminium, or aluminum, appears to be the coming metal, owing to its great strength and extreme lightness; also its freedom from tarnishing. The announcement was recently made of the invention of a lens that will be in focus for any and all distances, the same as the human eye. I am not, however, prepared to state this as an accomplished fact. As perfect as our lenses are, their full powers are not always understood, or brought into requisition by those using them. Often this is occasioned by a too short operating room. The lens in use cannot be removed a proper distance from the subject, hence an exaggerated perspective; and here I will quote Dr. Vogel in "Anthony's International Annual for 1888," which may prove of value to the progressive artist photographer. The doctor says:—"Artists place their models always higher than they stand themselves. Photographers, on the contrary, do the reverse, that is, the former is generally in a higher position than the sitting person. Photographers give for this an optical reason; with full opening of the objective, face and hands can be brought out with more sharpness in a sitting position if the apparatus inclines towards the front. But we should not be forced any more to this necessity. With the use of our present highly sensitive dry plates, and the application of smaller diaphragms, we ought to be able, particularly with the application of our improved cameras, to obtain hands and face sharp without inclining the apparatus. It is, therefore, a question whether it is not time now to adopt the arrangements of the artists."

Electricity is coming more and more to the front, and being brought more and more into intimate connection with photography. We have it now for lighting our studios, also the subject to be photographed, for printing by enlargement, for heating the burnisher, and furnishing power to operate the same; but the subtle fluid, so little known and understood by man, is destined to play a far more important part in connection with photography in the very near future. Balloon and kite photography, now successfully accomplished, would not be possible without its aid.

Photographic applications to the Sciences become more varied and numerous each year. Without doubt the most astonishing results in all of the sciences have been produced in astronomy by the aid of photography. *Ad astera per aspera.* To the stars through difficulties.

A photographic marvel is, after an exposure of thirty-three minutes, the same instrument which renders visible to the human eye stars of the fourteenth magnitude, which in the entire heavens would register about 44,000,000 of stars, shows to the photographic eye 134,000,000, and on an exposure of one hour and twenty minutes would throw before the astonished gaze of the beholder a luminous dust of 400,000,000 stars. Never before in the history of humanity has man possessed the power of penetrating so profoundly into the depths of the infinite. Photographs of the star Mizar, in the handle of the Big Dipper, show that star to be double, or that there are two suns too

* Continued from p. 812.

close to be distinctly separated by any telescope, and it was noted that on certain occasions the lines in the spectrum of Mizar were double. After continued photographing, it was found that the lines were doubled once in fifty-two days. The star Menkalina, the second in magnitude of the constellation Auriga, has also been found by photography to be double. I have received from Mr. S. W. Burnham, of the Lick Observatory in California, some beautiful examples of photographs of the Milky Way, the Corona during a total eclipse of the sun, and other celestial bodies, as photographed through the great Lick telescope. In this connection it will be interesting to show the progress of astronomical photography, by quoting from a report on "Celestial Photographs," by E. E. Barnard, M.A.:—"Two negatives were made of the great nebula of *Andromeda*, with exposures of 3h. 15m. and 4h. 18m. Throughout these exposures, as in the other cases, the eye was kept constantly fixed on a star bisected by cross wires in the eye-piece, and the clock controlled by the slow-motion rods. Both negatives clearly show the dark spaces and the nebulous rings that were first shown to exist by Mr. Roberts in his exquisite photographs of this nebula. The rings of nebulosity are seen at a glance, though the image on my negatives is on a small scale, the full extent of the nebula covering one inch. I tried to see these with both the 12-inch and the 6½-inch, but without success, though the so-called "canals" on the north side are clearly seen in both instruments. In studying the distribution of the stars in space and the structure of the Milky Way, it is clear that any legitimate means of exaggerating peculiarities, or, rather, of bringing them out more strikingly, is greatly to be desired. It would appear that the best way to do this is to photograph large areas of the sky so as to include enough material. If, now, we reduce this to a small scale, relations that would otherwise escape the eye are brought prominently forward. Acting upon this idea, I have made reduced copies of the above negatives. The result is striking. In the Milky Way pictures the cloud-like masses of stars stand out more boldly, and their forms are more definite than in the original. Reduced in this way, the picture of the region of the *Andromeda* nebula is singularly beautiful; and it shows in a most remarkable manner the peculiar structure of that part of the heavens. The intricate arrangements of the stars in rings and segments are thus shown as nothing else can show them. Previous to these experiments, at Professor Holden's suggestion, I had attempted to photograph the Milky Way with a 1-inch (9 inches focus) Voightlander lens mounted on the 12-inch and the 6½-inch telescopes at different times. These exposures—running up to an hour and a half—showed absolutely no trace of the cloud-forms that are so striking to the eye. The plates were, however, literally sprinkled with stars, most of which were beyond the reach of the eye alone, and therefore much less bright than the Milky Way itself. The sensitive plate was not deceived by a quantity of light as the eye was; but, as its action depends upon the intensity of the light, it had gone to work systematically to pick out the individual stellar points of the Milky Way. Of course, we know, if it had had time enough, it would have finally begun the impression of the luminous groundwork. Nothing could show more beautifully the difference between intensity and quantity in the action of light upon the sensitive plate than these attempts to photograph the Milky Way." The great Lick telescope is now supplemented by a remarkable piece of mechanism—an eyepiece which has just been completed—outrivalling anything of the kind before made. The largest before in use was not over two inches in diameter, while the new piece measures over three inches. The light from the heavenly bodies seen through the Lick telescope and this new eyepiece will be two thousand times as bright as that seen with the naked eye. With the increased powers of the new telescope now in process of construction for the University of Southern California, we may look for still greater advance in stellar photography. Mr. Alvin G. Clark, probably the most famous optician in the world to-day, has received the glass for the 40-inch objective, and which weighs over two tons. For the sum of $108,000 he agrees to make the telescope complete, visually and photographically. When it is remembered that with the Lick 36-inch glass the moon is brought within about 100 miles of the earth, with this new power in the hands of the astronomer we may expect to be able to produce better photographs than heretofore of our satellite.

(*To be continued.*)

THE CAMERA AND ITS VARIOUS MOTIONS.

BY PROFESSOR W. K. BURTON.

Introductory.

From the cameras of the time of Daguerre—of which we learn that the whole wooden sliding-box that constituted the arrangement had to be removed to the dark room for the insertion of the plate, the exact position of the camera on a kind of table being first marked—to the most modern forms of landscape cameras, with double swing-backs, double-action sliding fronts, revolving front, revolving base-board, and heaven knows what not all, what a stride there is!

Indeed, the complications of the modern camera have become such that there are those who say that some of them are worse than useless, and that they would prefer to have cameras lacking many of the most modern improvements.

In this matter I incline in part, at least, to agree. In the most complicated of modern cameras there are many motions, some of which come into use so very seldom that the complication arising from their presence rather detracts from the general usefulness of the camera than otherwise. Still, it must be admitted that every motion—so far as I know—that has been added even to the most complicated, has at least some occasional use, and that it must be a matter of opinion as to what extent the "game is worth the candle," or, to be plain, at what point the advantage of further motions is more than counterbalanced by the disadvantage of the additional complication.

One thing is quite certain: every motion that a camera has that is not thoroughly understood by the user, is a disadvantage rather than the reverse. As I have seen many amateurs struggling with cameras in which the various complications were evidently impediments instead of useful additions, I venture to think that a few short papers describing, as concisely as possible, the various motions in a modern landscape camera, may be useful to some readers. What I have to say will be chiefly, or perhaps I should say entirely, addressed to amateurs, and for that reason will refer almost entirely to the landscape camera. Of the various forms of landscape cameras in use in England I think I may say that, from the old-

fashioned sliding wooden box camera with which I took my first negative, to the most modern of cameras—a brilliant mass of polished mahogany and brass—I have either actually worked, or helped in the working, of nearly every one; I should, perhaps, except the genus "detective camera." Its name is truly legion, and I doubt if any human being could boast that he has used every variety that is offered in the open market.

(*To be continued.*)

A FEW HINTS AND DEVICES.

BY F. M. GILES, M.B., F.R.C.S.

The few notes that are offered below do not pretend to be in any way original, but are mostly plans suggested in photographic periodicals which have stood the test of trial.

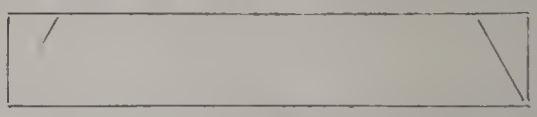
1. *Apparatus for Developing.*—No doubt the plan to be described has often been used by photographers who, like myself, are accustomed to work at volumetric analysis; but I do not remember seeing it suggested anywhere. Everyone knows the spilling, delay, and annoyance involved in measuring out solutions by means of measure glasses in the chastened light of the dark room, all of which may be avoided, together with the attendant staining of the fingers, by the plan described below.

Procure three burettes, holding about 25 c.c. each, and graduated to either the metric or English system, as preferred; three short pieces of rubber tube, 2½ inches long, to fit the burettes; three glass jets for ditto; and three pinch-cocks. Place the three burettes, duly fitted up, in the holders of a burette or retort stand. Prepare three labels of black, non-actinic paper, as large as can conveniently be affixed to the burettes, and mark with a brush dipped in scarlet vermilion water-colour a large A on one, B on the other, and S on the third, the letters being made thick and as large as possible; when dry, give each a dab of varnish to prevent their washing off. Now fill A with alkaline solution—saturated solution of carbonate of soda is what I prefer; B with ten per cent. solution of bromide of ammonia; and S with sulpho-pyrogallol—the letter S being used instead of P for pyro because the latter is too like a B to be a safe sign to use in the dark room. The quantities required for the development of each plate can now be measured off on the graduation of the burettes with the greatest quickness and ease.

There is no need to empty the burettes after use provided each be furnished with a well-fitting cork, which is only removed during actual use; the fluids would, of course, not run with the corks *in situ*. The first drop or two of the sulpho-pyrogallol may be discoloured if many hours have elapsed since use, but not more, and, in this case, should be rejected; but the waste from this source is insignificant.

The whole apparatus can be got at a very small cost from any of the large chemists' stores in the Presidency towns, but can be easily made up at home from glass tubing by the aid of a big spirit lamp. About four feet of soft English tubing, ⅜ internal bore, are required for the burettes, and about a foot of ¼-inch soft tubing for the jets. They can be graduated by gumming a very narrow strip of black paper along one side, measuring the contents of a given number of inches by means of a measure glass, then marking the divisions in bold lines in vermilion, and finally varnishing. A burette stand, too, can be easily knocked up out of a few pieces of wood, the tubes being pinched into notches in a horizontal bar by a lath held against it by rubber correspondence bands, notches and lath being alike guarded with wash-leather.

2. *Developing Trays, Cheap and Self-Cleansing.*—Most of our members are acquainted, no doubt, with that very useful water-proof material, Willesden paper. It forms by far the best material for developing trays I have met with. The trays are made by cutting out a square 2½ inches larger each way than the required size of plate, and folding up the sides in the way children make a paper box. The corners are secured by a few stitches along the edge, the finished tray presenting the appearance as below. Now paint with a brush dipped in vermilion in



very large, bold letters, in the middle of the bottom in the inside, a word indicating its future use, such as pyro, oxalate, toning, hypo, &c. Next, melt in a beaker or an old jam tin some solid paraffin, about 125° melting point; a paraffin candle will do, or, if paraffin cannot be procured, use an ozokerite candle, or even the stearine of a common or domestic composite. Heat this up so that the temperature of the fluid is well above the melting point—nearly boiling, in fact. Place your paper tray on a piece of window glass, and pour into it the whole of the contents of the beaker. Tilt the glass quickly to all four sides so as to wet the sides up to the edge, and then pour back into the beaker, doing all as smartly as you can. When in use, the trays are held on a slip of window glass an inch larger each way than the size in use. They have many advantages over any other form of tray, of which the following are the most important:—

First.—They require no cleaning, as, when emptied, the water runs off them as it does off a duck's back, so that they become quite dry instantly. As the fluids never adhere, pollution of one solution by another becomes impossible, even if the same tray be used for several purposes.

Secondly.—The weight of the contained fluid presses them down on to the piece of glass on which they are held, so as to obtain a perfectly flat surface, so that less solution is required than with any other tray. It is easy to develop a whole-plate film with six drachms of solution.

Thirdly.—Besides being very cheap, they are so portable that half-a-gross would scarce weigh as much as a single porcelain tray. For camp work nothing is so suitable as half-a-dozen of these trays, carefully made so as to "nest," and packed in a japanned tin case open along one side, so as to form a deep, narrow tank, and provided with a tin or brass spout near the bottom, on to which is slipped half a yard of rubber tubing fitted with a pinch-cock. The outer case then serves as a water-tank when developing.—*The Journal of the Photographic Society of India.*

Those who use straps in connection with the cases of photographic apparatus may be interested to know that in Geneva newly-invented buckles are on sale which look like ordinary buckles, but can be locked after fixing the strap.

Impertinence of Photographers.—Mr. Blimber (alarmed)—"My dear, what is the matter?" Mrs. Blimber (sobbing)—"That insulting old photographer sent back word with my crayon: 'The original of this portrait is carefully preserved.' The hateful thing!"—*Detroit Free Press.*

Patent Intelligence.

Specifications Published.

12,375. *August 7th*, 1890.—"A Substitute for Bone or Celluloid." William Marshall Campbell Callender, 101, Leadenhall Street, London, Engineer.

This invention relates to the manufacture of a new material designed to serve as a substitute for bone or celluloid, and which I term "Lactite."

The "Lactite" is produced by reducing casein (or the solids in milk) to a partly soluble or gelatinous condition, by means of borax, or ammonia, or by other suitable means, and then mixing it with a mineral salt dissolved in acid or water or acid and water, which liquid is subsequently evaporated.

In carrying out the invention, I advantageously place ten kilogrammes of casein in a vessel, and incorporate it under heat with three kilogrammes of borax previously dissolved in six litres of water. When the appearance of the casein becomes changed I draw off the water, and the residue will then be of a consistency somewhat resembling melted gelatine, and while in this state I add one kilogramme of a mineral salt held in solution by three litres of acid. Almost any of the salts of iron, lead, tin, zinc, copper, or other mineral salts which are soluble in acid may be used. The acid employed depends upon the salt used, as only such acid should be used as will properly dissolve the salt. The salt employed depends upon the exact colour required in the finished material. In practice I have obtained good results by the use of acetate of lead and acetic acid. The solution of the mineral salt in acid must be thoroughly incorporated with the previous mixture of casein and borax; this is a matter of some difficulty, but can be accomplished in a mechanical mixer. When the mixture is effected the solid matter will be found separated from the greater portion of the acid and water, which should now be drawn off. The solid matter should be subjected to great pressure to drive out all possible moisture, and any moisture which may remain should be evaporated under great heat, or by other suitable means, the resulting product being the new material. The new material may either be supplied in the form of sheets or rods, or moulded in any form desired, and it can be coloured, as required, either by the admixture of pigments or by aniline or other dyes.

The cost of the material may be lessened by the admixture of a certain proportion of other substances, such as precipitated lime or chalk, or other similar substances soluble either in the acids, in the casein, or in the borax and water.

Instead of rendering the casein soluble or gelatinous by means of borax, I may effect the same result by the use of ammonia, or by any other suitable means.

The combination of the materials can be effected in many ways, and I do not bind myself to the precise details above described, or to any exact process of manufacture or proportions of the different ingredients used in such manufacture, as these can be varied according to the exact use for which the "Lactite" is intended; for general purposes, however, I find satisfactory results from the above described process, proportions, and ingredients, and they will sufficiently illustrate the subject of my invention.

What I claim is:—

1. The manufacture of a new material designed to serve as a substitute for bone or celluloid by reducing casein into a partly soluble or gelatinous state by mixing it with borax, or ammonia, or by other suitable means, then combining the mixture with a mineral salt dissolved in acid, the free acid being subsequently evaporated, substantially as hereinbefore described.

2. In manufacturing the material as described in claim 1, the admixture of other subtances for the purpose hereinbefore described.

3. In the manufacture of the material described in claim 1, the use, instead of acid for dissolving the mineral salt, of water or of water in combination with acid.

4. The new material designed to serve as a substitute for bone or celluloid, substantially as hereinbefore described.

16,492. *October 18th*, 1889.—"Washing Trough for Prints." Percy Ellis, The Manor House, Wallington, Surrey, Gentleman.

This invention has for its object the construction of a trough for washing photographic prints, photographic negatives, and the like, which shall be simple in construction, and shall automatically empty itself when filled or nearly filled with water or liquid.

The trough is shaped or formed as follows:—

Three of its sides and the bottom are rectangularly disposed with respect to each other. The fourth side is joined to and inclined upwards from the bottom of the trough, and outwards or away from the side to which it is opposite, thus leaving an angular space between the inclined or fourth side and the surface on which the bottom of the trough rests. Two of the three sides of the trough which, as already mentioned, are rectangularly disposed with respect to each other, are prolonged so as to join the inclined or fourth side. Thus it will be seen that a side elevation of the trough would be a figure formed of a rectangle joined to a right-angled triangle, the hypothenuse of the latter forming the fourth side of the trough, and one of the sides of the right angle being continuous with the top of the trough.

The trough is weighted at that side or part opposite to the inclined or fourth side in such manner as to cause it to stand upright or on its bottom when empty or partly filled, and also to allow it to automatically turn over and empty itself when the trough is nearly or entirely filled or the height of the water has exceeded a certain limit. When the water has been emptied to the requisite amount the weight will cause the trough to return to its normal position with its bottom on the surface on which the trough rests.

I provide the trough with a false bottom, which may be removable if desired, upon which I place the photographic prints to be washed when the trough is to be utilised for this purpose; and I fix a wire or other reticulated partition to the trough at the middle or other part of the fourth side, to prevent the photographic prints from being washed away when the trough empties itself.

When the trough is to be utilised for washing photographic negatives, the negatives are inserted in a holder and the holder placed in the trough. The latter may be provided with supports for bearing the said holder.

By the construction of trough above described, which automatically empties itself, I am enabled to dispense with the siphon arrangements used for that purpose.

Bedford and District Camera Club.—At the meeting on Tuesday, October 25th, a paper will be given by Mr. D. Beaman on the "Making of Stereoscopic Negatives."

Developing Dishes.—Messrs. Samuel Fry & Co. have sent us a dish with wooden sides and a glass bottom in which to develop lantern plates. A projecting pin prevents the plate from resting flatly on the glass bottom, and enables it easily to be raised for removal. Developing dishes with bottoms of ordinary sheet glass, and with sides of paraffined wood, are, when well made, likely to become popular, especially with those who use glass-platformed rocking tables, and wish to examine plates in the developer by transmitted light.

A Sulphocarbide of Platinum.—At a recent meeting of the Paris Academy of Sciences, a paper was read on "A Sulphocarbide of Platinum," by M. P. Schutzenberger. By passing a current of dry nitrogen charged with the vapour of carbon bisulphide over spongy platinum contained in a glass tube heated to about 400° C., the carbon bisulphide was entirely absorbed, and the platinum converted into a finely-divided black powder. An examination of the product showed that it had the composition Pt_2S_2C. The powder is very dense, and appears entirely homogeneous when microscopically examined. Neither hydrochloric nor nitric acid have any action upon it, and even with *aqua regia* there is very little action. When heated to redness in dry oxygen the powder burns, with the formation of carbon dioxide, and sulphur monoxide and dioxide, leaving a residue of pure platinum.

Correspondence.

MR. LYDDELL SAWYER'S PICTURES AT THE CAMERA CLUB.

Sir,—Mr. Lyddell Sawyer's reply to the critique of his pictures now at the Camera Club was not conceived in an unkiudly spirit, and I should not have thought it necessary to make any reply, but that there are one or two assumptious in his letter which do injustice to the cause of naturalism.

Mr. Sawyer assumes that uaturalism does not admit of any arrauging and posing. This is certainly not the case. Naturalism forbids the use of means aud the application of principles which must of necessity introduce artificiality and waut of harmony ; but it certainly does not condemn "arranging and posing." It is where puerile subjects have been treated, and badly treated, that naturalism takes offence at Mr. Sawyer's productions.

Mr. Sawyer also makes capital out of a false assumption that his critics are not aware that the figures in "Waiting for the Boats" and "On their own Hooks" are arranged. The fact is, these photographs are liked because the figures are *naturally* arranged in their proper and fitting characters and occupations.

The astonishing refereuce to pure landscape art as "the insignificant proceeding of pilfering pictures of nature's sole production" may be allowed to work its own confutation in every sensible person's miud.

Mr. Sawyer is improving in this letter. A little severity with himself will soon render hostile criticism unnecessary.

October 20th. X.

SPHERICAL ABERRATION AND DEPTH OF FOCUS.

Sir,—Absence from town has delayed my notice of Mr. Debenham's article on the above subject in your issue of the 19th ult., aud I regret that it is necessary to further trespass upon your space, for, although a record of Mr. Debenham's views, it must not go unchallenged in its statements auent the subject under discussiou. First, to history. I have for reference the *British Journal of Photography* aud the *Photographic News* of 1867. Iu the former: "Mr. Debenham said he proposed to show that the effect of introducing spherical aberration, as advocated by Mr. Dallmeyer and others, was to eularge the circle of confusion at all points anywhere near the focus of a lens, and at no part of the path of light to diminish it." Then follows au explanation dealing with transversal measurements that I have exploded.

In the *Photographic News* Mr. Dallmeyer's reply was: "In relation to as much as he could understand of Mr. Debenham's remarks, he seemed *to have overlooked the fact entirely* that the effective power of the rays was *altogether altered* by the diffusion of focus. He might easily satisfy himself, however, by reference to practical illustrations, when he would find that by such diffusion objects in planes wide apart were better defined, not simply relatively, but absolutely."

The last five words brought about the commeuts from the late Mr. Grubb and the comparative diagrams. Mr. Grubb's diagram compared lenses of unequal foci, and was erroueous in calling the least circle of aberration that of best focus, as I showed in a properly disposed diagram, in this respect, in my recent paper. (I fouud Mr. Grubb's diagram somewhat indistinct, and purposely favoured it in the direction of a more correct disposal to avoid any hair-splitting.)

Mr. Debenham now comes in with astounding statements from a practical photographer of many years' experience, and a discovery (save the mark) of a "phase of the case against spherical aberration that has not, I think, as yet been enforced"!

The apex of the axial coue of rays leaving the lens, as I have previously shown, is the best focus, and Mr. Debenham *still tries to controvert* it. Let Mr. Debenham first have corroboration of this froun Monckhoven's optics ; second, let him take a wide-angle landscape lens—that is, without spherical aberratiou up to about F/15—aud focus carefully ; then open out the aperture for excessive positive spherical aberration, and see if the plane of best focus alters. Then take a patent portrait combination well unscrewed, and get his best focus, and see how much stopping dowu by diaphragms to remove it alters the plane of best focus.

The view of the case taken practically is, that there is a more or less considerable available aperture for perfect coucentration, and when this is overstepped, and aberration is introduced, the iuterference is distributed along the axis towards the lens, and weakens the effective defiuition of that portiou of the lens available for an aplauatic focus.

The uselessness of Mr. Debenham's "new aspect" is due to his entire neglect of the value and dispositiou in image formation of the interferiug spherical aberration *after the limit for aplanatism is passed*. Wheu this limit of area is passed, every increment of aperture has a different focus on the axis towards the lens, any given measureable zone having no focus at all, but throws, in its projection, halos around the originally distinct iuage. Every astronomer knows that the test for spherical aberration is the observation that the image lingers partially distinct beyond the best focus, and vanishes more rapidly inside the focus.

The practical test Mr. Debenham refers to (as having been characterized by me as au unfair one) is the best I could recommend, and he could not have made himself clear on the occasion referred to. I fail to find it recorded, but recommend Mr. Debeham to carefully repeat it, as *his* experience is unique.

The final paragraph of Mr. Debenham's article is quite in keeping with the rest of his "record" iu controversy with me. It speaks too openly for itself for me to waste time in commenting on it. For reply, and the inference to be drawn, I quote my own paper* :—"The subject chosen is oue of powerful contrast, aud in the image Plate XII. appears worse defined than Plate V., although the structure in Plate XIV. is, as it should be, better than Plate VII. The visual image of Plate XII. was distinctly better than that of Plate V., but the halo due to the spherical aberration appears to have worked in to the black ground, in the chemical actiou very much more than appeared visually. *In development of these plates I had the kind assistance of Mr. Victor Corbould, and chiefly in the plates where spherical aberration was present, but in fact in all cases the primary appearances in development were far truer to the visual ones than at the conclusion of development.* The other plates that I think will be particularly interesting is the process of transition to reversal of the black and white squares of the object in Plates XVII. and XVIII. ; on the other side of the focus, however, the structure is maintained by the image forming rays through very wide limits."

The experiments were checked and verified by Mr. V. Corbould throughout, and we remarked that the original negatives would have been of far more value to illustrate such a subject than the priuts hurriedly prepared in *collotype*.

In your last issue your correspondent shows again a one-sided view of the optical aspect of naturalistic focussiug. He eutirely ignores the aspect of *binocular vision* enunciated by Dr. Emerson, and sounehow forgets, in what he does write, to give credit to Mr. Dennis Taylor for having been the first to publish the important aspect referred to, which is of itself optically correct for *monocular* vision. A wordy war is useless, and I decline to continue it. The facts of the case are before those of your readers who are interested in both the theoretical and practical uses of the introduction of spherical aberration.

25, *Newman Street*, W. Thos. R. Dallmeyer.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

Sir,—As I find myself placed in a false position at the Photographic Society's Exhibition—a medal haviug been awarded me, and now withdrawn on account of my having infringed the rules—I trust you will grant me space to make the following statement.

In the first place, I had no idea of exhibiting at Pall Mall this year, and should not have sent, but that, incidentally meeting the hanging committee at the restaurant where I lunch, they particularly requested me to do so. I promised

* The *Journal of the Camera Club* for March, 1890.

to see if I could find something, and the same day I sent an enlargement—a life-size single figure—which, in the hurry, I quite forgot had been exhibited at the Draper's Hall last season. This picture, on delivery, was recognised, refused, and brought back.

For several succeeding days I met the committee at the same place, and one day I spoke to Mr. Cocking, the secretary, and expressed to him my regret at the mistake, and told him that I had nothing else I cared to send which had not been exhibited at the Crystal Palace or in the city, upon which he told me, in a friendly aside, that he did not think there would be any objection to the Palace, it being so nearly out of the postal district, but that anything shown in the city was out of the question; and he again urged me to send something that day, as, though the hanging was practically finished, he could yet find room if my pictures were not large. Two small photographs were accordingly sent that evening.

I hope that this will show that I acted in perfect good faith. With regard to the medal system, I should like to say something, but will leave that for another letter. H. Vanderweyde.

182, *Regent Street*, W., *October 21st*.

Proceedings of Societies.

The Camera Club.

On Thursday evening, last week, at a meeting of the Camera Club, Mr. Wilson Noble, M.P., presided.

Mr. A. Maskell exhibited a Claude de Lorraine mirror, which, he said, was not a thing easy to procure in England. It was a convex black mirror, of glass, and used to judge values, an important point in photography, because on a bright, sunshiny day it lowers the tone of the view to something like the tone of Claude Lorraine paintings. He also exhibited a plate of metal of French make, with pinholes of definitely measured apertures, any one of which could be used at will, according to the size of plate to be exposed; the apertures varied in diameter from about $\frac{1}{100}$ to $\frac{1}{20}$ of an inch.

Mr. T. Charters White stated that he had exhibited a Claude de Lorraine mirror at the Photographic Convention at Birmingham; it was useful because it gave everything in neutral colours. He thought that a blue ground-glass focussing screen would be better than a white one, because it would give everything in neutral colours.

The Chairman said that a larger pinhole than used in photography was of value in the first instance, to let the operator know easily how much of the view his plate was taking in.

Mr. Lyonel Clark then spoke of some additional experiments of his own in toning with the salts of certain noble metals, and gave some demonstrations. He preferred to use Arnold's pure paper in photographic printing. He minutely described his methods of salting and sensitising rough plain papers. As a colloid vehicle he now prefers gelatine to starch and leaves out organic salts except when extra vigour is required in the prints. His gelatine solution is a strong one, and sets into a jelly when cold; he applies it at a temperature of from 120° F. to 130° F. For the intensification of silver prints he still employed the intensifier used for negatives in the collodion days—namely, water, acetic acid, and small proportions of pyrogallol and nitrate of silver. He, like Captain Pizzighelli, had failed in his attempts to tone silver prints with iridium; the salt he had tried for the purpose was the sesquichloride of iridium and potassium, procured from Messrs. Hopkin and Williams. With palladium toning there was a great loss of intensity on the immersion of the print, and a colour produced which looked greenish by daylight; the intensity was next brought back by the pyro-silver intensifier. The palladium toning could then be repeated if desired, followed by another intensification, and so on, until any desired depth was obtained. The palladium toning bath was an acid one, and it had a tendency to yellow the paper; the price of palladium was objectionable. He believed the prints to be more permanent than those on albumenised paper.

Next Thursday will be a lantern evening. The meetings of the Camera Club now begin at 8.30 p.m.

London and Provincial Photographic Association.

October 16th.—A paper was read by Mr. G. W. Atkins on "Stereoscopic Photography" (see page 820).

A discussion followed as to the cause of the decline of this branch of photography. It was generally conceded by the members present that the introduction of vulgar, or so-called comic slides had much to do with this.

Mr. W. E. Debenham was more inclined to the opinion that it was due to the "carte" mania. He illustrated by means of the black board the theory of stereoscopic vision, and also described the telestereoscope. By a little practice objects could be viewed stereoscopically without the aid of the stereoscope. One method was by looking a long way off; a slide is interposed at arm's length, and gradually brought nearer until the effect is obtained; or put two coins near together on the table, take a piece of card and hold it between the eyes, then gradually separate the coins until they superimpose.

A question was asked, of what use was the centre partition in the stereoscope?

A Member replied that without it three images would be seen.

Mr. Atkins showed how stereoscopic prints were mounted to obtain the best effect.

Mr. A. L. Henderson, who was unable to be present, sent to the meeting a number of stereo slides and two stereoscopes.

Mr. T. E. Freshwater also brought a series of slides.

The exhibits were viewed with a great deal of interest.

Mr. W. A. Casson was elected a member of the Association.

South London Photographic Society.

At a meeting held on the 17th instant at Hanover Hall, Rye Lane, Mr. Leon Warnerke was elected an honorary member, and was voted to the chair.

The president (Mr. F. W. Edwards) demonstrated the capabilities of alpha paper.

Mr. Warnerke said that some six years ago he produced a large number of prints on chloride paper; one of these, which he handed round for inspection, was in as good a state of preservation as when first produced.

Three members were elected, and eight names proposed.

West London Photographic Society.

At the adjourned annual meeting on October 17th (Mr. C. Bilton in the chair), the following officers were elected for the ensuing year:—*President*—Mr. Walter Adam Brown; *Vice-Presidents*—Messrs. C. Bilton, G. F. Blackmore, Walter L. Colls, and Dr. F. H. Low; *Council*—Messrs. England, Horton, Richardson, Scanlan, and Whiting; *Hon. Sec.*—J. A. Hodges; *Assistant Hon. Sec.*—Mr. L. C. Bennett; *Hon. Treas.*—Mr. W. H. Whitear; *Hon. Librarian*—Mr. J. Wilson; *Hon. Lanternist*—Mr. R. Horton; *Hon. Auditors*—Messrs. H. and L. Selby.

A general discussion then took place relative to the drawing up of the syllabus, in the course of which Mr. Whiting expressed the opinion that it would be advantageous to hold technical meetings more frequently than hitherto.

Mr. Miller thought that instead of negatives and prints being handed round promiscuously, it would be better if some one qualified took the exhibits and demonstrated their merits or faults.

Mr. Whiting thought that a technical meeting would effect the objects aimed at, because at such meetings members could bring forward novelties or avail themselves of the opportunity of having their difficulties solved.

Mr. Hodges considered that the success of a technical meeting depended very much upon the members themselves. If the objects in view were supported by a larger number of exhibits, a good practical result would be assured.

Mr. Lamley, in a letter, suggested that in order to avoid prints becoming damaged, and to give everyone an opportunity of inspecting them, a drawing board covered with grey cloth should be provided, to which the prints might be attached with drawing pins—which met the approval of the meeting.

Messrs. Rogers, J. C. Adams, and F. Adams were unanimously elected members. Mr. W. Schooling, F.R.A.S., was nominated for election.

The next meeting, on the 24th October, will be a lantern night.

NORTH MIDDLESEX PHOTOGRAPHIC CLUB.

October 13th.—Mr. RODGERS gave a lecture on "Pictures of Egyptain Life," and illustrated the same by the optical lantern. He first showed the apparatus by which the pictures, afterwards exhibited upon the screen, were taken; this was a Shew's camera, quarter-plate, fitted with Eastman's roll holder and celluloid film.

He then gave an accouut of the places visited by him, also of the manners, dress, customs, and method of living of the people.

On October 27th Mr. Bishop will give a lecture on "Stereoscopic Photography."

NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE seventh annual meetiug was held iu the Society's rooms, Cavendish Chambers, Market Street, on October 20th; Mr. S. WELLS occupied the chair.

The HON. SECRETARY presented the annual report, which was passed.

The meeting endorsed the aetion of the committee in giving notice to vacate the present rooms and endeavour to meet with more suitable premises. A motion that the subscription be one guinea per annum was also agreed to.

The officers were then elected for the ensuing year:—*President*—Mr. S. Wells; *Vice-Presidents*—Messrs. G. E. Williamson and E. Smith; *Hon. Treasurer*—Mr. B. Sturges Dodd; *Hon. Secretary*—Mr. P. E. Knight; *Committee*—Messrs. R. S. Armitage, W. Burrows, T. Carnell, F. Hodgson, J. C. Lancaster, J. Furley Lewis, A. Pickard, T. S. Piggin, J. Spray, W. Towers, and M. Tuquet.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

ON the 14th inst. a meeting was held in the Mosley Street Café, Newcastle, Mr. J. P. GIBSON in the chair.

The subject of "Halation and Backiug Plates" was opened by the chairman, who said that he had not seen reason to change the opiniou that black paper smeared over with glycerine and squeezed into contact with the plate, was the easiest, and at the same time a practical method of avoiding halation. In extreme cases he would pin his faith to the method of Mr. J. Hedley Robinson—viz., drop black mixed in gum-water aud alcohol.

Mr. AUTY recommended black paper ready gummed, which only required to be damped with a sponge and then put on the plate.

Messrs. J. Brown and Edgar G. Lee both expressed their preference for a solution of bitumen in benzole, on account of its immediately drying, and they usually postponed its removal until after fixation of the plate, a scratch of a finger across the back being sufficient to show how the negative is as to density.

DERBY PHOTOGRAPHIC SOCIETY.

A MEETING was held at Smith's Restaurant, Victoria Street, Derby, on the 14th inst.; Dr. GREEN presided. The election of officers for the year 1891 was proceeded with, and resulted as follows:—*President*—Captain Abney, R.E., &c.; *Vice-Presidents*—Dr. Green, Richard Keene, and T. Scotton; *Committee*—C. B. Keene, C. Bourdin, W. Hart, A. H. Bennett, R. Woods, and R. L. Warham; *Secretary*—C. J. Chadwick; *Treasurer*—A. B. Hamilton.

After the business was transacted, a fine collection of slides was exhibited by the maker, Mr. Warham, who was accorded a most cordial vote of thanks for the treat he had given.

THE PHOTOGRAPHIC CLUB.—October 29th, Lantern Slide Competition, first lanteru night of the season; November 5th, Annual General Meeting.

Answers to Correspondents.

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

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

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

B. N.—*Kallitype Process.* Supplementing the information we gave you last week, it ought to have been stated that the developed prints are not immediately washed with water, but are first treated with acid and alkaline clearing solutions. These are—

I.—The developer	¼	oz.
Nitric acid	20	drops
Water	1	pint.

followed by two successive baths made as under—

Ammonia	2	drms.
Citrate of soda	1	drm.
Water	1	quart

and finally washed in plaiu water.

EXPERIMENTER.—*Are Amylic Compounds Hurtful?* Fusel oil (amylic alcohol) has an irritating action on the lungs, provoking cough, and amylic acetate has a similar property in less degree. The latter is, however, largely employed in confectionery for making pear drops. Methylic alcohol (wood spirit) has an uupleasant smell, but is not harmful.

J. W. (Leeds).—*Reducing Bromide Prints.* 1. The chloride of lime method is so potent that it is difficult to restrain it within moderate bounds. A much better process is to immerse in a weak hypo rendered just yellow, or a fuller tint, with potassium ferricyanide (red prussiate). This answers excellently well also for reducing over-intensity in negatives. 2. Three lessons ought to be sufficient.

B. C.—*Pinhole Apertures.* Instead of trusting to a single layer of tin foil, you may employ several thicknesses, or perforate a more substantial piece of the rolled metal, inserting this in the place of your diaphragm, with the lenses, of course, removed.

A. M. M.—*Woodburytypes with Clear Margin.* Upon testing, with oil and hot water, the print which formed the frontispiece of the YEAR-BOOK for 1889, we come to the conclusion that the print in question is a veritable Woodburytype. We conceive it possible, with a highly resisting paper, and covering the central picture with a guard under pressure, to clear off the superfluous margin by sponging with hot water. We know of no method of providing for the escape of the excess of gelatinous ink in the event of the plate being thickened at the edges, and so would rather infer that it has been removed subsequently.

W. L. (Java).—*Furnell's Adjustable Shutter.* You are mistaken in supposing that the figure 4 in the time arrangement is intended to represent four seconds. As a matter of fact, aud in confirmation of your own experience, we find that 4 actually corresponds to *ten seconds*, so that you have only to construct for yourself a time-table founded upon actual observatiou with your instrument and a good watch.

A. W., G. R. B., and others are referred to the advertisement columns for information respecting the supply of primuline materials and likewise of sensitised silk.

HEREFORD is thauked for his explanatory letter relative to Watkins' exposure meter, and for the intimation that it will be shown and described next Tuesday at the technical meeting of the Parent Society.

L. P.—The gentleman named in your letter is a member of the Photographic Society—date of election, 1881. His name is printed in the last published list, that of February, 1889.

NOTICE.—The musical and lantern soirée of the Photographers' Benevolent Association will be held this evening at Anderton's Hotel, Fleet Street.

D. J. S.—Received your negative showing three poses by triple exposure. The result is fairly good, but would be improved by fixing short partitions in the camera, reaching about half way.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1678.—*October* 31, 1890.

CONTENTS.

WARM GLASS STUDIOS FOR THE WINTER.

HEAT rapidly escapes through glass windows, and more coal has to be burnt in the fire-place or stove to make up for this loss. Over a considerable portion of Europe the houscholders are wiser in their day and generation than we are in England; there are some portions of Europe in which double windows are the rule, and not the exeeption; in some parts of Switzerland even the agricultural labourers have double windows to their eottages. In the space between the inner and the outer window, flowers or plants are eommonly grown in the miniature greenhouse, and they often form an elegant substitute for a curtain. The inner window is usually from a foot to eighteen inches behind the outer window. In the summer-time we have sometimes, at Swiss hotels, utilised the spaee between the two windows by drying negatives therein in the sun, for there they are proteeted from dust from within and without the house. If, in a large hotel restaurant, the inner panes of glass of one of the windows ehance to be broken in frosty weather, nobody will sit at the table nearest that window, beeause it is palpably so much colder there than at other parts of the room. How much more, then, must the ordinary glass studio of a photographer tend to keep eold in the winter?

A remedy whieh may be worth trying is to double the glass part of a studio, so that it shall resemble one glass studio within another, and with a spaee of one or more feet between the two; the layer of still air between the inner and outer glass coatings will do mueh to prevent the loss of heat, and to sustain an interior equable temperature in the winter time. Should the studio have doors opening to the outer air, two doors would have to be provided, with a suitable spaee between them.

Melloni was the first to experimentally test the extent to whieh radiant heat from a partieular souree would pass through glass, and he found glass to be nearly opaque to heat rays from non-luminous sources. It, however, absorbs the heat, becomes warmer, and then itself radiates it in all directions. This faet reveals the philosophy of the glass fire-screen; mueh of the heat of the fire is thereby kept from the face, yet none of it is lost; the screen grows warmer, and radiates its heat to all parts of the room; the heat it receives is distributed in other directions than would have been the ease in its absence.

A model studio for the winter may be imagined, with its glass and other thin parts doubled, leaving a layer of imprisoned air between them to prevent rapid escape of heat. Into a ehamber below the whole of the studio, the outside air might pass through large openings, each covered with three or four layers of coarse eanvas soaked in glyeerine; much of the dirt in the air would stiek to these sheets; the rest of the dirt could be filtered out by passing the air through boxes lightly stuffed with eotton wool. The clean air eould then be warmed with hot water pipes, and afterwards passed through openings in the floor into the studio above. Suitable means should be provided in the roof of the studio for carrying off breathed and impure air. Sueh a studio should be approaehed through a long passage, with swing doors across it at intervals, so that any person entering the studio eould not let in mueh bad air from outside with him There are photographers who may upraise their hands and eyes at these ideas, and speak of the impraeticability of the whole scheme; but, unfortunately for them, the system has been at work for a long course of years in our Houses of Parliament at Westminster, and with additions whieh have not herein been set forth. Some English photographie dry plate makers have arrangements for filtering the air before it enters the eoating rooms.

The only question is one of money; otherwise it is perfeetly practieable for a photographer to provide himself with a glass studio free from fog and dirty air even in the worst days of November, and to keep the studio at a comfortably warm temperature with less consumption of coal and gas than he now finds to be necessary. Any system of artificial ventilation is destroyed by direet openings to the outer air. At the Houses of Parliament are devices for keeping the interior cool during hot days in the summer, and the late Dr. Percy, who had eharge of the ventilation

department, was sometimes irritated by members of Parliament opening the windows of some of the rooms to cool themselves, as they thought, such being the force of habit. As a matter of fact, by opening the windows they were letting in dirty air, hotter than the purified air they had previously been breathing.

COMPRESSED GASES.

The time of year has now approached when the tourist camera is set aside, and when many of those who have laid up a goodly store of negatives during the summer months will be thinking either of reproducing them as lantern slides, or as enlargements. To both kinds of photographic workers, the subject of compressed gases is of interest, for the limelight, in the absence of electricity, is the best illuminant for lantern slide projection, and is, perhaps, the best by which to enlarge one's negative when daylight is not available. And the limelight, nowadays, is best and most conveniently produced by using either one, or both, of its constituent gases in a compressed form.

The first workers with the lime—or Drummond light, as it was then called, after its inventor—had to be content with bladders for their gas-holders, or, perhaps, with some arrangement with inverted washing tubs, which had a faint resemblance to the receptacles for gas which tower above our gas works. Then, when demand justified supply, the familiar wedge-shaped india-rubber bags were introduced, and now these will probably be soon consigned to oblivion in favour of the less cumbrous and more convenient steel cylinders in which various kinds of gas are supplied commercially.

There is no doubt that the too frequent reports of accidents with the limelight deterred several from meddling with it, and those who have been interested in noting these disasters know full well that many occurred which never got into the newspapers. Unless, indeed, an accident had a fatal result, it was hushed up, for those chiefly concerned knew well that publicity would do them no good. Although many disasters occurred by careless admixture of oxygen and hydrogen, the great majority happened during the actual making of the oxygen—sometimes due to gross ignorance or carelessness, and often to the presence of some foreign agent in the chemicals employed. When the gas is bought ready-made, and in a compressed state, this greater part of the risk is altogether obviated, and the limelight is placed upon a safer footing than ever it was before.

Some persons, unfortunately, are so constituted that with them everything is dangerous, and gas and all things inflammable should be put beyond their reach. Their type is well known, and is often exemplified in those newspaper accounts of household explosions which tell how John Smith goes to look for an escape of gas with a lighted candle. To the surprise of nobody but the ill-fated John himself, the chief actor in the drama suddenly finds the room blown inside out, and himself almost in a similarly disrupted state. Last week was such an accident reported, the only peculiar feature of which being that the hero had his skull fractured, a feat which we should have considered to be an anatomical impossibility. The explosion was evidently of unusual violence.

But those who, like photographers, are accustomed to the use of apparatus, the weighing out of chemicals, and other operations which require both thought and delicacy of touch, are not the persons to blow themselves up in this inconsiderate manner, and with the modern conveniences for the production of the limelight they would find it extremely difficult to do so. An explosive mixture, either of hydrogen and air, or of hydrogen and oxygen in certain proportions, is necessary before an explosion can take place, and such mixture is now well guarded against at the compressed gas works by a simple expedient. The oxygen cylinders are painted black, and those for the reception of hydrogen are coloured red, in addition to which the nozzle of one has a left-hand threaded screw. This means that that cylinder, the hydrogen one, can by no possibility be attached to the pumping arrangement which is designed for the oxygen supply. It is therefore out of the power of the most careless workman to fill a hydrogen cylinder with oxygen, or, conversely, one that is painted black with hydrogen.

The supply of these compressed gases has assumed the position of a great industry of late years. This has been partly due to the introduction of cylinders of mild steel in lieu of those which were used at first, and which were made of iron. The new cylinders are tested to stand a pressure of 3,000 pounds to the square inch, but they are issued from the works with a pressure of 1,800 pounds only. But more especially is the new industry due to the success with which oxygen can now be separated from its associate, nitrogen, in the atmosphere by the method perfected by the Messrs. Brin. This bottled oxygen is used for various other purposes besides those which have to do with photography, and the Brin Company are now establishing works in several of our larger cities. At first the great initial pressure of the gas in its cylinder caused some slight difficulty in dealing with it for limelight purposes, but since improved regulators have come into use the objection has vanished. The number of those who employ gases under compression is constantly on the increase.

Steps are being taken in the United States to form a National Association of Amateur Photographers.

Transparencies.—Mr. James Colgrove has exhibited at the Chicago Camera Club some fine transparencies, developed by the following formula, which he said wrought admirably :—

No. 1.

Hydroquinone, eikonogen, potassium, meta-bisulphite, of each	90 grains
Water	16 ounces

No. 2.

Potassium carbonate, sodium carbonate, potassium ferrocyanide, of each ...	1 ounce
Water	16 ounces

To make the developing solution, take water one ounce, No. 1 one ounce, and No. 2 one drachm, more or less according to circumstances.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Photographs of animals are always interesting. *They*, at least, do not pose for their pictures, and one is sure to get nature of some sort. Saving sheep and cattle already mentioned in dealing with the landscapes, animals are but poorly represented. In regard to cattle, by-the-way, Mr. H. P. Robinson's "What is it?" (No. 362) deserves special mention, because the cow with the look of wonder in her eyes, and every muscle rigid with intense curiosity, really is the picture, and makes one forget the landscape. Whether the photograph was the result of accident or design, it is exceedingly happy. Mr. S. R. Brewerton has been fortunate in securing a series of photographs of foxhounds, to which he has given the title of "The Pick of the Pack" (No. 337). The series, however, does not call for extended mention. The couple of pictures (Nos. 347 and 389) by Mr. Gambier Bolton, of kittens, are undoubtedly among the most popular in the Exhibition. To those who know the difficulties, these two successful photographs must represent a score or so of spoiled plates. Mr. Henry Little's picture of Kempton Park (No. 394) illustrates the shortcomings of instantaneous photography when art is in question. It would almost seem as if a horse were one of those subjects best left unphotographed —at least, broadside on. The horse, when photographed in motion, always looks deformed, and Mr. Little's horses are no exception to the rule. Mr. Ernest Spencer has some studies of cats and dogs (No. 414) which have merits, but his "Busybody and her Promising Litter" (No. 383) might have been left unhung with advantage. It must be said that, on the whole, the photographs of animals are disappointing. There is nothing in the Exhibition to touch the work of the famous Posen photographer, whose studies are famous all over Europe.

Of Mr. Walter R. Cassel's two pictures (No. 340, entitled "A Sad Story," and No. 341, "Derwentwater") I prefer the landscape. The composition of "A Sad Story" seems to be faulty. The figure of the girl leaning back in the chair appears to be so far from the one sitting on the ground that the latter may, at first sight, be overlooked. The arrangement of the salient lines is apparently too diffused.

Some of Mr. Shipton's work has already been noticed, but he deserves praise for his bit of woodland scenery and figures (No. 346), and the artistic "The Village under the Cliff" (No. 390). Mr. J. Pattison Gibson's clever series (No. 369 to 376) are full of the right feeling; No. 372, "The Ford," is perhaps the best. Mr. Ernest Spencer's landscapes (Nos. 384 to 387) have a suggestion of muddiness which is unpleasant, while his skies are of the old-fashioned woolly order, which have been so often condemned that it seems strange to find them making their appearance over again. Mr. Dudley Arnott has an excellent interior, "Norwich Cathedral" (No. 413), evidence of very careful work. How "Tired" (No. 417), by Messrs. Adams and Scanlan, came to be admitted into the gallery, is rather puzzling. The idea is puerile, but even were it not, the inartistic treatment would condemn it. The figure of the girl huddled in a chair is what ladies sometimes call a dress "skimping," and there is an air of absurdity about the whole which provokes a smile.

Of course the Exhibition would not be complete without our old friends Burnham Beeches. Mr. C. F. Urquhart is responsible this year for a picture of the much photographed trees, and all that need be said of it is that it is as good as most of its predecessors. Mr. Urquhart also sends a little composition, "Which hand will you have?" (No. 428) which narrowly misses being very good. Mr. Urquhart has, however, like scores of other men who have tried the same line, come to grief over his models, whose expressions do not much assist the story. Mr. J. C. Douglas, in No. 437, has attempted a "Gretchen." It wants colour and feeling, however, and cannot be called a very successful piece of work. The Hon. Slingsby Bethell has given us a sort of puzzle in his view of "The New Forest" (No. 445). The foliage is cut so curiously by the sky that it is distressing to look at. Verily, it is without form and void.

"The Path to the Shore" (No. 444), by Mr. A. Horsley Hinton, is a landscape which very nearly approaches the front rank. It is well conceived and well carried out. Mr. J. Bracebridge Hilditch has, I am inclined to think, exhibited more interesting pictures than in No. 447, "Toilers from Early Morn," and No. 448, "Village of Streatley." They do not repel, but, unfortunately, they do not attract. "A Midsummer Evening" (No. 456), by the Rev. H. B. Hare, is a pleasing picture of rural placidity. Mr. Hare has well named it; the calm of a June evening has been admirably conveyed. Sir David Salomons shows two figure subjects, No. 458, a study of a girl's head, and No. 459, "A Boulogne Fisher Girl." The first might have been better vignetted. The fisher girl is pleasing, though I have my doubts whether her acquaintance with fish is very intimate. She looks like the fisher girl of the studio. Mr. R. H. Lord's "Work and Play" is not remarkable, and it would almost seem as if the word "copyright," which stares at one from the mount, were superfluous. There is a look of the "made" picture which detracts from its merits.

Mr. Lyddell Sawyer's pictures have already been alluded to. I have, however, not mentioned No. 479, "Towing up Stream," where he is seen at his best. It is a very fine picture. "Beating in" (No. 490), by Mr. Ernest Beck, is a clever little marine study.

The reproductions, if scarcely so numerous or remarkable, are, as in former times, excellent. The Autotype Company show a variety of specimens which testify—if testimony were wanting—their care and skill. Messrs. Boussod, Valadon, & Co. have long ago made good their claims to recognition, and some of their work is simply exquisite. I can imagine nothing more pleasing, judged as a mechanical piece of work, than their reproduction of Mr. Fildes' well-known picture, "An Alfresco Toilet" (No. 504). Mr. T. Julius Hurst shows three meritorious copies of oil paintings by Leader, Ansdell, and Erskine Nicol, and among other exhibitors are the Typographic Etching Co. and Mr. Walter L. Colls (reproductions in copper plate).

Photo-micrography is represented by Mr. Andrew Pringle, who shows a frame of microscopic work, chiefly bacteria. Mention is also due to Col. J. Waterhouse, B.S.C., who exhibits an example of photo-etching by his special process recently described. Wide-Angle.

Amateurs and Professionas.—Mr. J. Hubert says: "With regard to the vexed question of amateurs and professionals, there is one thing to be noted, that the partly educated of both classes will always be at war with each other, while the better educated and more intelligent will always endeavour to exercise that courtesy and forbearance in their intercourse which is one of the signs of civilisation."—*The Beacon*, Chicago.

THE CAMERA AND ITS VARIOUS MOTIONS.

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

The Essentials of a Landscape Camera.

It should be Light-tight.—I incline to put this qualification first, although it may not be of greater importance than others. Indeed, in so far as the two or three qualifications to be here dwelt on *are actually essentials*, they must be considered to be of exactly equal importance.

When I say that the camera should be *light-tight*, I mean a great deal more than is commonly meant. Pretty well any photographer, if you ask him, "Is your camera light-light?" will reply, "Oh yes, to be sure!" but if you watch him working, you will see that he keeps his camera covered with an opaque cloth during exposure, only opens the dark slide a few seconds before he takes off the cap, and, in fact, takes every precaution lest light should leak into the camera. In fact, it is very evident that he does not trust the light-tightness of his camera, and it is ten to one that he has never tested it.

Now I do not say that it is not right to take the precautions against the leakage of light into the camera mentioned above, but it certainly ought not to be necessary to take them.

If a camera be bought from any maker, there is, I have no doubt, an "implied guarantee" that it is actually light-tight, and I know that, in the case of any *respectable* maker, if a test show that the camera is *not* light-tight, the said maker will be glad to correct the defect free of charge; that is, assuming the camera to be new. As I shall presently point out, the best of cameras need occasional overhauling.

I think that the first thing that should be done when a camera is bought, is to test it for light-tightness, by putting a plate in a dark slide, placing the camera in full sunshine, drawing the shutter of the slide, and turning the whole gear partly round from time to time. so that all sides may receive the action of the light, for ten minutes or so. The plate, on development, should show no sign of fog. It is a good thing, to facilitate the detection of the action of light, to stretch a strip of opaque paper across the film, so that, if the action of light have been but slight, it may still be made visible by the comparative clearness of the part of the film protected by the paper.

I consider, indeed, that, should the first test show no action of light, it is worth while going through with all the slides full, trying one plate after another. The satisfaction of knowing that the camera and each dark slide is thoroughly to be relied on to keep out light is cheaply bought at the price of two plates per dark slide.

One word in warning. The test recommended is for the *camera*, and it is necessary to make very sure that no light enters by the *lens*. Light certainly will enter by the lens, if it be one with Waterhouse or rotary diaphragms, unless special means be taken to cover the slit. Indeed, if the camera be a new one, it is fairest to the maker to perform the test above described before any opening is cut in the front to take the lens.

Even if a camera prove light-tight when new, it should be tested from time to time, as there is a liability to some change even in the best made cameras through time, at any rate if they receive the rough usage that cameras do at my hands. This is particularly true of *large* cameras, for the difficulty in making cameras light-tight, and in keeping them so, increases greatly with the size.

It would be a good rule to test a camera in the way described at the beginning of every season. I mean at the beginning of each photographic working year.

The Camera should be Rigid.—This is a qualification well recognised, at least by English makers of cameras. Indeed, by far the greater number of cases of want of rigidity at the present may be traced to defect in the tripod stand, or in the manner of fixing the camera to the stand, rather than to actual want of stiffness in the camera itself.

I would point out that there are two entirely different kinds of want of rigidity. One is due to the general lightness of the camera, or ill proportion of parts, resulting in "springing" of something, generally the base-board; another is due to looseness of screws, pins, &c., allowing a certain amount of "shake," or even the chance that some adjustment—say the swing-back—may actually slip after focussing.

The "springing" of cameras is most likely to give rise to a tremulous motion during exposure started by taking off the cap. In fact, there are few cameras that do not show this defect more or less when they are extended to the full extent. In the days of long exposures this want of rigidity was of comparatively little consequence; the camera had time to come to rest whilst the exposure was still only beginning, and the effect was inappreciable. With the exposures common at present, if any tremor is imparted to the camera when the cap is taken off, it generally lasts during the whole exposure, and, indeed, there must be few landscape photographers who have not had experience of images entirely blurred by tremor of the camera started by taking off the cap.

A less common, but by no means uncommon, cause of tremor in the case of cameras that "spring" much is wind.

Another effect that I have known to arise from want of rigidity in the base-board of a camera is, that the weight of a double dark slide has "sprung" the base-board sufficiently to put the image perceptibly out of focus. It is true that this defect is only likely to be found in large cameras, and even then the springing has never, in my experience, been so great that the image was likely to be put perceptibly out of focus with lenses other than those of very large aperture. With a portrait lens used full aperture, however, a movement of $\frac{1}{20}$th of an inch will put the image quite perceptibly out of focus, and I have known cameras of the size of 10 by 8 and upwards that would spring quite enough to increase the distance between the lens and the back to that amount with the additional weight of a loaded double dark slide.

The looseness of joints, pins, or screws, giving rise to what I may call "ricketiness," is often found in cameras of second-rate manufacture, and is liable to be developed in the best of cameras after a time if they be subjected to rough usage. This looseness is not nearly so liable to give rise to tremors as is "spring," but it is very liable to result in a disturbance of adjustment after focussing, particularly in placing the slide in position, an operation which, unfortunately, often needs some force, even in the case of cameras of the very best make—a thing that seems a pity.

There is no way of testing the rigidity of a camera but by fixing it up and trying it by hand; and then it is important to distinguish between want of rigidity due to the camera itself, and that due to the stand. Some knowledge of mechanics and some experience also are necessary to

know whether a camera is likely to *remain* stiff or not after much use.

Lightness and Portability.—Perhaps these qualities should barely be described as *essentials*, inasmuch as photography of the highest class would certainly be possible without them; but a certain amount of portability, as compared with the ancient box-camera, or even with the earliest forms of so-called "portable camera," is really essential to amateur photography as it is now known.

It is in the qualities just mentioned that the most modern cameras chiefly excel, and, indeed, it is wonderful to what feather-weights of lightness, and to what sandwich-like thinness (when folded) have been reduced cameras that are capable of opening to more than twice the length of the plate to be used, and even to be moderately stiff at that.

Concerning lightness and portability, the only thing I incline to say is that, although they are of the highest importance, not a jot of stiffness—or, if desirable, strength—should be sacrificed for the sake of a few ounces of weight, or for a quarter of an inch of thickness of the folded camera. I have no hesitation in saying that some of the very lightest of modern cameras are *too* light to be strong and lasting instruments.

A PHOTOGRAPHIC EXHIBITION AT TUNBRIDGE WELLS.

The Tunbridge Wells Amateur Photographic Association will hold its fourth annual Exhibition at the Sussex Assembly Rooms on Wednesday, Thursday, Friday, and Saturday, November 26th, 27th, 28th, and 29th. The officers of the Association are:—*Patron*—Sir David L. Salomons, Bart.; *President*—Mr. F. G. Smart; *Vice-Presidents*—Rev. A. T. Scott, Mr. J. G. Calway, Rev. J. E. Rogers, Mr. G. Percival Smith; *Hon. Treasurer*—Mr. B. Whitrow; *Hon. Secretary*—Mr. Joseph Chamberlain.

In the Exhibition, the following are the classes for members only:—(1) Architecture, exterior or interior; (2) interiors, other than architectural; (3) landscape; (4) instantaneous, including marine subjects; (5) genre; (6) lantern slides, best series of six, any subject; (7) transparencies; (8) best photograph of trees, without leaf. The following are the open classes:—For amateurs—(9) landscape or seascape; (10) genre; (11) lantern slides, best series of six; (12) architecture, exterior or interior. For professionals—(13) landscape or seascape; (14) genre; (15) lantern slides, best series of six; (16) portraits. The rules of competition may be obtained from Mr. Joseph Chamberlain, hon. sec., 14, Calverley Park Gardens, Tunbridge Wells. The judges are Sir David Salomons, Mr. H. P. Robinson, and Mr. C. W. Hastings. There will be a lantern demonstration each evening, and Sir David will bring his special lantern for the first night, and exhibit it at work.

Enfield Camera Club.—It has been decided, provided sufficient interest is taken in the movement, to hold an exhibition of the work of the members in the Byculiah Athenæum, Enfield, in the early part of January next, at which prizes and certificates will be given for the best photographs in the following classes: architecture, landscape, instantaneous, genre, lantern slides, and portraiture.

Camera Club Notices.—Monday, November 3rd, 8.30 p.m., Smoking Concert; Thursday, November 6th, 8.30 p.m., Mr. J. Gale, "Country Rambles with a Camera Illustrated;" Thursday, November 13th, 8.30 p.m., Demonstration of the Primuline process by Messrs. Green, Cross, and Bevan; Thursday, November 20th, 8.30 p.m., Mr. Andrew Pringle, "On Certain Old Processes for Lantern Slides;" Thursday, November 27th, 8.30. p.m., Lantern Evening; Monday, December 1st, 8.30 p.m., Smoking Concert; Thursday, December 4th, 8.30 p.m., Mr. H. Sturmey, "On Rollable Transparent Films."

THE PHOTOGRAPHIC TOUT.

BY JAMES MEW.

But the unkindest cut of all in this semi-religious and semi-commercial excitement was a cut which affected very seriously the photographic tout. Indeed, on the occasion of the suggestion of that particular cut, he had a very near squeak of it—as the fox-terrier said of the rat when he had bitten off the tip of his tail—for nothing less was proposed than to delete him. This was regarded by some as a measure of strict retaliative equity. He had cut out his rivals, and his rivals were for cutting him out in return. But, notwithstanding much urgent effort and passionate perspiration, the tout, or the doorsman, as he was then contemptuously called, still survived. Even the Association for Sunday Closing, "under distinguished patronage," could not annihilate him. When every respectable photographer inveighed bitterly against his desecration of the Sabbath at Tottenham, he coolly changed his locality, and walked with a cabinet in one hand and a carte-de-visite in the other up and down, like the polar bear in the Zoological Gardens, before his well-known case of photographic specimens at Turnham Green. "Here we are again," we hear him in our mind's ear exclaim, with a smile of satisfaction only inferior to that of the clown in a Christmas pantomime. "Here we are again! Here is our *specialité!*" Why the cognate English word would not have answered his purpose it is no easy problem to discover. Speciality sufficed for Hooker and for Hale, but it can find no favour in the eyes of the photographic tout. Nor is it altogether justified in the eyes of the author of "Slip-shod English in Polite Society," who says, "the British tradesman *will* talk about and advertise his *speciality*, whereas he means *specialty*." But our best dictionaries hold both words to have the same meaning. "Here is our *specialité!* Here is our art gallery! Here our superior finish! Here our best work! Here are our portraits by day and by night! Here are our three cartes-de-visite for half-a-crown, and one carte-de-visite for a shilling! Here are our three cabinets for four and sixpence, and one cabinet for two shillings! Here are our cabinet and carte combined for eighteenpence the pair;" and Sairey Jane and 'Arry in their best Sunday dresses—'Arry with a big flower in his buttonhole, and Sairey Jane with a flaunting red feather in her hat—having nothing better to do on the Christian day of rest, come and bask in the sunshine of his rhetoric, and listen to the words of this charmer, turning no deaf ear, like the adder, to the voice of his persuasion, and in due process of time are "took," and so depart contented with fading caricatures in their pockets, and a lingering look at that portion of the advertisement on the door-post which speaks of portraits "taken on steel and warranted never to fade."

And what has the poor tout to say in his defence? What plea of excuse or avoidance has this photographic sabbath-breaker to urge against his immediate execution? Stoning to death was, if we remember rightly, the Jewish penalty for an offence of this nature against the Sabbatical law. Well, he might say many things. He might say, for instance, in his unregenerate ignorance, that the taking of a photographic picture involves no more toil than the driving of an omnibus or a train, the playing on an instrument of wind or strings, the preparing of a dinner, or the pursuit of a thief. He might say that the majority of his

* Continued from p. 822.

customers have no time at all to have their portraits taken except on Sunday. He might say, with respect to his patter of persuasion, which has been cruelly called his discreditable method of inducing custom, that there are thousands of people who will not purchase goods except under this same pressure of rhetorical influence. It is probable that neither Mrs. Harris nor Mrs. Gamp ever visited the greengrocer's while she could buy a succulent adjunct to her tea from the blatant hawker who fills our humbler streets o' afternoons—aye, and o' Sunday afternoons—with his false but piercing cry of "Fine fresh *spring* watercresses" in the month of September. And in that section of society which is called with some vagueness of description the higher classes, are not the Dowager Lady Dash and the Honourable Mrs. Asterisks often indebted for their ultimate decision of buying two pieces of haberdashery which they do not want, to the gentle persuasion of the linendraper's "pushing" young man, who has descanted in terms of superlative praise on the merits of each of them in turn? And with regard to what has been called his unscrupulous impudence in the recommendation of wares which he knows to be comparatively worthless, may not the tout whisper a word or two about the common condition of commercial morality, and ask, supposing him to be a member of the Christian Young Men's Association, whether those were alone guilty upon whom the tower of Siloam fell? And he might conclude his apology something after the following fashion: My customers will buy their portraits cheap, or they will not buy them at all. They also require urgent solicitations to induce them to purchase. The superior person who does not like me is not obliged to listen to me. I hold him neither by his buttonhole nor, like the ancient mariner, by my glittering eye. He may pass on his way in peace. But to that humbler wight, not blessed with this world's goods, who listens to and eventually employs me, I give, I conceive, his money's worth. I give him, or more frequently her, a picture not, indeed, such as the Virgin Queen is said to have desired, painted without a single shadow—it is urged against me that my pictures are all too full of shadows—nor a portrait with all the little defects of nature smoothed away by the retoucher's pencil, but a portrait painted by the sun, of which the linear accuracy is unapproachable by any painter that ever lived, a portrait which, notwithstanding its many technical defects—which I should be the first to acknowledge, not, indeed, in the open publicity of my portrait saloon before the faces of my customers, but in the private seclusion of my dark room to myself—is without the conventional mannerisms and peculiarities of such famous painters as Lely, and Hoppner, and Gainsborough, and Reynolds, and in that sense truer and better than any work of theirs—a portrait, finally, which is cheap and will bring happiness to many a home of which the means are inadequate to purchase anything more costly. For with these humble livers it is Hobson's choice. It is my portrait, or none at all. And of the benefits conferred by these pictures—poor things as they are at best—what need is there now to speak at large? Like mercy, they are twice blessed, in the pleasure of those that give, and of those that receive them, sent as they often are from parents to children, or from children to parents, across vast continents, to recall the familiar faces of those dear ones who are so many thousands of miles away, and parted from them by so many a land and sea.

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

VI.—Rapidity of Sensitive Plates.

We gave two formulæ as the result of our investigations; one of them, the approximate one, is the direct result of our experimental work; the other is the mathematical expression of the idea that a certain definite amount of energy is needed to bring a particle of silver bromide into the condition in which it can afterwards be developed, and that it is only to the light absorbed by unaltered silver bromide that increase of density consequent on increased exposure is due.

Whilst the approximate formula is never strictly true, and can be used only for exposures which fall within the period of correct representation, it is extremely simple, and we are about to describe an important application of it, viz., the determination of the speed of the sensitive plate.

The more correct formula cannot be used for practical applications owing to its complication, but it serves to indicate the limits within which the approximate formula may safely be used.

In the formula—

$$D = \gamma . \log \left(0 - (0 - 1)\, \beta^{\left(\frac{It}{i}\right)}\right)$$

we may replace $(0 - 1)$ by the symbol 0 when that represents a large number, that is, when the plate is richly coated with silver bromide. If, in addition, we remember that $\log \epsilon \beta$ is $-\frac{1}{0}$, the equation can be transformed into another, viz.:—

$$D = \gamma . \log \left(\frac{It}{i}\right)$$

which equation holds good only when the numerical value of $\frac{It}{i}$ is greater than 1 and less than the opacity 0. It is between these two limits only that this equation gives tolerably correct results. Comparing this last equation with the approximation we gave before, it will be seen that the constant C of that approximate formula is the logarithm of i, the symbol measuring those properties of the film which together constitute its sensitiveness, and which we termed the inertia of the plate.

Supposing we had two richly-coated plates, with different inertias, i and i_1, and we wished to impress the same density upon them by a given intensity of light I. They would require different exposures and the exposures would have to be such that—

$$\frac{It}{i} = \frac{It_1}{i_1}$$

or the times would have to be chosen so that—

$$\frac{t_1}{i_1} = \frac{t_0}{i_0}$$

This means that if the values of i are known for different plates, the exposures required to obtain the same results are also known for those plates, if the exposure is known for any one of them.

The determination of the numerical value of the symbol i is, therefore, an important problem.

Since the density of the image is an abstract number, it follows that the ratio $\frac{It}{i}$ is an abstract number also,

* Continued from page 829.

and that i is therefore an exposure. We termed this symbol the inertia, and it really measures that exposure which will suffice to change a particle of silver bromide into the developable condition. But for its practical application it has another meaning. It measures the least exposure which will just mark the beginning of the period of correct representation.

The speed of the plate is the inverse value; the longer the exposure needed to bring the plate just to the beginning of the period of correct representation, the slower is the plate. Therefore we measure the speed of the plate by the value $\frac{1}{i}$.

The method we adopt for measuring the value of i is, briefly, as follows:—We give to the plate at least two exposures falling within the period of correct representation, and develop. We then measure the densities exclusive of fog. We thus obtain two equations connecting the two densities D_1 and D_2 with the two known exposures E_1 and E_2, viz.:—

$$D_1 = \gamma . \log \frac{E_1}{i} \text{ and } D_2 = \gamma . \log \frac{E_2}{i}$$

from which we obtain by elimination—

$$\log i = \frac{D_2 \log E_1 - D_1 \log E_2}{D_2 - D_1}$$

and—

$$\gamma = \frac{\log E_2 - \log E_1}{D_2 - D_1}$$

The value of i is expressed in candlemeter seconds, and can be found by reference to ordinary tables of logarithms.

We will now describe our practice. For the determination of the inertia, only the central portion of the plate should be used; the margin should be avoided, as it is liable to be irregular in thickness of film. In order to insure at least two exposures falling within the period of correct representation, we give to the plate eight different exposures of 2·5, 5, 10, 20, 40, 80, 160, and 320 C.M.S., leaving a portion of the plate unexposed. We develop this plate with ferrous oxalate, and, after properly washing, fix in a perfectly clean bath of thiosulphate. We then wash and dry spontaneously, or by means of alcohol. The length of time for development is judged by the density of the image. We avoid too great density, but develop sufficiently long to obtain a decided deposit for the lower exposures. When all the densities have been measured, we subtract from every one of them the density of the fog strip in order to obtain densities "exclusive of fog."

From this series of densities we may calculate the value of i. For that purpose we find the differences between the consecutive densities, and we choose from the series those points which give differences most nearly alike. As an example, we quote the series of results obtained with the Manchester slow plate of experiment No. 21:—

Exposures	2·5″	5″	10″	20″	40″	80″	160″
Densities	·085	·175	·250	·460	·755	1·010	1·270
Differences		·09	·075	·210	·295	·255	·260

We should take the results of exposures from 20 C.M.S. to 160 C.M.S. as those falling within the period of correct exposure. Choosing the exposures 20 and 160 for the calculations, we should obtain, in accordance with the formula given—

$$\log . i = \frac{1·270 \times \log . 20 - 0·460 \times \log . 160}{1·270 - 0·460}$$

or $\log . i = 0·787$, and, from an ordinary logarithm table, we should find $i = 6·12$ candlemeter seconds.

In another experiment with a plate of the same make the following results were obtained:—

Exposures ...	10″	20″	40″	80″
Densities ...	·300	·590	·910	1·260
Differences ...	·290	·320	·350	

Choosing only the 20″ and 80″ points, we have—

$$\log . i = \frac{1·260 \times \log . 20 - 0·590 \times \log . 80}{1·260 \times 0·590} = 0·771$$

or $i = 5·90$ candlemeter seconds.

It will be seen that these values for the inertia of the Manchester slow plate are almost alike. With faster plates it is not so easy to obtain quite such concordant values; but they are always sufficiently accurate for practical purposes, for, whether an exposure in practice be four or five seconds, it will not appreciably alter the resulting negative, so that in the determination of the inertia an error of ten per cent. is, fortunately, not of very great consequence, and in most cases two determinations carefully made will not differ more than 10 per cent.

We prefer, however, to obtain the result by a graphic method, by means of which we avoid all calculations and all references to tables of logarithms. We scratch on an ordinary slate a horizontal scale of inertias similar to the scale of an ordinary slide rule, but we repeat the scale four times instead of twice, as in the case of the slide rule. Diagram No. 11 shows this arrangement. We scratch at points 2·5, 5, 10, 20, 40, 80, 160, and 320 of this scale vertical lines (exposure lines), and divide them each into twenty equal parts, marking the highest as density 2·0, the lowest as 0. Having measured the densities, we mark them on the scales of the corresponding exposure lines, and draw a straight line through those points which appear to fall most accurately within such a line. It is better to stretch a white thread across these points, as the portion of the line can thus be more easily determined. Where the thread or the straight line intersects the inertia scale we can at once read off the inertia of the plate.

The solutions of the problem of ascertaining the inertia or its inverse, the speed of the plate, have hitherto been unsatisfactory, and always depended finally upon the judgment of the comparative visibility of letters or numbers printed upon a sensitive plate.

Our method, by referring the speed to a standard candle as unit, will enable different operators to obtain almost identical and definite numerical results. Should at any time a better practical unit of light be found, the method is at once applicable with it also. The fact is, we have based our method on the measured effects produced by a given unit of light, excluding the influence of alterations in development, whilst the present method, by means of Warnerke's sensitometer, depends entirely upon development. We could so alter the composition of the developer as to make a rapid plate give most misleading results.

Such a proceeding is impossible with our method.

(To be continued.)

Hackney Photographic Society.—Arrangements for members' lantern nights:—November 27th, "Kallitype Paper," Dr. Roland Smith; December 11th, exhibition of pictures and lantern slides (in competition, Messrs. H. P. Robinson and J. Traill Taylor judges) at St. Andrew's Hall, Hackney. Music. Slides will be put through the lantern during the evening.

APPARATUS AT THE PHOTOGRAPHIC EXHIBITION.

IV.

THE Watkins' exposure-meter is on view at the Photographic Exhibition, and is represented in the accompanying cut. Much intellectual skill has been displayed in the invention of this instrument, of the practical merits of which we shall speak farther on. The time of exposure of a plate in a camera depends upon a number of varying conditions, and the plan of Mr. Watkins is to measure these conditions, and to express their numerical values by means of slide-rules. These slide-rules are circularly placed, so that the whole instrument is little larger than an ordinary reel of cotton. Bacon distinguishes the philosopher from the empiricist by describing the former as a man who can divide and define. Certainly the instrument under notice gives the power of dividing and defining various conditions.

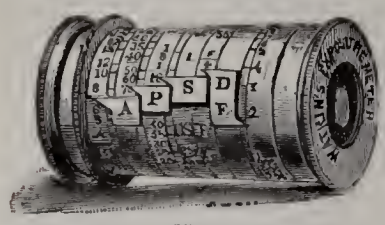


Fig. 13.

The measurement of the intensity of the light is effected by sensitive paper and a standard tint. The paper is prepared with bromide of silver, made to darken rapidly under the action of light by the presence of nitrite of potassium. Mr. Watkins once sent us one of the instruments, and we found that while the sensitive paper darkened to one tint, the standard tint alongside was of a different colour; it was also found that, after the sensitive paper had acquired a certain depth of tint, it remained thereat, and could be exposed much longer without perceptible change. All this put a stop to farther experiment, and Mr. Watkins says that the sensitive paper was not perfectly dry, hence the defective indications; he also says that of late he has been issuing a more trustworthy paper. So long as the paper contains deliquescent nitrite of potassium, it does not seem probable that its stability will be great. Mr. Watkins objects to the standard paper of Bunsen and Roscoe, on the ground that it is a chloride of silver paper; but is it certain that the darkening of bromide of silver paper is in exact relation to the formation of the invisible image on the same salt? The chloride paper had better be tried, or an analagous one of bromide.

Professor Bunsen and Sir E. Roscoe once devoted much attention to the experimental solution of the problem of preparing a photographic paper which should always possess the same degree of sensitiveness to light, and particulars relating to these researches will be found in *The Philosophical Transactions of the Royal Society* for 1863. Several other papers by the same authors, and published in *Philosophical Transactions*, should be carefully studied by Mr. Watkins, since they give a wealth of information on the subject of measuring the intensity of diffused daylight. The two investigators just named used pure paper, pure chloride of sodium, and pure silver nitrate, and, after an exhaustive series of experiments to eliminate error, adopted the following formulæ: 300 grammes of chloride of sodium were dissolved in 10 litres of water; the sheets of paper, about 0·3 metre in area, were one by one immersed in the solution; after five minutes' immersion each was taken out and suspended in a vertical position to dry. The sheets were next floated for two minutes each upon a solution containing 120 grammes of silver nitrate to 1 litre of water. After drying in the air from fifteen to twenty-four hours, this standard paper can be preserved in the dark without undergoing appreciable change in its sensitiveness. It was found by experiment that pieces cut from different parts of the sheet did not vary so much as one per cent. in sensitiveness. The standard tint was made by mixing 1 part of lamp black with 1,000 parts of oxide of zinc, and a long series of painstaking experiments was made before adopting this tint, for upon the tint much of the accuracy of the measurements of diffused daylight depends. The combined papers of the authors upon this subject would fill a volume, so to those papers must those interested in the subject refer. Suffice it to say, that later on the chemical activity of daylight at different times of the day was measured in different countries regularly by the method devised by Bunsen and Roscoe, and that the results of the observations are on record. In England the measurements were chiefly made at Kew Observatory.

A feature of Mr. Watkins' instrument is, that the adjustment of one of the rules is left to the judgment of the observer, and may be known as the "judgment ring." If the judgment of the photographer is to come in anywhere, why not use it in guessing the proper time of exposure, and not over the adjustment of a part of the actinometer?

Altogether, we think that Mr. Watkins has begun to solve a complex problem in a scientific way, and that his actinometer is now in a transition state, promising well for the future.

At the International Congress of Photographers at Paris, doubts were prevalent as to the practical value of any means of indicating proper exposures. Those who thought such instruments might be useful did so chiefly in relation to the photographing of interiors.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—The Photographers' Benevolent Association will give a lantern entertainment, by permission of the Photographic Society of Great Britain, on the 7th of November, at 5A, Pall Mall, London, from 7 till 10 p.m. Admission sixpence. Lantern at 8.45 p.m., with specially selected slides. The Association was founded in 1873.

THE "PHOTOGRAPHIC NEWS" YEAR-BOOK for 1891 will contain original articles by a long array of the chief writers and authorities connected with photography, including Capt. W. de W. Abney, C.B., F.R.S.; Dr. J. M. Eder, Director of the Imperial Institute of Photography at Vienna; Dr. H. W. Vogel, Professor in the Royal Industrial Academy of Berlin; Dr. Henri Van Heurck, Director of the Botanical Gardens of Antwerp; Mr. G. M. Whipple, B.Sc., Superintendent of Kew Observatory; M. Leon Vidal, Editor of the *Moniteur de la Photographie*, Paris; Professor W. K. Burton C.E., Tokio, Japan; Mr. Andrew Pringle; Mr. C. H. Bothamley, President of the Photographic Convention; Mr. Joseph W. Swan, M.A.; Col. J. Waterhouse, B.S.C., Assistant Surveyor-General of India; Sir David Salomons, Bart.; Sir H. Trueman Wood, M.A., Secretary to the Mansion House Committee of the last Paris Exhibition; Dr. T. L. Phipson, English Correspondent of the *Moniteur de la Photographie*; Mr. Francis Cobb, F.R.A.S.; Mr. John Spiller, F.C.S.; Mr. Arnold Spiller, F.I.C.; Mr. F. C. Beach, Editor of the *American Amateur Photographer*; Mr. Paul Lauge, President of the Liverpool Amateur Photographic Association; Mr. W. Lang, Junr., F.C.S.; Mr. James Mew; Mr. George Davison; Mr. Greenwood Pim, M.A.; Mr. W. S. Bird, President of the Photographic Section of the London Chamber of Commerce; Mr. H. P. Robinson; Mr. R. P. Drage; Mr. C. Fleetwood Pritchard; Mr. Frederick Varley, M.I.E.E.; Dr. C. S. Pattersou; Colonel W. L. Noverre, and many others well known in the photographic world.

REPORT OF THE PROGRESS OF PHOTOGRAPHY DURING THE YEAR CLOSING AUGUST, 1890.*

BY W. H. H. CLARK.

Photo-Mechanical Printing.—In this department there is nothing new to report, but the application for process blocks is rapidly on the increase. The photographic interviewer is coming to the front. Our large metropolitan dailies now photograph a man's gestures while he is being interviewed, and from the negatives process blocks are made which are printed with the report, rendering increased interest in the interview. Photographing lightning flashes, cloud effects, and meteorology, of drops of water while descending, of the effects of electrification of jets of liquid, of cannon and rifle balls in their flight, of wave sounds produced by the human voice, photographing the bottoms of oil wells, and at the depths of the deep blue sea discovering the condition of wrecked vessels, and so on, all go to show that photography is progressively advancing in all directions.

Animal Photography, under the leadership of Messrs. Muybridge and Anschutz, is making rapid strides; with results exhibited in the Zoetrope, the exact motions of the galloping, trotting, or running horse, and birds on the wing, are rendered in motion true to life.

Cameras.—This part of the photographer's apparatus is being multiplied indefinitely, but hand-cameras, erroneously called detective, take the lead, and there are some of wonderful make and extraordinary construction, and through them film photography is rendered nearly to perfection. The April number of the *St. Louis Photographer* published cuts, and a description of a machine hand-camera, which is operated by a crank, *à la* hand organ, and capable of taking a continuous series of negatives of street life in action, making a large number of exposures per second. The inventors have also invented a lantern, whereby views taken with the machine camera can be projected on to a screen, where street scenes full of life and motion can be viewed in an enlarged form. The automatic portrait machine is another wonderful contrivance, a drop-a-nickel-in-the-slot arrangement; the pictures produced are ferrotypes, commonly called tin-types. Although it is a wonderful piece of mechanism, the first cost of the machine, and constant attendance, coupled with the extremely low price of photographs, renders it doubtful if it ever pays the interest on the capital invested. It is a novelty, and as such will soon pass into oblivion.

The Educational side of photography has made little or no progress in this country. Germany is, without doubt, in the lead over all nations on the globe in respect of photographic educational facilities. Dr. H. W. Vogel is professor of an efficient school in Berlin; Zurich has its photographic laboratory; Herr W. Cronenberg is professor of a technical school at Schloss Gronebach; Austria has a splendid institution dedicated to photography, under the professorship of Dr. Eder; all of which have students from all over Europe and different parts of England and America, while here in America we have a bud or two which are trying to blossom, and have, no doubt, done much good. Quoting the President of the Photographic Society of Great Britain, Mr. C. H. Bothamley says:—"It has been proposed to found a Photographic Institute in this country, and we shall all be agreed that, founded on a right basis and conducted on right lines, it might be of incalculable benefit to photography. Founded on a right basis and conducted on right lines—that is the essence of the whole matter, so far as possible success is concerned. An Institute of Photography, I take it, should teach, and examine, and conduct original research. It might possibly also act as a court of arbitration in disputes involving technical matters, but the advancement of photography in all its branches and aspects, by teaching and research, should be its chief business. It should be thoroughly, though not ambitiously, equipped; it must be free from connection with commercial interests of any kind; above all, it must be free from the immaturism which so often clings round present-day amateurism." To which we should all say amen, and hope that a similar movement may soon be started in this country.

Developers and Development.—Under this head your committee has but little to report. Eikonogen has taken a pretty strong hold upon the craft, and is, perhaps, to-day used more extensively than any other agent for inducing the latent image to make its appearance on the exposed sensitive plates, and after the day's work is done the photographer can write his letters and figure up his profits or losses with spent eikonogen developer for ink. I am sorry not to be able to report progress in producing durable albumen prints, but the reverse appears to be the order of the day. It is patent to all that the albumen prints of to-day are not as durable as those made twenty years ago. I would also be glad to incorporate in this report an infallible remedy for that pest, blisters on albumen paper. Many remedies have been published, but in spite of them all, the trouble will now and again appear in the best regulated galleries. Is it really in the paper or the workman?

These may be minor subjects considered in the light of the more exalted questions concerning the progress of photography; still, they are important factors in connection with our progress. And it is to be hoped that the day is not far distant when these evils will be overcome.

* Concluded from page 831.

Astronomical Photography.—Professors Vogel and Eder appear to be constantly engaged in a noble competition as to which can contribute the most to the progress of photography and its application to the advancement of science and art. A short time ago we chronicled the triumph of manipulative skill accomplished by Professor Eder in photographing the image upon the retina of a beetle. We have now to record an equally conspicuous victory achieved by Professor Vogel in the realms of astronomy. It is unnecessary to remind our readers that the spectroscope many years ago enabled astronomers to demonstrate that certain fixed stars are in a state of motion, either towards or away from the earth. The evidence supporting this conclusion was furnished by the displacement of the principal lines in the spectra of the different stars. A large number of spectral observations of all the leading fixed stars have been carried out in the Potsdam Observatory by Professor Vogel, in conjunction with Dr. Scheiner, for a considerable time past. The result of these observations went to show that the displacement of the spectral lines was subject to periodic variation. Professor Vogel and Dr. Scheiner came to the conclusion that this variation was due to the motion of the earth in her orbit, as she is at one time of the year approaching certain of the fixed stars, and six months later receding from them. This annual variation in the displacement of the lines was accurately measured, and from the data thus obtained the velocity of the earth in her orbit was calculated. The result arrived at agreed, within a few fractions of a kilometre, with the velocity as calculated from other sources. It would not, we think, be too much to say that no greater triumph of the scientific application of photography has been achieved within the year.—*Invention.*

Notes.

Some of the most remarkable negatives ever produced are the five of the quagga in the Zoological Gardens, taken by Mr. Frederick York in 1872. On the authority of Mr. Bartlett, who for thirty-one years has been the Superintendent of the Zoological Gardens, we are able to state that, in all probability, the quagga is now extinct. He has no information that one has been seen either in the wild or the tame state for many years past. In South Africa the people often speak of Burchell's zebra as the quagga, but that is a mistake on their part. The quagga is a rather nice-looking animal, with ears and tail bearing some resemblance to those of the horse. In the front half of its body it resembles a zebra, and in the hinder half the common ass. Burchell's zebra is striped over its whole body, with the exception sometimes of the legs; its ears are frequently white. It roams in large herds over the plains to the north of the Orange river, but in yearly diminishing numbers. As the area of civilisation increases, animals of this class and carnivorous wild beasts are brought closer together in regions little explored by man; the quagga being heavier than the zebra, seems therefore to have been killed off the face of the earth first; the unfortunate zebra will follow. Mr. York is therefore in the position a man would have been in had he been the only person to photograph the last living dodo. A portrait of the quagga from the best of Mr. York's negatives will form the frontispiece to our forthcoming Year-Book.

Mr. A. de Blochouse, the president of the Brussels section of the Belgian Photographic Association, has been making a study of the early history of the stereoscope. He quotes a memoir published in Paris in 1860, in which Sir David Brewster sets forth that the instrument was known to Euclid, and was distinctly described by Galien 1,500 years ago. Sir David also said that Jean-Baptiste Porta described in 1393 not alone the principle, but the construction of the stereoscope, and how to make the two images combine. Such publication could scarcely have been pleasing to Wheatstone at the time, and the statements made by Mr. A. de Blochouse may be added to those, which shows how desirable it is that a school of historical criticism in photography should be established. Those who are in the habit of consulting ancient original documents are aware of the untrustworthiness of some of the items of alleged photographic history now accepted as true by the public.

Why does not one of the English photographic organisations appoint a committee to deal with all new discoveries in photography made in foreign lands? From the proceedings of most of our societies, it might be inferred that photographic workers do not exist outside the United Kingdom. In Paris the principles of action are different. Critics examine all the foreign journals for the Photographic Society of France, cull therefrom all that appears to be novel in photography, and an abstract of these extracts is read at the monthly meetings of the Society. The members are thus kept well informed as to what is going on in photography all the world over. The resolutions of the late International Photographic Congress in Paris, as to a rational system of nomenclature for photographic processes, well deserved consideration by photographers in other countries, and in our opinion were of such a sensible and useful nature as to be suitable for general adoption.

At Antwerp is the newest section of the Belgian Photographic Association, and it has taken firm root. Mr. J. Maes is the president; he is also president of the Association itself, and he is the chief photo-mechanical printer in Belgium. The section intends to hold an annual photographic exhibition in Antwerp. General experience in England is, that in any town of but moderate size, a good photographic exhibition once every three years is quite frequently enough, when quality of exhibits is held in view, and when it is not desired to tire the public by such displays.

Speaking to the verger of a certain cathedral one day, who was showing us over the building, we audibly expressed our regret that the Vandals of the past should have had so little respect for "the carved images thereof." Whereupon he told us, in a confidential manner, that those departed sinners should not be credited with all the blame, for the Goths of the present, in the guise of American tourists, were quite as bad. We resented this as a libel upon our transatlantic cousins, but the old man declared it was true. We recalled this episode last week, when we were shown an American photograph of a piece of stone which the label told us had been chipped by the artist from the summit of the great Pyramid of Egypt! Now, what can be done with a man who not only commits a crime, but hands to his friends a photograph of the evidence which convicts him of it? The Society for Protecting the Ancient Monuments of Egypt has evidently a difficult task before it if there are many of these travelling stonemasons about.

Another photograph which we lately saw was of a more innocent and interesting character. It represented a large number and great variety of insects which had committed suicide by flying into an electric arc light lantern. The brilliant light has a great attraction for all things which fly, and lighthouse keepers have often picked up large quantities of birds which have dashed themselves against their lanterns. In Bohemia just now the forests are being invaded by a greedy caterpillar which eats up every green thing, and the parent moth is being killed in great numbers by means of electric lights set up purposely to entrap them. Close by each light is a funnel, through which the air is sucked by means of an exhaust fan. The insects are drawn into the vortex by thousands, and are buried below ground.

It is often useful for a photographer to know how to cut off the bottom of a glass bottle; such an expedient, as is well known, will turn a common hock bottle into a respectable dark-room lamp. Here is a German method which is not generally known. Get some limewood charcoal, grind it up finely, and, by means of gum tragacanth and water, make it up into a paste and roll into pencils. One of these, when dry and ignited, will burn down slowly with a red-hot end. Take your bottle, put a drop of water on the spot where the division is to be, and nick it then with a file. Now touch the place, after wiping off the water, with your red-hot crayon, and the glass will crack. Follow this crack carefully round the bottle with your slow match; you can guide it in the right path, until the bottom falls in two halves.

An American paper gives a hint about sweeping a store without raising any dust, which will be useful to our readers. Do not sprinkle the floor with water, but place a line of wet sawdust right across one end of the room. Sweep this wet mass right along, bit by bit, to the other end, and on its march it will seize hold of every bit of dirt in its way without contaminating the air above. This plan should be valuable to photographers, who know well what damage can be done by flying dust, especially if it numbers among its particles traces of bronze powder, pyro, hypo, or other samples of matter in the wrong place.

The enterprising proprietors of papers of the "Bit" class are untiring in their efforts to find out fresh subjects of competition. The latest idea is a series of photographic contests, the competitors being the lady readers. The rules do not demand any knowledge of photography on the part of those who enter the lists, the only qualification being the possession of a fair amount of good looks. The thing, in point of fact, is a photographic beauty show. We do not know that any conditions are laid down as to touched or untouched photographs, but it is clear that this is essential. If the prize is to be awarded on photographic evidence alone, then all we can say is that nothing more misleading than this evidence can well be imagined unless retouching be sternly forbidden.

The painter who essays a portrait founded upon photographs enters upon a risky experiment—that is, if the original be alive, and has an opportunity of criticising the result. It seems that the disappearance of Henri Regnault's portrait of Marshal Prim from the Louvre Museum has led to much gossip, and the story of its early history has found publicity. The picture was painted entirely from photographs, and, when finished, the Marshal visited Regnault's studio in Madrid in order to pass his opinion upon it. The examination was not at all pleasing to the Marshal, and he asked the painter brusquely why he had made him look like a coal-heaver? Whether this effect was due to the painter, or to the photographer who furnished the materials upon which the painter worked, we are not told, but Regnault took the criticism to himself, and he left Madrid in anger, taking the picture away. In 1869 it was exhibited in the Paris Salon, and was ultimately bought by the State. It is stated that it will be shortly returned to its former place in the Louvre.

The old methods of extending trade are evidently played out in America. A milk jug or sugar basin "given away with a pound of tea" has no attraction for customers. Books as "premiums" were popular for a time, and one firm of publishers shipped no less than 10,000 atlases to American merchants for use in this direction; but, as a trade authority points out, there is one disadvantage attending this gift. When purchases to the amount of twenty dollars have been made, and the book has been secured, there is no particular inducement for the premium-getter to continue trading at the particular store, as one book is sufficient for one family. But this disadvantage does not extend to the use of enlarged photographic portraits as premiums, and the authority in question gives reasons for this opinion which all photographers will admit are full and convincing.

We learn, for instance, that when the picture of one member of the family has been secured and hung on the wall, there is a strong desire at once created for portraits of other members of the family to accompany it, and this desire makes the customer keep trading at your store so long as pictures are offered as premiums. When you withdraw the premium plan, you should have cemented the ties so strongly that the picture-getters will always be your friends. Another advantage possessed by portraits when used as premiums is, that a merchant is not obliged to purchase a large number in order to inaugurate his scheme, but can keep his capital untouched. When he finally has to order the pictures, he will have received enough cash trade from those desiring the premiums to give him plenty of money to pay for them. The original outlay is ten shillings, it only being necessary to have a sample portrait to show in your window. The authority shrewdly adds: "This had better be of yourself or of some handsome young lady well known in your town."

When royalty does condescend to handle the camera, "all the world wonders" at the marvellous results. During the visit of the Duke of Clarence to India, he took a number of photographs with the detective camera. These photographs have been enlarged, and, says a society journal overcome by admiration, they "certainly prove that his Royal Highness judged the exact moment for operation when grouping was at its best, chose the point of view of scenery that was most striking or picturesque, and put the camera to work when incidents were happening that were of more than ordinary interest, and worth recording." This combination of qualities is so rare that the Prince's photographs ought really to be exhibited for the benefit and edification of photographers generally.

ARTISTIC BLUE PRINTS.

THE end of the summer's wanderings, camera in hand, in field and forest, has come, and, with negatives all developed, the amateur's thoughts turn to the vexed question of printing. In these salad days of photography he has a wide field of choice. For his own collection there are the albumen, platinum, and bromide papers, but these are rather expensive methods, and hardly feasible for the large number of gift pictures which one likes to send to friends.

Here the blue print holds the field on the score of cheapness, and, when properly done, for delicacy and beauty as well. For some years I have been in the habit of making up a large number of blue prints for holiday gifts. These have all been made directly on the cards, doing away with the trouble of trimming and mounting, and, with the addition of a plate mark to give them a finish, they are all one could wish for the purpose for which they are used. Almost any good surface cardboard answers well. I am in the habit of using two or three-ply Bristol board, which seems to produce a richer blue than most other cardboards.

Any of the numerous formulæ may be employed for sensitising without much affecting the final result. My own formula is—

Red prussiate of potash	60 grains
Water	1 ounce
Ammonio citrate of iron...	100 grains
Water	1 ounce

The potash solution may be mixed in quantity, as it keeps well, but the iron solution should be mixed only as wanted for immediate use; the two solutions are mixed in equal parts immediately before using, and are applied to the cards with a Buckle's brush, which is nothing more than a piece of white cotton flannel doubled and bent over the end of a strip of glass and held in place with a rubber band. The ribbed side of the flannel is the one to use. In default of this, a soft sponge may be used. The solution is evenly applied, care being taken to avoid streakiness by not having the brush too wet, and by brushing lengthwise and across the cards. The sensitising may be done in subdued daylight. The cards soon dry, and are then ready for exposure.

As everyone knows, the best negatives for blue prints are those which we call plucky. None of the iron processes take kindly to thin negatives, and it is well to bear this in mind when selecting the negatives from which to make blue prints. The cards should be somewhat larger than the negatives, in order to leave a liberal margin of white card around the print. I use 8 by 10 cards for all sizes up to the whole-plate. The printing-frames must be as large as the cards, and provided with glass fronts. In order to protect the margins of the cards and insure their washing out white, masks of opaque paper, cut the same size as the cards and having a central opening the size of the print, are placed over the negatives, which are laid in the centre of the printing-frames.

After printing until the shadows are deeply bronzed, the cards are thoroughly washed in order to prevent subsequent yellowing of the whites. Before they are quite dry the plate mark is put in. For this purpose a sheet of hard cardboard is cut slightly larger than the printed portion of the cards, sufficient to leave a good half-inch margin around the picture, and the corners are slightly rounded off. Thin sheet brass is better if much work is to be done, but the hard cardboard answers fairly well. The proper position for the plate-card is easily ascertained by laying a piece of glass of the same size over the picture and marking or scoring the two upper corners with an ivory paper-knife. The glass form is then removed, and the plate-card put in place. The print is then placed on a piece of thick felt, the plate-card is covered with one or two thicknesses of blotting-paper, and the whole put under a letter-copying press for a minute or two. When removed from the press, the print will be found to be surrounded with a mark closely resembling the plate mark seen in copper-plate engravings. When dry, the prints are ironed or run through a burnisher to straighten them.

A very good substitute for embossing may be given to the margins outside the plate mark by cutting out an opening corresponding in size to the plate-card in a sheet of coarse sand-paper. After removing the plate-card from the print, the sand-paper is carefully adjusted in place and the pressure is again applied, thus producing indentations in the margins of the cards which at times have a very pleasing effect.

Three or four of these prints, bound in a cover of water-colour paper by punching a hole in the upper left-hand corner, and tying with a bit of ribbon, make a very pleasing and inexpensive birthday remembrance for a friend, and reflect no discredit on the taste of the maker.

There are many other charming applications of the idea, but they must wait for a subsequent paper for description. —W. H. B., in *The American Amateur Photographer*.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—An exhibition of photographs by the members will be held on December 16th, 17th, 18th, and 19th, at the Temperance Hall, Temple Street. Open each day from 10 a.m. until 10 p.m. There will be lantern displays each evening. Gold, silver, and bronze medals are to be awarded. In conjunction with this exhibition, the Warwickshire Photographic Survey Council purpose showing a collection of photographs taken during 1890 for the purpose of the Survey.

A NEW PROFESSION FOR WOMEN.—In spectroscopic work (in astronomy) the eye has been superseded of late, to a great extent, by the photographic plate, which is now able to recognise fainter impressions than the eye, and to register them permanently. Professor Pickering has been continuing at Cambridge his remarkable work, and it is also being carried on in the southern hemisphere by a party sent there in connection with the Draper memorial. The instrument employed is a photographic telescope, with a prism or a series of prisms in front of the object-glass, the whole mounted like any large telescope, and provided with an accurate driving clock. With an instrument of this kind we obtain upon the sensitive plate the spectra of all the stars which happen to be in the field of view—sometimes a hundred at a time, as when a cluster like the Pleiades is in question. This method has made it possible to complete, in a comparatively short time, a general survey of the spectra of all the brighter stars of the northern hemisphere, and the survey is now being extended to the southern hemisphere, where it is already well advanced. Whenever the spectrum of a star thus photographed on a small scale is found to present any interesting peculiarity, it is examined with a more powerful instrument, which photographs its spectrum on a much larger scale, and this second photograph is then enlarged again for special study. It is worth recording here that the examination of the Harvard photographs has been made almost entirely by women, who are assistants in the laboratory. A niece of Dr. Henry Draper, whose memorial is now being erected in the form of this monumental work—the spectroscopic survey of the heavens—had the good fortune to discover in the star spectra the delicate doubling of the lines which has proved so full of information.—*Prof. Charles A. Young.*

WILD BEAST PHOTOGRAPHY.*

In the queer little back garden of a queer little house, in a queer little road, which is composed of many other queer little houses, mostly of a shy and retiring nature, and within a thousand miles of the Zoo., Mr. Gambier Bolton has his headquarters and studio, the latter, as he remarks, being the largest in the world, for it is the world itself. Picture not artistic luxury, but conjure up a clump of gnarled and withered timber which still bears a scanty crop of foliage, and is apparently sent by nature for the purpose of holding the extremely heavy sootfall peculiar to the neighbourhood. On a rough wooden platform, supported by trestles, a monster yellow Tom sits trimming his whiskers, and gazing with melancholy indifference at a grey Tom who has taken up his position on a neighbouring wall, and is twisting his tail about in an aggravating way, as if on sport intent. The fact is that yellow Tom has no tail, being a Manxman, and the two are rivals in love, and grey Tom is laughing at him. The Manxman is Mr. Bolton's favourite puss, who earns a respectable livelihood by tantalizing dogs. I have heard of many queer professions (writes our representative who recently spent a morning with Mr. Bolton), but this is surely the queerest on record. Let me explain why the Manxman has taken up this line of business in preference to mousing, or ratting, or killing off the sparrows.

Dog owners who want really artistic photographs of their favourites take them up to the queer little house, but you can't take a good photograph of a dog in a room or an indoor studio. He may be shy, or sulky, or savage. So Mr. Bolton just turns him into the queer little back garden, and watches him for half an hour from the window; he is then put on to the platform, and the camera is made ready. But a dog on a platform is a melancholy object. He is probably depressed by his strange surroundings, his face is long, his ears are limp, his legs are loose, and his *tail is down*. The Manxman is now introduced. Watch him stealing furtively along the path until he catches the eye of the sitter—hey, presto!—the eyes sparkle, the ears are erect, the legs stiffen, and, gentlemen, the *tail is up*, and the trick is done. Sometimes the Manxman fails, in which case the monkey appears on the scene. He had a good training at Mr. Carrington's. If both the Manxman and the monkey fail, the squeaking rat is introduced, with instantaneous effect. The queer little back garden contains other receptacles for animals—namely, a few cats and kittens, which have been used as models this past season, and there is a red dachshund—"Bruce," the picker-up. I think his profesion is even more peculiar than that of the yellow Manxman, the professional tail-raiser. Several cats and dogs having been poisoned in the neighbourhood, "Bruce" is turned loose night and day to pick up any little trifles, such as a lump of meat, liver, or bread containing prussic acid, &c., which might find its way over the wall and into the interiors of the valuable canine and feline boarders and residents in that queer little establishment. And here comes the resident model, "Pickle," a smart little fox-terrier, who has the knack of always standing or lying in a picturesque position. In taking your walks abroad, you must often have been struck by the splendid picture-photographs of lions, tigers, elephants, hippos, zebras, and ever so many other wild beasts which are exhibited in some of the shop windows. These are the results of Mr. Bolton's prolonged and assiduous studies and experiments, which I am now about to describe.

On an easel in Mr. Bolton's little drawing-room stands a magnificent picture (from a plate 44 by 36 inches), or, to be technically correct, a carbon photograph, of "Prince," the great lion at the Zoo. "I spent three days of five hours each in producing a satisfactory negative of that," said Mr. Bolton; "there's patience for you. You see, my Draconian rule in animal photography, which I have made my speciality, is: The animal shall be standing, free of the bars, free of shadow, and all four legs and the tail showing, with a natural background. No dodging and no combinations, and no double printing for me, or naturalists and scientists would bid me go hang." For three days, then, Mr. Bolton tried to take the big lion, and success rewarded his efforts at last. The photographer who deals with lions and tigers has often a good "run for his money," as the sportsmen say, for the lens of the camera is thrust between the bars of the cage.

(To be continued.)

* From the *Pall Mall Gazette*.

EIKONOGEN FORMULÆ.

The following formulæ were issued long ago by the manufacturers of eikonogen, and down to the present time the said manufacturers have seen no reason for making any alterations in them:—

A.—For portraits and landscapes.

(1) 4 parts sulphite of sodium are dissolved in 60 parts water. To this solution add 1 part of eikonogen, which has been previously finely powdered by means of a mortar, and dissolve by shaking. Should a mortar be wanting the solution can also be prepared in the following manner: To 4 parts sulphite of sodium and 1 part eikonogen, which are placed either in an earthern or enamelled vessel, 10 parts water are added, and solution is brought about by boiling and stirring. The hot solution is then poured into a flask containing 50 parts cold water.

(2) 3 parts crystallised carbonate of soda are dissolved in 20 parts cold water. Immediately before developing mix 3 parts of solution No. 1 with 1 part of No. 2.

B.—For instantaneous photographs with detective cameras.

For this purpose formula A is to be used, with the exception that the crystallised carbonate of soda is substituted by the same quantity of carbonate of potassium.

C.—For very short instantaneous exposures, and for increasing the power of the developers A and B in cases where the plate has not been sufficiently exposed.

5 parts sulphite of sodium, 2 parts carbonate of potassium, and 1 part of eikonogen, are placed in an earthen or enamelled vessel, and to these are added 30 parts water; solution is brought about by boiling and stirring. After having been allowed to cool, the developer, which is now ready for use, is preserved in a tightly closed bottle. The developer, if it has been prepared exactly according to the above method, keeps in good condition for a long time.

The following is a fixing bath for plates which have been developed with eikonogen.

Plates which have been developed by means of eikonogen should be well washed, and will greatly benefit by being fixed in a bath composed of 4 parts hyposulphite of soda, 1 part bisulphite of soda, 20 parts of water. The advantages of fixing in this bath are that:—

(1) The negatives have a perfect tone, which enables very fast printing.

(2) The new fixing bath remains, even after frequent usage, clear and water-white.

(3) The plate need not be bathed in a solution of alum before fixing, and it is therefore not possible that the plate should

be covered with a white layer in consequence of insufficient rinsing.

Should the nature of the plate require that the coating be hardened, then there is no objection to an alum bath being used, either before or after fixing, yet the quantity of alum added must not exceed 1 part to each 20 parts of water, as a stronger solution might cause the gelatine to blister. The bisulphite of soda can be replaced by ordinary neutral sulphite of soda (the same as is used when developing with eikonogen), provided that the bath be acidulated by means of a little sulphuric acid. In this case it should be made up in the following manner: Dissolve 20 parts hyposulphite of soda and 5 parts neutral sulphite of soda in 100 parts water, to which add slowly 1 part concentrated sulphuric acid. This bath, if properly prepared, answers the same purpose as the other, also remaining clear and water-white.

Formula for developing gelatine-bromide paper with eikonogen.

The paper, having been exposed to the light, is soaked in 40 parts water. The paper is hereupon taken out, and 10 parts of a solution prepared according to formula C are added to the bath. Should the picture be slow in appearing and the details not be perceptible, then add gradually a farther quantity of solution C. If the paper has been exposed too long, only a small quantity of solution C must be used from the commencement. The addition of bromide of potassium is often the cause of the details not forthcoming; it should therefore not be employed. After developing, the picture should be well washed and then placed for several minutes in an alum bath, whereupon it is again washed and fixed. It may here be stated, say the eikonogen makers, that the crystallised carbonate of soda employed in the formula need not be pure, but of the same quality which is used in every household.

Patent Intelligence.

Applications for Letters Patent.

16,238. H. H. Beale, Somerley, London Road, Reading, "The Treatment of Negatives by a Liquid to be called 'Non-actine.'"—October 13th.

16,339. C. Beck, 23, Southampton Buildings, London, "Cameras."—October 14th.

16,620. S. D. Williams and W. A. Edwards, Moorlinch House, Clytha Park, Newport, Mon., "Photographic Apparatus."—October 18th.

16,668. D. Cameron, 6, Church Street, Inverness, "Screw and Plumb-bob Level for Camera Stand."—October 20th.

16,696. G. H. P. Burne, 54, Fleet Street, London, "Photographic Shutters."—October 20th.

16,803. S. D. McKellen and Eliza A. McKellen, 3, Chapman Street, Manchester, "Hand-Cameras."—October 22nd.

17,012. G. L. Anders and C. H. Elliott, 4, Moorfields, London, "Use and Application of Celluloid."—October 24th.

17,073. J. Taylor, 6, Livery Street, Birmingham, "Additions to Pictorial Representations."—October 25th.

Specifications Published.

16,558. *October 19th*, 1889.—"Photographic Cameras." Herbert George Heyburn, 16, Upper Montagu Street, London, Optician.

My invention has for its object to provide a combined camera and box, or receptacle for sensitised plates or surfaces, which is very simple in construction, and not liable to get out of order, the plates or sensitised surfaces being successively discharged, exposed, and then returned to the box in any desired order. According to my invention, I so combine the storage box with or attach it to the camera, that it can be moved relatively thereto, so that either of the plates therein can be brought opposite to a slot in the camera, sufficiently wide to admit only one plate at a time therethrough, and into the guides or supports for the plate in the camera. In connection with the storage box, I use a shutter which can be brought into such a position that it leaves only the desired one of the plates in the storage box at liberty to pass out therefrom. The portion of this shutter which protrudes from the apparatus may be marked so that it can readily be used as an indicator as to which of the plates is at liberty to be passed into the camera when it is brought into line with the slot in the camera.

18,167. *14th November*, 1889. — "Photographic Camera Shutters." William James Lancaster, Colmore Row, Birmingham, Manufacturing Optician.

This invention relates to camera shutters, or means for obtaining instantaneous or extended exposure, whereby light is allowed to pass momentarily or otherwise through the lens or exposure aperture, at the will of the operator; and which said invention, designated by me the "Chronolux" time shutter, is an improvement upon Application for Letters Patent made by me on the 29th day of January, 1889, and numbered 1,543.

The apparatus consists

1. Of two circular piereed shutter plates, sliding in reverse directions to and fro upon each other in manner that the piereed and unpierced parts respectively overlap each other, and thereby either form an opening or close one.

2. In means for working the shutter plates.

3. In a pneumatic operator and releaser.

4. In the combination of the time mechanism, described in my cited patent, with the operating means, and circular piereed shutter plates, as aforesaid.

20,009. *12th December*, 1889.—"Photographic Cameras." Reginald Haddon, of the firm of Herbert and Co., Patent Agents, 18, Buckingham Street, Strand, W.C., Civil Engineer; a communication from abroad by the firm of C. A. Steinheil Söhne, Opticians, Munich.

This invention relates to photographic cameras, and consists in improved mechanism for controlling the exposure, and improved mechanism for changing the plates within the camera. It can be adequately described alone by the aid of drawings.

18,224. *November 14th*, 1889.—"Photographic Shutters." Henry Grant Madan Conybeare, of "The Hut," Ingatestone, Essex, Gentleman.

This invention is an improvement in photographic shutters for making so-called instantaneous exposures. In carrying out my invention I use a box, preferably of wood or other material. This box has an aperture on each side of it, one of them of such size as to fit on the front or back of the lens with which the shutter is to be used. In the box I fit three hollow rollers, preferably of brass tube. Two of the rollers are placed at one end of the box, and one at the other end. One of the two rollers which are placed near together contains a spring, as in the spring rollers used for window blinds. But the spring may be made like a watch spring, and placed in a small case on the end of one of the rollers. To one of the two rollers at one end of the box, I attach narrow bands or strips of silk ribbon or tape, one at each end. These strips are carried to the other end of the box and passed over the ends of the one roller; they then return to the other end of the box, and are passed once or more times round the third roller containing the spring, and the ends attached to the said roller. To these two bands I fasten a piece of cloth, preferably macintosh cloth, so that it comes between and just covers the two apertures, which are in the opposite sides of the box, thus forming a blind. To actuate the shutter, I turn round one of the two rollers at one end, the one which does not contain the spring; this draws the strips or bands off the other roller, causing it to revolve and wind up the spring contained in the roller. This at the same time draws the blind from between the apertures, over the roller, at the other end of the box, and back, on the other side of the roller, between the apertures in the box. The rollers are then held and prevented from revolving by a ratchet and pawl attached to the axle of one of the rollers. The rollers may be released by hand or by a pneumatic release. The axle of the roller containing the spring may also be fitted with a ratchet or other arrangement, enabling the spring to be wound up independently of the blind.

The instantaneous exposure is made by releasing the ratchet, when the spring draws the blind from between the apertures over the roller and back again between the two apertures in the box.

19,205. *Nov. 29th*, 1889.—"Giving a Matt Surface to Albumenised Prints." John Buxton Payne, 33, Soho Square, London, Gentleman, a communication from Frederick Charles Binns, of Wellington, New Zealand, Photographer.

This inveution consists of an improved process or means for giving albumenised silver paper, photographs, or prints, a matt surface resembling matt opal plates or unpolished marble.

Accordiug to this inveution, a sheet of finely-ground glass (preferably plate glass), marble, slate, metal, or other material having on one side a finely ground or unpolished matt surface, is taken as a support for the albumenised silver paper, photographs, or prints to be treated, and it is coated (by means of a pledget of flanuel, or by other suitable means) with a solution of wax and guin, or resin, in a suitable solvent. This I will call the "waxing compound." The following has been found to answer well in practice. Dissolve by heat three drachms of best beeswax and three drachms of yellow resin in one pint of spirits of turpentine. The proportions of the beeswax and resin vary with the temperature of the air; when very warm the resin should be present in greater proportion than the beeswax. It is iupossible to give one fixed forniula for every degree of temperature, but the above is correct for general conditions in temperate climates.

The coating of the plates with this waxing compound may be effected in the following manuer:—

A quantity of the waxing compound, sufficient to coat each plate, is poured on to the pledget of flannel or like rubber, and the ground or matt surface of the plate is rubbed therewith, preferably with a rapid circular motion, uutil the whole is evenly coated. It is then polished, which can be done with a clean linen cloth, until the surface is smooth and free from waves, streaks, or marks, taking care in doing so to leave a thin even film of the compound on the plate.

When the plate has thus been treated it is set on edge in a place free from dust, and allowed to remain in that position for, say, twenty-four hours, until the solvent has evaporated. If this be not attended to carefully, the coating of gelatine and oxide of zinc, which the plate is subsequently to receive, will set in uneven patches, spoiling the resulting surface of the picture and rendering it liable to stick.

The following mixture, which I will call the "gelatine zinc compound," is then to be prepared. Gelatine, such as that of Coignet Pere et Fils et Cie., or any other suitable gelatine, is added to cold water. The proportion of gelatine to water depends upon the quality of the gelatine employed, but for that made by Coignet Pere et Fils et Cie., two ounces of the gelatine to twenty ounces of water is a proper proportion. The gelatiue and water are then subjected to heat in any suitable vessel, and when the gelatine is dissolved oxide of zinc and glyceriue are added, gently stirring with a glass rod until the ingredients are thoroughly incorporated.

The quality of ordinary commercial oxide of zinc varies. If the ordinary quality sold by chemists be used, suitable proportions will be: Oxide of zinc one half of an ounce to oue ounce of glycerine.

If Hubbock's oxide of zinc be used, fifty grains mixed with one quarter of an ounce of glycerine are suitable proportions.

Any suitable dye or pigment may be added to this formula for the purpose of tinting the resulting "matt opal-type."

The oxide of zinc, glycerine and dye or pigment (if any) should be thoroughly brayed in a mortar until they form a smooth paste, before they are added to the gelatine solution. When the oxide of zinc and glycerine (coloured or not) are thoroughly incorporated with the gelatine solution, the mixture should be strained or filtered, which can be conveniently and efficiently done through a flannel bag.

A plate coated with the waxing compound from which the solvent has evaporated, as hereinbefore described, is then covered with the gelatine-zinc compound, which should not be used at a higher temperature than 130° Fah. when the plate is dipped in the solution, and not higher than 108° Fah. when the solution is poured on to the plate, which may be effected in any of the modes used for photographic enamelling, or otherwise at the discretion of the operator.

When the gelatine-ziuc compound has set upon the plate (which will be usually in about a quarter of an hour), the plates will be fit to receive the albumenised silver print, which is prepared by first immersing it in clean cold water to render it flat and pliable. The coated plate is placed on a stand coated side uppermost, and is flooded with clean cold water, and the surface is carefully brushed (which may be done with a broad flat camel's hair brush) to remove any particles of foreign matter, and the plate is then flooded again with clean cold water. The silver print is then taken from the water, and placed carefully face downward on the plate, care being taken to avoid the formation of air-bubbles; "squeegee" in the usual manner, and then wipe with a sponge.

When glass plates are used, the uuderside should be examined for air-bubbles, or particles of dust, or other foreign matter that may have got betweeu the face of the print and the coating compound, aud if anything of the kind be present the print should be removed, washed and brushed again, and fixed anew.

When the print is satisfactorily attached to the plate all free moisture should be wiped away, which may be done with a sponge.

A backing of paper or other suitable material may then be applied to the print, and the whole may then be placed in a rack to dry, which will usually be completed in fine summer weather in from about eighteen to twenty-four hours. When thoroughly dry the print is removed from the plate, which can be done by inserting a penknife between it and the plate, and the print will leave the plate with the greatest ease, having a beautiful matt-surface pure in tint and fine in texture.

If desired, in place of the gelatine-zinc compound a solution of gelatine alone may be used, but it is preferred to use oxide of zinc or some equivalent pigment, as it gives a desirable "bloom" to the picture.

359. *8th January*, 1890.—"Photographic Cameras." A communication from Frank A. Brownell, Rochester, United States. Alfred Julius Boult, 323, High Holborn, London, M.I.M.E.

The present iuvention has for its object to provide a camera that cau be folded within small compass for carrying, and can be so extended as to take quite a large picture, and it further has for its object to provide said camera with ueans for utilising roller holders for flexible film, thereby providing a comparatively small detective camera, which is not only capable of taking large pictures, but also of containing sufficient material for a large uumber of them, these being the objects most sought after in articles of this description.

Iu the patent the details are given by the aid of drawings.

12,741. *August 14th*, 1890.—"Photographic Objectives." Ernst Gundlach, 112, South Avenue, Rochester, United States, Opticiau.

My improvement relates especially to photographic objectives, or combinations of optical lenses, used for the purpose of taking photographic portraits, views, and other subjects.

All the best photographic objectives of modern type consist of two achromatic or aplanatic meniscuses, this form of lenses being the best adapted for the purpose of obtaiuiug a wide angular field with a miuimum of distortion at or near the edges of the picture. But while, for said purpose, the meniscal form offers great advantages over any other kind of lenses, a disadvantage of the same, however, lies in the difficulty of correcting its optical aberrations, both the spherical and the chromatic, at the same time, without leaving too great amounts of the so-called "aberrations of second order."

The object of the improvement is the reduction of said secondary errors to an imperceptible miniuum.

The iuventor claims:—

In a photographic objective, a compound meniscus, consisting of a negative flint-glass meniscus, a negative crown-glass meniscus, and a positive crown-glass meniscus, so combined that the flint-glass meniscus is enclosed by the two crown-glass meniscuses, facing with its convex side toward the concave side of the negative crowu-glass meniscus, and with its concave side toward the convex side of the positive crown-glass meniscus.

Correspondence.

SPHERICAL ABERRATION AND DEPTH OF FOCUS.

Sir,—The length of Mr. Dallmeyer's letter, and the time which he has allowed to elapse before attempting to reply to my article of the 19th September, will probably serve, with those readers not especially interested iu the subject, to disguise the fact that it is essentially no reply at all to what I have put forward.

If modes of explanation dealing with the transversal measurements of spherical aberration have been "exploded" by Mr. Dallmeyer, not only have I and Mr. Grubb been arguing upon a false foundation, but so have all scientific writers upon the question, includiug Mr. N. E. Duuer, whose exposition in the last two numbers of the Photographic News would, iu that case, be mere waste of paper. As a matter of fact, transversal measuremeuts are of essential importance.

Mr. Dallmeyer's statement that the apex of the axial cone of rays is the best focus, is easily shown to be not in accordance with the fact. If in a leus possessiug spherical aberration we place a small diaphragm, we are workiug near the apex, although still somewhat short of it. If we now remove the diaphragm so as to allow the effect of spherical aberration to be visible, it will be found that the lens has to be racked inward to get the best focus. Obviously, if the apex of the axial coue were the best focus, this removal from it would not be necessary. The fact that with a lens not thoroughly aplanatic the position of the best focus is altered by the insertion of a diaphragm, is so well known that it is surprising that Mr. Dallmeyer should venture on a statement involving the fixity of that positiou.

Mr. Dallmeyer, whilst writing on my commeuts upon the photographs illustrating his Camera Club paper, has not offered any explauation of the fact to which I particularly invited attention, namely, that the photographs numbered ix. and xvi., which were stated to be taken at distances of $\frac{1}{10}$ of an iuch and half an iuch from the focus, were actually in better focus than Nos. viii. and xv., stated to be in the best focus. It is, indeed, not easy to see how any explanation could be given, and Mr. Dallmeyer's silence on the point must be accepted as sufficiently suggestive.

Experimental proofs, when fairly conducted, are of the greatest value; but an experiment in which can be found evidence of its not having been carried out under the conditious stated with regard to it, is worse thau useless. W. E. Debenham.

A PERMANENT EIKONOGEN COMPOUND.

Sir,—We have pleasure in informing you that the manufacturers of eikonogen (the Actien Gesellschaft für Aniliu Fabrikation, Berlin) have now succeeded in producing this admirable developer so that it is free from any liability to discolour. The changes necessary for obtaining this desirable quality necessitate that the eikonogen be issued in the form of a powder. The manufacturers assert that they have arrived at this result by means of a preservative, and all consumers may confidently rely that this uew uethod will keep the eikonogen perfectly free from discolouration. The old formula remains without any change. Marion and Co.

Soho Square, London.

GELATINO-CHLORIDE PAPER.

Sir,—I notice an article in your issue of 24th inst. on the subject of "Gelatino-Chloride Paper." You there practically state that there is no such paper made iu Eugland, and that we are indebted entirely to our Continental neighbours for the manufacture of the material for this most charming process of priuting-out. There are only two known makers of this paper on the Continent, and these are Obernetter and Liesegang, but you appear to have overlooked the fact that my firm placed on the market, over two months ago, an improved gelatino-chloride paper called "Celerotype" (or swift printiug) and that this paper is manufactured on their owu premises. It is very satisfactory to find that it is preferred to the foreign make. You say "it is difficult to understand why our manufacturers have allowed this branch of photographic industry to remain in the hands of foreigners." Well, the reason is not far to seek. The successful manufacture of a good gelatino-chloride printing-out paper is beset with so many difficulties and requires such close supervision, that few would care to undertake it. The paper we make has, iu addition to its own special qualities, all the advantages you mention in your article, and has this claim on all patriotic Britous, that it is prepared by British hands, with British materials, and by a British firm.

William Gourlie Blackie,
Manager to the Blackfriars Photo. and Sensitising Co.,
1, *Surrey Row, Blackfriars Road, 27th October.*

THE PHOTOGRAPHIC MANUFACTURERS' AND DEALERS' ASSOCIATION OF THE UNITED KINGDOM.

Sir,—I have the pleasure to iuform those of your readers who are interested in the photographic trade, that the above Association is now fully established, and is getting into working order. Offices have beeu taken at No. 7, Southampton Row, Holborn, W.C., and a permaneut secretary appointed, so that in the course of a very few weeks the Association will probably begin to make its influence for good felt throughout the trade. Naturally a considerable amount of time has to be spent in arranging miuor details, as an uudertaking of this description cannot be floated by the "instantaneous process."

To buyers of photographic material, both at home and abroad, the Association will prove of considerable value, as they will know, when dealing with a member of the Association, that he is a *bonâ fide* manufacturer or dealer, as the case may be.

The Council would esteem it a great favour if any cases of unfair or dishonest trading, with full particulars thereof, be imuediately reported to the Association. Such communications will, of course, be treated as strictly coufidential.

All communicatious should be addressed to the secretary, Mr. F. O. Bynoe, 7, Southampton Row, Holboru, W.C.

Birt Acres.

131, *Richmond Road, Hackney, N.E., 28th October.*

ALPHA PAPER.

Sir,—In your issue of 24th inst. you write of alpha paper in the past tense, as if such a thing was not now in existence. May we undeceive you in this by saying that the sales of this paper are larger now than ever they were.

The Britannia Works Co.

Ilford, London, E., Oct. 27th.

[Alpha paper is in widespread use now, and we print on it sometimes; a large variety of tones may be obtained with it by modifying the development.—Ed.]

The Photographic Club will hold its annual general meeting for the election of officers and other business on November 5th, and the annual dinner will take place on November 19th.

Brixton and Clapham Camera Club.—On November 6th, at 8 o'clock, a lecture, illustrated by the lautern, and entitled "A Tour in Brittany," will be given by Mr. A. R. Dresser, in Gresham Hall, Gresham Road, Brixton.

London and Provincial Photographic Association.—Subject for November 6th, "The Unnatural Character of so-called Naturalistic Focussing" (second evening), Mr. W. E. Debenham; November 13th, lantern night, judging of competition slides.

Sachse's Developer for Orthochromatic Plates.—Mr. Sachse uses for this purpose:—Sulphite of soda, 5 drachms; eikonogen, 45 grains; quinol, 15 grains; distilled water, 8 ounces. Heat the water to the boiling point and add the sulphite. When dissolved, add the eikonogen, theu the quiuol. Shake until thoroughly dissolved. Allow the solutiou to stand for ten hours, and add 90 graius of carbonate of potash. For use, take equal parts of this solution and water. The picture should come up quickly aud perfect in details, with full deusity iu the shadows.—*American Journal of Photography.*

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At the technical meeting of this Society held on the 28th inst., Mr. T. SEBASTIAN DAVIS in the chair, the apparatus in the Exhibition was shown and explained.

Mr. A. WATKINS, in demonstrating the method of using his exposure meter, said that hitherto calculations for exposure had not sufficiently taken into account all the factors. Each factor—light, speed of plate, subject, and diaphragm or aperture—had its own influence, and should be accounted separately. In his instrument a separate column was assigned to each factor, and these columns were adjustable to one another on the principle of the slide rule. Having ascertained the value of the light by means of an actinometer containing paper coated with gelatino-bromide of silver, and sensitised for direct printing action by nitrite of potash, the column denoting light was set to the figure representing the power of light at the moment. The other columns were then set, each to the number belonging to the particular case, and at the last column an index would be found pointing to a number representing the exposure required.

Mr. T. SAMUELS showed his magazine camera, to which certain improvements had been adopted during the last year. At the front of the camera a sliding U-piece sustained the bellows and lens board. This U-piece allowed the front considerable motion, both laterally and vertically, as well as a swinging movement. Lenses of various length of focus could be used, and there was a scale marked with the distance for each lens, both when photographing objects far off and at certain nearer planes. The cases both for the camera and stand were not entirely removed, but merely opened out for use, an arrangement in virtue of which the repacking was very quickly performed. Similar cases, but made of Willesden paper, and stated to be light, efficient, and easily constructed, were also shown.

Mr. W. H. Humphries' hand-camera was shown, and the method of working it demonstrated. The plates were in metal carriers lying horizontally at the back of the camera, and were drawn out one at a time by a simple movement, held in position, and then transferred to the top of the pile from which they had been removed.

Messrs. Morley and Cooper's exhibits included a French automatic time and instantaneous shutter, and a camera and stand very light in construction.

A dark slide with a locking arrangement, preventing the shutter from being drawn out again when once it had been opened and closed, was shown by Mr. G. Renwick.

A plate rocking apparatus by Messrs. Lewis was put in action.

The Excelsior plate washer of Mr. W. Rooke was shown. The spray pipe was fitted to floats, so that it was always kept at the same height from the water.

Messrs. Pearson and Denham's reducing camera, and Swindon and Earp's hand-camera, in which certain improvements had been effected since last year's Exhibition, were put before the meeting.

Messrs. Mawson and Swan's exhibit included Loman's reflex camera, and a smaller one called the "Sport" camera, as well as Hume's cantilever enlarging apparatus, and Payne's photo-micrographic apparatus.

Mr. J. R. Gotz's camera, with aluminium fittings, was next shown, and the exhibits of Messrs. Shew and Crouch were also displayed.

Mr. W. England showed holders for celluloid films of large size intended for use with the ordinary dark slide.

Dr. LINDSAY JOHNSON said that at the Berlin Medical Congress he had seen pencils made for writing upon glass, and, thinking they would be of service in photography, had brought them to the meeting. They were of various colours—red, blue, violet—and very suitable for working on either the back or front of the negative, as well as for writing upon it.

M. LEON WARNERKE said that wax was their chief constituent.

THE CAMERA CLUB.

On Thursday, October 23rd, Mr. E. J. HUMPHERY read a paper at the Camera Club, entitled "The Direct Reproduction of Negatives and Positives." Mr. A. MASKELL occupied the chair.

Mr. HUMPHERY described his method of obtaining positives and negatives direct from positives and negatives in one operation, by the reversal of the image. He stated that he had been led to his experiments by a conversation between himself and Mr. Bergheim. The method was to give an exposure many times greater than that for normal development, then to develop with an extremely dilute developer; the result was a printable negative from a negative, or fair positive from a positive. Prints taken from the secondary negatives were handed round, and the lecturer said that he hoped to so improve the results as to obtain the second negative as free from fog as the original. He added that the method was useful in photomechanical processes in which reversed negatives were necessary.* Positive prints upon platinotype paper made into excellent transparencies by treatment with paraffin, were also shown.

Dr. PATTERSON, who had seen the experiments of Mr. Humphery, said that it was almost inexplicable to him to see the rebate developing black in these plates. He believed that Dr. Jaussen was the first, and in 1880, to draw attention to the phenomenon of several successive reversals, but the matter did not seem to have been taken up practically anywhere. The plan of Mr. Humphery was to expose a plate eight or ten times longer than usual, and to develop with a solution one-eighth of the normal strength; he, however, always obtained a certain amount of fogging on the plate, due, perhaps, to not hitting exactly the right time of exposure; in negatives this slight fogging does not matter. Transferotypes could thus be obtained without going through their present reversing process.

Mr. LYONEL CLARK remarked that when reversals were thus obtained by contact and exposure to even weak diffused daylight, the plate must be subjected to vastly more than eight or ten times the normal exposure. He thought that the first man who obtained reversals was Goddard or Claudet—he was not good at remembering names—in 1842 or 1843. A remarkable paper full of information on the subject, had once been read before the Physical Society, in connection with the photographing of the dark streaks of lightning. The fact of the rebates coming out black he thought to be purely the effect of halation. Nobody that evening had touched upon the theory of the reversal of the image.

The CHAIRMAN described a case in which there appeared to have been a double reversal of the image.

Mr. GEORGE DAVISON thought the greatest objection to the method to be the amount of fog on the plates.

Major J. F. NOTT remarked that, with certain printing frames, fog was obtained when producing lantern slides by contact, and that this was due to light so reaching the edges of the plates that it could get underneath them by internal reflection.

Mr. FERRERO avoided this by printing at the bottom of an open box, so that, practically speaking, none but parallel rays could reach the negative.

Mr. W. WILLIS stated that Mr. Humphery, when exposing by means of a lantern, obtained a positive in half an hour, and in another case by an hour's exposure obtained a reversal.

Mr. ASBURY GREENE had tried to get alternating reversals by increasing the times of exposure, and had not succeeded.

Mr. GALE had once been photographing the interior of a church tower; through the open door a landscape was visible; the interior developed in the normal way, whilst the landscape gave a positive image upon the same plate.

Mr. CLARK had known the extra amount of light let in by the accidental opening of the developing room door to reverse an image. Was it possible that a certain vividness or intensity of light was necessary to get reversed images at all? It was worth trying by experiment.

Mr. HUMPHERY said that when he told a lady that he was

* Mr. Frewing has long been producing reversed negatives in this way for commercial purposes.—ED.

getting reversed photographic images, she asked whether the back of the head of the sitter came out instead of the face? When he explained the facts she thought him "no great shakes!" The whole secret of success in the method lay in reducing the developer to one-eighth the normal strength. He used no bromide, so did not know what might be its influence.

The Chairman had been trying an old process described by Hunt, in which paper was prepared with sulphate of copper and bichromate of potash, then dried and placed under a negative; but had never been able to get the reversal spoken of by Hunt, who had written that under such circumstances short action of light gave a negative, and long action a positive.

Mr. W. Willis remarked that if the solutions used by the chairman had been made acid with sulphuric acid, he would probably have obtained the white ground spoken of by Hunt; he could not, however, say anything about any reversal.

On Thursday, November 6th, Mr. J. Gale will read a paper entitled "Country Rambles with a Camera." The paper will be illustrated by lantern slides.

The London and Provincial Photographic Association.

October 23rd.—Mr. C. H. Cooke in the chair.

Mr. G. W. Atkins, referring to the discussion at the previous meeting on stereoscopic photography, said that a photograph taken with two cameras rather wide apart would show the immediate foreground greatly exaggerated; he attributed this to the use of short-focus lenses.

Mr. W. E. Debenham said the length of focus of a lens was not responsible for exaggeration of perspective; the use of a wide-angle lens might produce it, but only then when the photograph was viewed at a greater distance than the length of the focus of the lens employed. This he illustrated by means of diagrams on the blackboard.

Mr. W. E. Woodbury exhibited examples of celerotype prints, a gelatino-chloride printing process recently introduced by an English firm. Enumerating the advantages of this paper, he said it was twice as sensitive as albumenised paper, and gave brilliant images. It was necessary to print deeper than required to allow for reduction. By varying the toning bath a range of tone was available for selection according to the taste of the operator. He believed the paper to be permanent from the fact of the sensitive film being on the surface of the paper, and the soluble salts easily removed: a substratum of pink chalk was used. Mr. Woodbury stated that a new mountant would shortly be introduced into the market that would not dull the gloss of prints stripped from glass.

Mr. F. A. Bridge had tried the paper. It curled very much when immersed in the toning bath.

Mr. Woodbury said that the paper was tougher than others of its kind, and he found it very easy to work. It was especially suitable for thin negatives.

Mr. T. E. Freshwater showed some bromide prints, directing attention to one, the Paul Pinder, Bishopsgate Street, which he had taken a few days previous to its being pulled down. He also passed round the current issue of *Fun*, containing a skit on a recent photographic county court action.

Photographers' Benevolent Association.

A very pleasing combined lantern and musical entertainment was given, under the direction of Mr. F. A. Bridge, in the large hall of Auderton's Hotel, Fleet Street, on Friday evening, 24th inst., in aid of the funds of this Association. Lantern slides were contributed by Messrs. T. Charters White, J. B. B. Wellingtou, F. P. Cembrano, Atkinson, Ackland, Scrivenor, Bridge, Freshwater, Dando, Birt Acres, T. Guardia, J. Carpenter, S. T. Chang, and H. M. Hastings. The visitors completely filled the room, and included the Chinese Ambassador and suite, besides the officers of the Society. Mr. J. Traill Taylor explained the objects of the charity, its need of help, and, with music interspersed at intervals, a good entertainment was provided, which appeared to give general satisfaction. Mr. R. Beard undertook the management of the optical lantern.

West London Photographic Society.

An ordinary meeting took place on October 24th at the Broadway. Mr. C. Bilton (the retiring president) introduced Mr. Walter Adam Brown, who had been elected to fill the office for the year 1890-91. A vote of thanks was passed to Mr. Bilton for his services during the past year.

Mr. Wm. Schooling, F.R.A.S., was elected a member.

In answer to a question as to the best means of reducing a negative which had been over-intensified with mercury, Mr. Whiting said that Howard Farmer's reducing solution, composed of ferri-cyanide of potassium and hypo, would generally be found to answer well, but in the case of a yellow negative he preferred to use ozone bleach.

Mr. W. A. Brown, in the course of his inaugural address, said that it seemed to him that photography was purely in its infancy, notwithstanding the vast improvements which had been made since its discovery, both in the direction of *technique* and of art, and no one could prophesy the changes which might occur even during the short period of their own lives. Much remains to be discovered. In regard to landscape work, the photographer was brought face to face with the serious drawback that, however successful in other respects the photograph might be, it always lacked colour. Skies also were difficult to obtain in the same negative, and the relative values of distances were often misrepresented. It was one thing to see a pretty composition on the screen, and quite another to produce the same result in the photograph. Although he spoke with an indifferent knowledge of the subject, he did not think natural colours would ever be produced in the negative; but in regard to the true rendering of skies, the present difficulties would be overcome. Speaking of the manipulation of the plate, he thought very considerable art might be exhibited in its development. A very great amount of art was necessary in selecting the picture and arranging it on the plate, for they must not forget that they could not manipulate a foreground like a painter; they must take nature as they found it, or leave it alone. Many a good picture was spoilt by bad development, and in the same way many a badly exposed plate could be saved by skilful treatment. When it came to the after operations of washing, &c., the work was mere drudgery. In the first handbook he had read, it was stated that washing by hand was the most effectual method, and recommended that twenty changes of water should be given, with an interval of ten minutes between each change. Those who were fond of figures would find that that was a very protracted operation, and, to a busy man, a great waste of time. Although print and negative washers existed in every conceivable variety, it seemed to him that the washing itself might be obviated, and that the same chemical aid which introduced the hypo might be invoked to eject it in the same summary manner. Speaking of the photographer rather than of the materials, he could not help noticing the large number of people who took out six plates, and were not happy unless they shot them all off before returning. That should be altered. Comparing the photographer with the painter, the latter did not try to paint everything he came across; he selected his subject. The same principle should guide the photographer. Another fault with amateurs was the incessant craving after novelties. Before a particular make of plate was mastered it was discarded and a fresh brand chosen—it was the same with shutters, lenses, and other things. He would impress upon them the many advantages to be derived from joining a society, and he congratulated them upon the good position to which their own had attained. In conclusion, he thought it would be a great boon to their own and other societies, if they could combine together in the same way as angling societies had done, and obtain the privilege of getting railway tickets issued to them at reduced rates.

The optical lantern, under the superintendence of Mr. Horton, was then put in operation, and a large number of slides exhibited. A fine series in wet collodion, by Mr. C. Whiting, of Shakespeare's birthplace and the neighbourhood of Stratford-on-Avon, was much admired. Messrs. Wilson, Dixon, Lamley, Livingstone, Kellow, Hodges, and Winter also showed slides,

an interesting evening was brought to a close by the exhibition of some fine slides lent by Messrs. Fry and Co.

At the next meeting, November 14th, Mr. Jones will give a demonstration on printing in platinum.

Hackney Photographic Society.

The ordinary meeting was held on Thursday last at Morley Hall; Dr. Roland Smith presided.

Several pleasiug results of the Fry Manufacturing Company's samples were handed round, and, from the fact that one or two shown were the work of tyros, good results would appear to be easy to arrive at.

Mr. John Howson then gave a lecture and demonstration on "Alpha Paper Printing and Developing." Many people had said that half-tones were lost with this paper, but the productions shown (the work of a prominent professional) proved that this was not so. The emulsion on paper and plates was precisely the saue, and any colour could be obtained in the toning bath. Exposure should be made by scale, and not by guesswork. The burner to be used was an Argaud two-light at a distance of ten inches, the exposures taken as experiments to be one minute, one and a-quarter minute, and one and a-half minute. The demonstration then took place. After developing, the prints were placed in an acid bath and passed afterwards through three washing waters, and then toned and fixed in a combined bath such as used for aristotype papers. The resulting tone can be modified by stopping at the one desired, taking out the print or plate and merely washing. The results demonstrated were from a red to a platinotype colour, the blue or final colour taking about twenty-five minutes. Various lantern plates were shown illustrative of the tones obtained by the process.

Mr. Beckett showed a print on Alpha paper which had had over twenty minutes' exposure, being an enlargement from a quarter-plate.

Mr. Howson said, in answer to the Secretary, that they had some paper three years old which was still being used.

The Lantern Society.

The first meeting of the season was held at 20, Hanover Square, on October 13th, when Mr. Andrew Pringle gave an address on "The Modern Applications and Appliances of the Lantern."

After briefly alluding to the early history of the lantern, the lecturer proceeded to consider the various parts of a lantern, taking in order the body, where he dwelt on the advantage of portability, showing a small iron lantern which, whilst capable of doing all that a lantern of ordinary construction would do, packed, with all its parts complete, into a box a quarter the size of an ordinary one; the condenser, describing the various forms which have been designed and used at different times; the lens, comparing the ordinary "lantern objective" with portrait and other types of lenses: and the luminant, describing the early form of limelight as designed by Drummond and Beechey, and going into the essentials of a good lime jet; also showing a Brockie inclined arc lamp for use with the lantern. He then went on to discuss the uses and advantages of the lantern from an educational and scientific point, and showed several experiments on the screen with a projection mieroscope. The screen used by the lecturer was a portable one designed by himself, with the view of its being made as handy as possible for travelling.

Amongst other things, Mr. Pringle showed a scientific bi-unial, designed for showing diagrams on the screen before a class, and a projection microscope of a most simple construction designed by himself. Several pieces of lantern apparatus were exhibited, amongst them being a lantern constructed by Mr. J. H. Steward, for using an incandescent lamp of 100 candle power.

Birmingham Photographic Society.

An ordinary meeting was held on the 23rd inst. at the Club Rooms, Colonnade Hotel, the president, Mr. J. B. Stone, J.P., F.G.S., in the chair.

A vote of thanks was passed to Mr. Harold Baker for a set of slides he had presented to the Society.

Mr. Taylor exhibited a metal binder for slides, made by a London firm.

Mr. Jaques saw two or three objections to their use. In the first place, they would let the dust in; in the second place, the metal would have a tendency to scratch the glass; and in the third place, it added weight to the slides. Paper binding could easily be made with gelatine and sugar mixed with water.

Mr. Tucker said that if they were made of iron or steel they would be subject to rapid corrosion.

Mr. J. B. Stone said that it gave him pleasure to call on Mr. Place to put the different slides through the new lantern, which had been subscribed and paid for by the members without touching the Club's funds.

Mr. W. J. Harrison, F.G.S., said that Mr. Place had so admirably made it that it was the best in England, and therefore the best in the world.

Mr. J. B. Stone's slides were first passed through from pictures he had taken while on tour with the Vesey Club in Norway. Slides were also shown by Messsrs. Owen, Thomason, Titley, Underwood, Harrison, Palethorpe, Jaques (illustrating a nursery story from a toy book), Baxter, Pickard, and Leeson, and also about forty sent by Messrs. Mawson and Swan.

Mr. Stone offered twenty-five of his 15 by 12 negatives of Warwickshire to the Survey Council, and prints from each in platinotype.

The Photographic Society of Ireland.

A special general meeting was held on the 23rd inst. at the Rooms, 15, Dawson Street, Dublin, Professor J. Alfred Scott, M.B., in the chair.

After authorising the addition of the rule that any person elected a member during the last three months of the year should not be liable to a further subscription in the following January, and also to authorise the treasurer to remit the entrance fee to all elected members from that date until the 31st January, the meeting was resolved into an ordinary one.

Mr. M. Hedley exhibited and explained Hunter's fuming box; he also passed round specimens of Fry's bromide paper enlargements made from hand-camera negatives.

Mr. J. H. Woodworth exhibited and explained some stereoscopic transpareneies made on celluloid films.

Dr. E. McDowell Cosgrave having taken the chair, Professor Scott proceeded to give his demonstration on making photo-micrographs. He said that in 1883 he devised a small camera intended to fit on the top of his mieroscope, where it could be placed if anything notable were observed in the field. The plates were small, being $2\frac{1}{2}$ by $1\frac{3}{8}$—much too small for useful lantern slides. The camera used for all his subsequent work was practically the same camera, but elongated about fifteen inches. This gave a picture about three inches square, yet was sufficiently short to allow working all the microscope adjustments while focussing the object. For convenience and steadiness, the camera was arranged parallel with the table instead of being placed on the microscope and regardless of the position of the latter. At the outset, he desired to disclaim any idea in connection with the slides that he would presently put upon the screen other than that of lecture diagrams. In many cases detail was deliberately suppressed, and in some appearances exaggerated, to make the remainder more diagrammatic, but there was nothing more done than would be allowed in the staining and mounting of the specimens had they been specially prepared with the intention of taking photographs from them. Some which were wanted with that intent were so stained as only to exhibit the particular point wished to be shown. The actual photographic work was in most cases easy, the ordinary methods being employed; in other cases, however, the special isochromatic plates were necessary, on account of the stain employed in mounting the sections. With the modern lenses which were used, everything depended on the angle of light—the greater the angle of light, the more was to be seen. There were some objects which were not to be seen at all; the microscope would not show them unless the light passed into it at an angle; in this case a special condenser was used to give the

light at the necessary angle. Professor Scott described his method of focussing, which was done on a piece of glass coated with a solution of gelatine with which a little milk had been mixed, and said that for a second and finer focussing he could implicitly recommend a piece of clear glass on which some lines had been scratched with a diamond about a quarter of an inch apart, such lines not interfering in the slightest with the object focussed. With regard to the illumination of the object, he found an ordinary paraffin lamp amply sufficient for low powers, but in order to concentrate the light for high powers he recommended the use of an ordinary bulls'-eye. Professor Scott then illustrated his remarks by taking a photograph of the section of the eye of a house-fly, and, having given it six minutes' exposure, retired to the dark room with a number of the members and proceeded to develop the negative, which was then passed round and greatly admired.

A number of microscopic transparencies was then put through the lantern by Professor Scott, and a discussion followed.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE first monthly meeting for the season was held in the Rooms, 180, West Regent Street, on the 20th October. Twenty-four new members were elected.

A paper on "Hand-Camera Work," by Mr. JOHN MORISON, Junr., was of special interest, and after an exhibition of novelties, the lantern was brought into requisition for slides from hand-camera work, and pictures were shown on the screen, as also some amusing studies.

THE CLUB OF AMATEUR PHOTOGRAPHERS OF VIENNA.

IN Vienna photography may be said to have begun its winter session, for both the Photographic Society and the Club of Amateur Photographers have held their first meetings. That of the latter, presided over by Mr. Charles Srna, president, on the 11th inst., offered various points of interest. Among others, we may mention the vote of thanks given to Mr. Ulrich for the trouble he took in calling the attention of English photographic circles and journals to the exhibition to be held here in the spring. The Baron Nathaniel Rothschild's pictures were deservedly admired on account of their artistic merit. As at the meeting of the Society, so here Mr. Einsle spoke of his process for the intensification and partial reduction of negatives while under development. Mr. Lewitzki exhibited some interesting magnesium flash-light pictures representing scenes from "The Czar Boris," a drama of Tolstoy's. A French developer, called "Crystalos," was spoken of by Dr. Hoffmann.

NELSON (NEW ZEALAND) CAMERA CLUB.

THE second annual meeting of the Club was held on 26th June, Mr. FELL, president, in the chair.

The SECRETARY gave a resumé of the year's work. Reference was made to the satisfactory attendance at the monthly meetings, the success attending the exhibition held in February, and the number of photographs contributed to the Club portfolio. The accounts showed that the Club was in a satisfactory financial condition. The introduction of special subject competitions on each evening had increased the interest of the members in the work of the Club.

For the ensuing year the following officers were elected :—*Patron*—H. E. the Governor ; *President*—Charles G. Fell ; *Secretary*—F. W. MacLean.

The subjects arranged for each meeting have been:—July—Old Building in Nelson ; August—General View of Nelson ; September—Interior (flash or otherwise) ; October—Snow Scene ; November—Animal Study ; December—Cut Flowers ; January—Object in Motion ; February—Marine View ; March—Life Subject (figures, portrait or nude) ; April—Forest Scene ; May—Clouds ; June—Enlargement.

THE Photographic Section of the Imperial Technical Society in Russia has decided to organise an exhibition of apparatus and photographs of a strictly academical type, to be opened during Lent, 1891.

Answers to Correspondents.

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

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

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

D. J. S.—*Portraits with White Background.* We were under the impression that the days of white sheet for background had passed and gone, but your letter is confirmed in every particular ; and, having seen the said photographs, we adhere to the opinion that they would have looked better if the contrast had been less violent. There is, however, no difficulty in producing such results, if desired. Those we saw were full-length portraits of actors taken in London, and not foreign specimens.

W. G.—*Platinum Toning.* Although the price of platinum has gone up nearly to that of gold, its use cannot be dispensed with if you wish to obtain the sepia tones, such as those now represented by numerous examples in the Photographic Exhibition.

L. E. M.—*The Cylindrograph.* The exposure is not managed in the way you suggest, but the lever arm carrying the lens is moved through an arc of nearly half a circle backwards and forwards several times, so that inequalities are practically neutralised, and are not apparent in any of the specimens shown. There is some truth in your criticism about the bent lines in perspective.

T. F.—"*An Invitation to Supper.*" With a general verdict in its favour, it seems unfortunate that a medal could not be awarded, but the regulations must be adhered to, and the Crystal Palace show is made responsible for withholding it on the present occasion. The picture is certainly very good, and the fact that the judges agreed in recommending it is proof of their coinciding in your opinion. The same four figures, differently posed, are made to do duty several times in the procession. See the letter in last week's NEWS, which answers your other enquiry.

A. B.—*Hand-Cameras.* The season being so far advanced, it would perhaps be wise to delay making a purchase until next spring ; but if a choice is now to be made, a good selection can be seen at Pall Mall, and the chief features of these were described at the technical meeting on Tuesday last.

B. N.—*Kallitype.* The patentees have written to say that we have given you the *old* formula, and that the process works better with sundry alterations which they have recently introduced ; the chief of these being the use of 1 ounce of citrate of soda, instead of 800 grains, in the developer, and the first washing solution is to contain this salt of same strength (2 oz. per pint) *without* any addition of nitric acid.

COL. WATERHOUSE.—Received your letter, and we shall have much pleasure in attending to your request.

G. S. B.—*Swan Watermark in Paper.* Our correspondent wishes to identify a photographic paper having a swan as watermark. Can any of our readers help us by giving the name of the maker ?

S. and W.—*Triplicate Portraits.* If you search the NEWS of April and May last (this column), you will find several references to methods of accomplishing this task, three poses on one plate. They are, of course, somewhat difficult of execution. You are working in imitation of Vandyke's portrait of Charles I., which, if we mistake not, is to be seen at Warwick Castle.

LINDO.—*Celluloid Films.* To keep them under pressure in the dark slide, Mr. England suggested, at a technical meeting of the Parent Society, that a slightly curved rabbet should be inserted into the carrier, but not bent enough to throw the sensitive surface appreciably out of focus.

F. M.—*Copying Apparatus for Lantern Slides.* Messrs. Marion and Co. recently showed a convenient form of apparatus at the Drapers' Hall Exhibitions, and now Mr. A. R. Dresser has a copying table for lantern slide making in the Pall Mall Exhibition.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

PRINTING NEWSPAPERS BY PHOTOGRAPHY.

THE printing of newspapers by photography now seems to be coming within measurable distance. Before the Bath Photographic Society, as will be seen in another column, a machine—the joint invention of Mr. Frederick Varley and Mr. Friese Greene—has just been exhibited, by means of which machine positives from one negative have been turned out at the rate, it is stated, of three a second. This means 10,800 per hour, exclusive of the developing, washing, fixing, and drying operations, which, by means of suitable baths and mechanical appliances, need not take long. One picture turned out by the machine was of half-plate size, and slightly overdone in the high lights, which is a defect easily remedied; in other respects, nearly all the prints on the long band were good. A long roll of highly sensitive bromide paper had been used. As the matter now stands, while only a few hundred pictures have been turned out by the machine in early rough-and-ready experiments, it seems likely that it will have an important bearing on book-illustration. It would be something quite novel for a publisher to take a negative to a commercial firm, and in an hour or two to receive 10,000 dried and cut prints from it ready for binding.

As regards producing entire newspapers in this way, the suggestion has been made that the articles can be given in the handwriting of the authors. A more painful infliction upon the public can scarcely be conceived, as newspaper editors know. Some specimens of handwriting are as easy to read as Egyptian hieroglyphics. In any case, the invention does not seem likely to interfere with compositors' work; but a printed proof can quickly be photographed, and the negative used in connection with the printing operations.

For newspaper printing, silver salts would be too expensive. Mr. Friese Greene told us last Monday night that he has long been searching for a quick process with other salts, and had only succeeded that morning. He exposed, for about half a second, a sensitised card, in our presence, under a negative at a distance of about four inches from an ordinary fish-tail gas flame, then put it in a developer in which the print came up as rapidly, and in the same manner, as in the gelatino-bromide dry plate process; then he washed and fixed it. He did not inform us what chemicals he used, but assured us that there was no silver in them, and that an inexpensive salt was the agent sensitive to light.

Possibly before long a great demand for the services of photographers may arise in printing offices.

THE DIAZOTYPE PROCESS.

LAST Monday night Messrs. Green, Cross, and Bevan brought their new diazotype process under the notice of the Society of Chemical Industry at Burlington House, and gave some information on the subject in advance of that previously published.

Mr. Green read the paper, in the course of which he said that primuline and all other amido compounds are turned into diazo compounds by the action of nitrous acid, and are then, all of them, more or less sensitive to light. He demonstrated the process to the Society, and developed prints of several different colours; one of them, not previously publicly exhibited, was of a vivid dark blue; the developing agent in this case was amidobetanapthol sulphonic acid. A green remains to be obtained by the diazotype process, and then by its means all the colours of the spectrum can be typically represented at will.

Supposing a picture—say a landscape—to be printed by the diazotype process, and supposing a developer to produce green to be discovered, it will be possible, by locally painting upon the faint image by means of a brush, to bring out the whole picture in somewhat the colours of nature; the colours will usually be more gorgeous, and there is no means of modifying them, except in instances in which two of the developers can be mixed. The brush work must be neatly done, because, should it extend beyond the edges of the leaves or other parts of the picture being treated, the part of the background touched will come out of the same colour as that which the developer produces, but more or less strongly, according to the relative intensity of the previous action of the light. Mr. Green expressed the belief that the colours produced were faster upon gelatine than upon cotton, and that they were

more unstable when produced by a weak developer instead of a strong one. He also stated that several persons are trying the value of the diazotised compounds in orthochromatic work with gelatino-bromide photographs, Mr. David Howard having put the question whether anyone were working in this direction.

In the course of the discussion, Dr. Boureart stated that, on the Continent, he had seen the action of the diazosulphonic bases on the phenols utilised to produce colours upon fabrics when exposed to light; the light itself brought out the colours. Those who were using the process did not tell him exactly what chemicals were employed. He had found that the rays of the sun would destroy the pink colour of eosine in one hundred and ten minutes, and that quinoline blue was more fugitive still under the action of light.

PASTELS AND PHOTOGRAPHY.

THERE are many reasons why photographers should take an interest in the revived art of pastel painting, and why they should not lose the opportunity of visiting the Exhibition of the Society of British Pastellists, which remains open at the Grosvenor Gallery for the whole of this month. For a long time photographers have depended more or less upon the use of chalk and stump for finishing enlarged portraits, and we see no reason why, in the near future, a new branch of art should not arise in which coloured chalks or pastels should be employed for working upon a photographic base. The universal use of bromide paper as a medium for obtaining quickly and with certainty large pictures from small negatives, itself constitutes a new industry of no small dimensions; and, certainly, no better foundation for a pastel picture could be imagined than such a surface, which, by treatment with pumice or other roughening agent, has been made receptive of the soft chalk.

At the Exhibition referred to, the photographer of artistic tastes—and he can hardly be called a photographer unless he can claim a right to be so described—will see much to admire. He can study the simple means by which certain effects can be rapidly executed, and enjoy the great range of colour at an artist's disposal when he employs pastels to express his ideas.

For effects of aërial perspective, the dry medium runs water colours very close indeed, while for flesh tints it is indeed hard to beat. He will, on the other hand, see much which he will do well to avoid. At all modern picture galleries in these days, when it is the fashion among certain new schools of art to set aside old traditions, and to pooh-pooh! the works of those who have hitherto been regarded as masters of their craft, mannerisms of the most absurd type obtrude themselves, and one is continually tempted to enquire whether this or that work has been executed by an inmate of Bedlam, or whether its presence is to be regarded as a huge joke. The present pastel exhibitors evidently have among their body many "cranks," as our American cousins would call them, and it would seem as if these members had tried their hardest to produce the most outlandish results. Mr. Furniss's "Artistic Joke"—as he called his skit on the Royal Academy's Exhibition which was open in Bond Street a couple of years back—contained nothing of such a burlesque character as some of these Grosvenor Gallery pastels, which are grotesque and ludicrous, the more so, perhaps, because they are intended to represent something very different. If likeness to nature be really an attribute of art, the humble worker in coloured chalks upon our pavements, with his crude attempts at sunset and moonlight effects, is nearer the goal than some of these pastellists. But it is not our purpose to review in detail the works hung at the Grosvenor Gallery. As we have already indicated, there are many most excellent pictures there, which, perhaps, gain rather than lose by the presence of those which are only remarkable by reason of their eccentricity and utter unlikeness to anything in the realm of nature. Those who visit the Gallery will quickly see from which pictures they can gain a knowledge which shall be of future use to them in their photographic work.

Bromide paper is not the only medium which may be made suitable for working upon with coloured crayons. There is just now a craze among photographers for printing paper which is not only provided with a dull matt surface, but has, in addition, a coarse grain, as may be seen by a glance round the walls of the present exhibition in Pall Mall. It is easy enough to salt and sensitise any description of rough drawing-paper—and nothing could be better as a basis for pastel work—for the necessary grain is not destroyed in the sensitising process, which merely consists of the application of silver solution with a soft brush or sponge. So that the worker is in the same position as a pastellist who is commencing a picture on blank paper, with the farther advantage that the image has been already sketched out for him by the action of light. In working, too, on such a basis, the artist will be able to cover over any portions of the photograph which it may be needful to eliminate, to subdue portions which are too obtrusive, and to bring into greater prominence outlines which, by halation or other accident, are indistinct, for the colours with which he works are, of necessity, of an opaque character; and it is well that they should be so, for the photograph, as such, must disappear, and the pastel work must take its place. The picture underneath must be regarded as a mere sketch—a guide for the crayon—and it is only as such that we recommend this wedding between two distinct branches of art.

That some of the pastellists would do well to use photography as a basis for their work will be evident from what has already been pointed out, although they will doubtless regard the suggestion as being somewhat uncomplimentary and uncalled-for. But a man challenges criticism when he publicly exhibits his work, and if he apparently strives to impress the public with the notion that he holds all the common rules of drawing in contempt, he cannot complain if we point out a remedy for his shortcomings. Both photographers and

pastellists who are inclined to adopt our suggestion that one art should help the other, would do well to bear in mind that they are working in a medium which is capable of certain effects. They must not strive to do with the chalks that which is beyond their province. At the Pastel Exhibition, there are far too many attempts to make the pictures look like works in oil or water-colour, and the result is invariably a failure.

THE BY-WAYS OF PHOTOGRAPHY.

Much has been written, and with truth, about the rapid and extensive "strides" made by photography in what may be called the highways of the world. By the aid of photography, this art or science, or both—the matter is not yet determined—almost all arts and sciences have been more or less benefited. It is connected more or less with archæology, geology, histology, meteorology, and zoology. It plays a prominent part in geography, botany, astronomy, and architecture. The use of the camera is not unknown to the professors of medicine and of jurisprudence. It investigates the heights of the starry heavens, and the bottom of the deep, blue sea; it traces the paths of the lightning flash, the falling water-drop, and the flying bird; it delineates the waves of the human voice, and prints on paper the motions of the galloping horse and the hurtling cannon ball. Dr. Eder has given us the image on the retina of a beetle, and Dr. H. W. Vogel has shown how the velocity of the earth in its orbit can be calculated by the variation in the displacement of the lines in the spectra of different stars.

All this and more has been done by the aid of photography, and all this and more is fairly well known by every amateur and professional who has laboured in its ample field; but it is not, perhaps, every one of them who has marked the humbler, the more secluded, paths of interest and utility—the by-ways of progress as yet virgin and untrodden by the foot of the photographic artist. It has not yet, perhaps, been sufficiently explained how far this artist has his moral and religious use, and how his practical services for the world may still be widened more and more.

"I am not only witty myself," says Falstaff in the second part of Henry IV., "I am not only witty myself, but the cause that wit is in other men." So the photographer may say, "I am not only clean myself, always excepting the chemical stains incidental to my craft, but the cause that cleanliness is in others;" and thus, seeing that cleanliness is next to godliness, the photographer may, in some sort, be regarded as a religious reformer of mankind. Some little time back it was remarked that if sitters were to wash their faces immediately previous to having a large photograph taken, there would be less labour for retouchers, and a better picture would be the result. This, at the first glance, seems to be an injurious reflection upon the sitters, who seldom fail, as any photographer will be ready to testify, to make themselves as spruce and clean as circumstances will allow. But the purity required by the photographer is of a superlative kind. The face must be washed—so rapid, alas! is the accumulation of dirt—the instant before it is placed opposite the camera. The lens is a keen detective of dust; it can discover foreign matter in crevices almost imperceptible as clearly as the microscope reveals coarseness in the finest cambric. But it has been urged that it would be a hazardous undertaking for a photographer to ask a sitter—let us say a lady who has spent several hours previous to her visit in the manipulation of her hair, her eyebrows, her cheeks, her lips, and other features, a retouching, as it were, of her natural countenance before the subsequent retouching of her artistic picture—to undo a work of skill, and time, and labour; in a word, to wash her face. No; a better plan would be to expose two plates in the studio, one with the hard lines of a face not washed immediately before being taken, the other the soft picture of a smiling beauty, who, in addition to being smiling, is also superlatively clean.

The photographer may lay claim to the character of a religious reformer; he is also a moral guide. Consider, for example, the indecency of drunkenness. The photographer takes several pictures of ladies and gentlemen in their inebriated habit as they stood—or, to speak more exactly, tried to stand. He exhibits them with all their imperfections on their heads and elsewhere; he presents a stern *fac simile* of the limp and listless hand, the uncertain leg, the fishy, tearful eye, the rumpled hair, the disarranged attire of the incapable and the drunk. By the side of these portraits he places others of the same ladies and gentlemen when sober, with all the graces of the human face divine, and possibly the additional embellishments of art. Other weaknesses of our frail and common human nature he treats after the same fashion: the fiery fury of rage is contrasted with the placid demeanour of repose, the ugly scowl of envy with the humility of content. Then will that photographer admit the public into his ethical gallery and give his object lesson to the world. "Look here," we hear him saying with Hamlet, "upon this picture and on this—two counterfeit presentments of the same person under different conditions, under the opposed dominations of good and evil. See what a grace is seated on this brow (and so on), and then look at the companion picture, like a mildewed ear blasting his wholesome brother," and so on. Or if that photographer be of a mercurial disposition, he will content himself, and possibly his audience, with imitating the pose of Serpolette in *Les Cloches*, and echo the familiar refrain, "Just look at this, and look at that." Such contrasted pictures would do yeoman's service in some of our reformatories, in which one photograph might represent the child as it appeared on its admission from the gutters and the streets, the other the adolescent youth ready to figure in the world as a reformed character and an honourable member of the common weal. Things let down into the ears, says the Latin satiric poet, affect the mind more sluggishly than those which are submitted to the faithful eyes. And pictures of this character would probably produce

on the lately admitted neophyte a greater impression than the inaugural lecture, of which, commonly, only one-half is understood, and that half very quickly forgotten.

In addition to the religious and moral uses of photography, there are several practical uses thereof in life's daily round which have been from time to time suggested, and need only a bold heart and a liberal hand for their development. In the way of advertisement, the use of photographic pictures might be very much extended. It is only lately that the ingenious idea of ornamenting the blank spaces above the cushioned seats in some of our first-class railway carriages with excellent and permanent pictures of places of interest in Great Britain has been imperfectly carried into act. Such photographs combine amusement with instruction. They are also supplementary advantages in giving the nervous passenger someting interesting to gaze upon, withdrawing his attention from the people opposite, who are not always grateful for the prolonged inspection of their personal appearance, and occupying his mind with thoughts of a less unpleasant nature than the sudden smashing of the carriage, and all contained in it. Many articles of domestic utility, such as soap and candles, handerkerchiefs and umbrellas, might be adorned by photographs with pleasure and with profit. Then a missing umbrella might return to its right owner, as conscience money to the Chancellor of the Exchequer. The heart of that temporary proprietor would be stony indeed which could withstand the suppliant or minatory look of its original lord imprinted upon its handle. An additional security, much wanted, would be afforded to railway companies by the photograph upon a season ticket of its lawful possessor. Some Continental companies have long adopted this notion to prevent season tickets being passed round the family circle as occasion requires. Additional interest would be conferred upon a visiting card after the same fashion. "What's in a name?" asks an ancient literary riddle. Not a quarter so much, is the correct reply, as in a photograph. The very term, *carte-de-visite*, was—as, of course, everybody is aware—originally adopted from the pleasing idea which it is proposed to revive. Photographs of houses are already commonly appended to descriptions of estates for lease or sale. It is high time to hope that the next newspaper information about the sea-serpent will contain a portrait of that interesting beast taken by a snap-shot from a Kodak.

Another incidental and subsidiary use of photography has been lately suggested. The reader is, probably, well aware of a mercantile device commonly adopted by the enterprising grocer who begins a new trade in some of the humblest of our suburban thoroughfares. "Here," he advertises on his inaugural Saturday night, "here every customer who purchases one pound of our finest Kowchee at one shilling per pound will be presented, in addition, with a really good sugar basin, or a milk jug of superior cut glass for nothing!" This generous offer, which alone is sufficient to cover with shame and confusion the face of such carping folk as impudently accuse our British tradesmen of grasping greed, might, it has been said, be changed into the offer of a cabinet photograph of the customer who bought the Kowchee, and the change has much to recommend it. Glass milk jugs and china sugar-basins are, alas! fragile, and likely soon to suffer fracture from the exigencies of domestic use, but the permanent cabinet will endure in its original glory to remind the purchaser and his family of the grocer's generosity, and then, if gratitude be anything more than a name, he and his children's children will continue to purchase from that good grocer, his heirs, and assigns, that finest Kowchee till their lives' end.

Hardly legitimate, perhaps, are some of these excursions into the by-ways of photographic art, but the world at large will possibly be found perfectly willing to walk in them. Already an ingenious example of photographic enterprise and endeavour has been shown in the writing, presumably for a reward, the word "prize" 10,858 times on the back of a common post card, and then getting the result photographed. A painstaking person, some time back, actually sent such a sample of laborious industry to the PHOTOGRAPHIC NEWS. Why the word prize should have been considered by this scribe worthy of so much manual energy was not, indeed, made clear. Possibly he lived in the hope continually set before him by his writing of some ideal gain. "We have not," said the editor on this occasion, with an equal amount of humour and conscientiousness, "we have not yet read this composition through, but it appears to be extremely interesting." And if all other by-ways be already blocked up, there is, at all events, one little lane into which the weary photographer at last may turn. When customers' visits become, like the visits of angels, as Blair says in his *Grave*, "short and far between," when the tricks of the trade are exhausted, when advertisement awakes no echo, and all else fails, some advantage may yet be found, if not in photography itself, at least in the little crystal-covered attic in which its votary was wont, in happier days, to practise it. There he may—a second Cincinnatus or Mr. Bashford—grow lettuces, and turnips, and radishes, and all sorts of green herbs, nay, grapes also, and tomatoes to his heart's content and to his purse's profit. Before Mr. Bashford became a millionaire from his market garden, he was nothing more than a humble and unsuccessful photographer.

A MUSKET bullet on one end of twenty feet of stout twine is handy to throw over and draw aside a branch that hangs in front of the lens.

PIZZIGHELLI'S DEVELOPER FOR LANTERN SLIDES.—A.—Dissolve 5 drachms of citric acid in 5 drachms of water, and neutralise with ammonia. Should too much ammonia be added, the excess may be driven off by gentle heat. Then add 3½ drachms of citric acid and make the solution up to 4¾ ounces. B.—A 1 to 3 ferrous sulphate solution slightly acidulated with sulphuric acid. C.—A 1 to 30 chloride of soda solution. This is a powerful restrainer, and should be used with care. Developer :—A, 10 parts ; B, 5 parts ; C, 1 part. A larger proportion of ferrous sulphate retards the development. Softer and less intense effects are produced by diluting the developer. Gallic acid acts as an accelerator, and produces sepia tones. Two and one-half parts of a one per cent. gallic acid solution is recommended.—*Revue Photographique.*

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

With an examination of the pictures on the screens, these notices come to an end. Here are hung some of the best reproductions of the Autotype Company, and of Bonssod, Valadon, and Co. We have also Mr. Fred Hollyer's admirable copies of oil paintings, which, for faithful rendering of the artist's style, so far as monochrome is capable, leave little to be desired. Particularly is this noticeable in regard to Mr. G. F. Watts. Mr. Friese Greene shows a number of enlargements of cloud pictures which, years ago, would have been wondered at. Cloud negatives are, however, now common enough. Mr. Friese Greene's bromide enlargement (No. 556) is an example of the difficulty a photographer has in finding a model who shall fulfil all artistic requirements. The face of the lady is fair enough, but her long, lank, angular arms remind one of the biting criticism applied to a photograph of Madame Sarah Bernhardt and her dog: "Picture of a dog and a *bone*," observed the mercilessly sarcastic critic. An artist, if he had been painting a portrait of the lady in question, would probably have put a little more flesh on her arms: it might not have been true to nature, but it would have been more pleasing. A critic of the naturalistic school would, now-a-day, find fault with the artist for joining the face of one person to the shoulders of another, finishing off with the hands and feet of a third, but there is plenty of justification for the practice. The poor photographer, unfortunately, cannot do this. He must take nature as it comes, and nature occasionally is very provoking.

The fact that No. 573 is a specimen of home portraiture does not add to its attractiveness. The girl who, in a somewhat unmeaning way, is holding a flower-pot containing a plant, is obviously leaning her head to steady it against the back of the chair. The photography is good, and I should think that the author (Mr. H. Schulters Young, M.A.) could do better work than he is here credited with. Mr. F. Whaley's "A Tale of the World" is excellent as regards the pose of the figures and expression; indeed, he has been very fortunate in the good-looking young fellow who is explaining the "use of the globes" for the edification of the youngster, but there is something bare about the surroundings. The background, in truth, is too suggestive of the studio. Mr. Ernest Beck has some pleasant work in "Whitby Harbour" (579) and "Turning the Corner" (580). The latter is quite in the school of Mr. F. Gale. Mr. W. Barry's portraits by artificial light (No. 587) are not remarkable. Mr. R. W. Robinson's small pictures on the screen are inferior to his larger work on the walls, and are not up to his level. Mr. S. T. Chang has some agreeable mementos of enjoyable summer trips in a series (601 to 606), and this quality lends them interest. They are unpretentious, and when the grouping has been attempted Mr. Chang has been fairly successful. Mr. Henry Sturmey's Norwegian pictures bear out the popular notion of that supposed chilly region; the photographs have a cold sparkle about them, which is suggestive, and possibly characteristic of the country. Mr. A. R. Dresser has been at work at the Zoo with a hand-camera, and the result is seen in No. 617. The photography is good, but the prints seem somewhat flat and pale. Would not the negatives yield better results than Mr. Dresser has given the Exhibition?

Mr. Lyddell Sawyer's "Making Friends" (No. 623) is a capital idea, and well worked out, but it is questionable whether vignetting is quite suited to the composition. We may suppose that the scene is in an English farm, but the young lady who wants to make the acquaintance of the cow seems to be standing in a sort of jungle. The ghostly cattle in the background have also an odd effect. The picture is good enough for further experiment to be tried with it in respect to printing. Mr. J. W. Holcombe shows a series of bits of Italian life in his "Italian Ideals" (No. 625), which are welcome for their freshness and unconventionality. They are just what a tourist photographer should aim at. Mr. A. Horsley Hinton, in his two pictures, "By Reedy Ways" (No. 626), and "Where swaying reeds eternal murmur made" (No. 577), has infused a poetic tinge which makes them very agreeable; and the same may be said of Mr. J. Milnan Brown's "Out with the Morning Tide" (No. 627). Mr. John Collier has a careful photograph of the interior of the Birmingham Fine Art Gallery (No. 633), which deserves mention. It is difficult to say much in praise of Mr. A. L. Hoper-Dixon's "Fortune Teller." The old gipsy is abominably ugly, and Mr. Hoper-Dixon, not contented with one picture of her, has given us three. One is not inclined to find fault with the woman's ugliness so much as with Mr. Hoper-Dixon's obtrusive method of treatment. Under other circumstances it is possible to conceive the old creature, hideous as she is, having a certain picturesqueness about her, but in these three pictures all the picturesqueness has disappeared. The effect is square and hard, without an atom of romance. Mr. H. Van der Weyde is always clever, and his picture, "A Jap. Scandal" (No. 641), representing the children of Mr. Mortimer Menpes, if less remarkable than the majority of his work, is interesting. Mr. Paul Lange is to be commended for his excellent views of Norway; they are capital in every respect. Mr. Bedford Lemere has identified himself with interior work, and his "Drawing, Dining, and Ball Rooms, Grosvenor Square and Grosvenor Place" (No. 652), are good representative pictures.

Mr. W. Woodhouse Fry cannot be warmly congratulated on his "Young Naturalists" (No. 653). The figures are far too scattered, and the idea Mr. Fry desires to convey is not very intelligible. One is at a loss to know whether the boy looking at the pool of water has caught a trout, a tiddlebat, or a tadpole. The "Young Naturalists" is of the class of "made" pictures in which the art is too apparent.

In taking leave of the Exhibition of 1890, one cannot help comparing first and last impressions. Repeated visits and examination of individual pictures do not remove the idea that the photography of this year is disappointing. Increased facilities have not had that influence which we had a right to expect. In figure subjects, indeed, there is a distinct falling off from the pictures of years ago. In landscape, the craze for cold tones has led to the exhibition in several cases of prints which, in the old times, would probably have been rejected. Not a few examples lead one to think that the notion in the minds of the exhibitors is that they have only got to label the print "Bromide," or "Platinotype," and it becomes worth looking at. Another fancy is that cold, inky tones are suitable for every subject, and the result is that pictures which would be pleasant enough in the warm tones of silver, grow uninteresting and almost repellent. In a word, the rage for pallid hues has been carried too far, and as, probably, in many cases the results are but experi-

ments, there is, if one may so term it, a flabbiness and uncertainty about the present exhibits which are characteristic of the experimental stage. We are, it would seem, in a transition period. The outcome, however, is not easy to discover, because the style of art affected by Mr. G. Davison and Mr. Lyonel Clark can only be regarded as individual faddism. If, indeed, these efforts be the forerunners of a "school," then the out-of-focus lenses hidden away in the pawnbroker's shop will be at a premium, and Messrs. Dallmeyer and Ross may as well commence their optical education again. A curious fact in connection with the present Exhibition, which may have its significance, is the lack of interest on the part of the public. It is an open secret that the visitors have fallen off, and, considering that the number of people who now practise photography has, during the last five years, increased at least ten-fold, the apathy is difficult to explain. One would think that the greater the number of persons interested in photography, the greater number would visit the Gallery for the purpose of getting a hint or two. But this does not seem to be the case. No doubt the exhibitors will be quite as much puzzled to find an explanation as are, doubtless, the council and officers of the Society. Still, the uncomfortable fact remains.

WIDE-ANGLE.

THE UNNATURALNESS OF "NATURALISTIC" FOCUSSING.*

BY W. E. DEBENHAM.

THE question of whether fine definition, generally called "sharpness," should exist throughout a photograph; or whether in the whole, or in great part, this definition should be replaced by blurring to a greater or less extent, is one that may be conveniently considered as divided into two parts.

The first division, suggested by the appropriation of the word "naturalistic" by the modern advocates of out-of-focus effects, consists of the enquiry as to whether this blurring represents more truly what the spectator sees than does a clearly defined photograph; and the second division includes the question as to whether it is, either generally or occasionally, desirable to introduce blurring, whether such introduction yields a truer representation of nature than a defined photograph or not. It is the first question that will be considered in the present paper.

I have used the expression "fine definition" in place of "sharpness" because, although photographers accept these as synonymous terms, the word "sharpness" has often been used in another sense by painters and draughtsmen; and therefore, in their sayings, may sometimes be found complaint of too great sharpness, which may naturally cause the photographer to yield to what he supposes to be condemnation from an authority which he recognises as artistically superior. The word "sharp" is often used, out of photography, to mean having strongly defined edges, and a photograph that is not sharp, in the photographic sense—of having fine definition—may be condemned artistically as excessively sharp if, from underexposure, too great intensity, deficiency of the connecting half-tones, or any other cause, the edges of prominent objects have a raw, crude, or harsh appearance.

The so-called "naturalistic" defence of blurred definition in all but one plane of the picture, I understand to proceed as follows:—The eye can only focus for one distance at a time, and if we look at any principal object, the more distant and nearer ones not being rendered distinctly on the retina, should be rendered with equal indistinctness in the picture, in order to convey to the mind the effect produced by the scene at the moment when we fix our gaze upon that which is considered to be the principal object, that alone remaining distinctly visible, whilst if more or less distant objects be now focussed, the principal one is out of focus.

To this argument it has been naturally replied that in looking at a scene that gratifies us, the eyes linger upon it, focussing, when required, objects in the different planes, and that if we would have a picture over which we may delight to linger too, we should be able at leisure to note the details as we would in the original scene. Beyond remarking that in this respect the work of painters generally will be found to support rather the advocates of fine definition than those of the blurring school, we will, for the moment, waive this argument, and come to the consideration of the question as to what is the sort of definition, as given by a lens, that will represent out-of-focus planes with the same amount of indistinctness that they have to the eye, when some particular object is focussed by it.

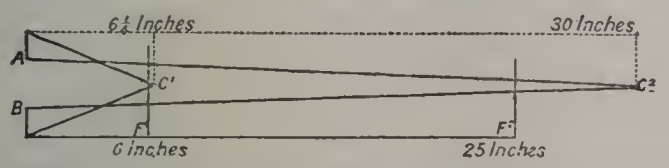
To fully understand this question, it is necessary that a fact should be grasped which is well known in scientific optics, but which I have found photographers slow to admit. That fact is, that the definition of out-of-focus planes is not dependent upon the proportion of the diaphragm or aperture to the focus of the lens, but upon the absolute size of the diaphragm itself, independent of the focal length. The argument against the naturalistic contention to be deduced from this fact has been applied to the case by Mr. W. K. Burton and Mr. J. Dennis Taylor. The latter writer has, in an article in the *Photographic Quarterly*, which has come to my notice since undertaking the present paper, given a mathematical demonstration of the optical fact referred to. It is to be regretted that Mr. Dennis Taylor's paper is not accessible in a more popular form than that of the comparatively new magazine in which it appears. As the demonstration which I have prepared is different from that of Mr. Dennis Taylor, I offer it to the meeting, that hearers may be convinced of the reality of the proposition. By equality of indistinctness it is meant that the blurring of any given point in the original shall extend to the same adjacent point in the cases to be compared.

Let A B represent an aperture of one inch used with lenses of 6-inch and 25-inch focus respectively, which focal distances are marked by lines at F^1 and F^2, and suppose an object to be focussed that is far distant—a church spire or mast of a ship two or three miles off, for instance—so that its focus shall lie as closely as can be discovered at F^1 for the 6 inch lens and F^2 for the 25 inch lens. Now suppose an object at a distance of 150 inches from the lens. This will be at a distance of $5 + 1$ foci from the 25-inch lens, and the conjugate focus of the object will therefore be $1 + \frac{1}{5}$ of $25 = 30$ inches. As the plate is fixed at 25 inches, the image of the near object will be out of focus by a distance 5 inches, or one-sixth of its focus. Each point, therefore, which would come to focus at C^2 will be represented on the plane F^2 by a circle of one-sixth of an inch in diameter. The distance from the plate to the lens being one-sixth of that from the lens to the object, the image will be on a scale of one to six, and points on lines—say interlacing twigs—one inch

* A communication to the London and Provincial Photographic Association.

apart in the object will be represented by circles just touching each other on the screen or plate.

With the lens of six-inch focus, the conjugate focus of the object at 150 inches distance will be $6\frac{1}{4}$ inches. The plate placed, as in the other case, at the focus of a distant object will be at F^1, one-quarter of an inch nearer to the lens than the focus for the near object, and the points of the image in the near object being one-twenty-



AB, aperture of lenses; F^1, focal plane for distant objects, of lens of six-inch focus; C^1, focus with same lens for object at distance of 150 inches; F^2, focal plane for distant objects, of lens of 25-inch focus; C^2, focus with same lens for object at distance of 150 inches.

fifth of their conjugate focus nearer to the lens, will be represented by circles of one-twenty-fifth of an inch. The distance—six inches from the plate to the lens—being one-twenty-fifth of that from the lens to the object, the image will be on a scale of one to twenty-five, and points in the object one inch apart will be represented by circles of one-twenty-fifth of an inch, that is to say, they will just touch one another, as in the case of the longer focussed lens.

The law, an example of which has just been demonstrated, may be proved to be true in relation to any other distances, and with lenses of any other focal lengths. Lenses of six and twenty-five inches focus have been selected as examples, because it happens that, with these proportions and the distance specified, the proof may be given without encumbering it with elaborate fractions. For the same reason, in order that the fact may be readily grasped, the proof has been submitted in a concrete form rather than in the abstract, where the mathematical arguments would have required more sustained attention on the part of the hearers.

The recognition of the optical law that the definition of the out-of-focus planes depends upon the absolute size of the diaphragm, independent of the length of focus of the lens, should be useful to photographers in other ways than that of exposing the fallacy of the "naturalistic" contention. It is generally understood that greater depth of focus can be obtained with a shorter focus lens, the aperture being of given proportion or speed, than is to be had with a longer focussed lens stopped only to the same rapidity. I have scarcely found any, however, who are prepared to admit that the difference is so great as it really is, and that the absolute size of the diaphragm, and not its proportion to the focal length, is the one factor to take into account. I have heard the question put thus: "If I take a full-length figure on a quarter-plate with, say, a seven-inch focus lens, I can get the accessories and background defined to an extent that is sufficient. Why, then, if I use a lens of double the length of focus, and a stop of the same proportion or rapidity, can I not get the same amount of general focus as in the former case?" To get this equal amount of definition, the law referred to shows us that a diaphragm of equal diameter—not proportionate to the focal lengths—is required, involving an exposure four times as long as in the other case.

The way in which the law of absolute size of aperture affects the "naturalists'" claim is this. If we admit their contention that we ought to make no allowance for the adjustability of the focus of the eye, but must represent the scene as it appears whilst the eye focusses some particular object, and that the lens ought to have the same, and no greater power of defining out-of-focus objects than the eye possesses when deprived of the privilege of adjustment, we shall find ourselves bound to the use of diaphragms of the same diameter as the aperture of the iris. This aperture, in a good light, is considered to average the one-eighth of an inch, and this, therefore, is the size of diaphragm which the naturalistic contention would indicate. Now, is that the kind of aperture used or directed to be used by the supporters of differential focussing?

It is very difficult, in a general way, to get them to fix upon any definite size or proportion so as to have a solid basis for argument, but there is no doubt that their dicta and productions point to the use of apertures much larger than those adopted by those not belonging to their sect, and, indeed, for views including no nearer objects than thirty feet or thereabouts, a diaphragm of one-eighth of an inch will give a picture in which all planes may be considered as thoroughly well-defined.

If the eye is directed to an object distant only a few feet or inches, and a more distant object is in such close proximity to the axis of the eye that it can be seen distinctly without other movement than that of altering the focus, there will be a distinct change of focus required for examining the one and the other object. This fact, no doubt, it is that has led to the supposition that, to represent objects as seen by the eye, the lens must have such a large aperture as to show planes in the picture in different focus. The argument would hold good—always supposing the power of adjustment be denied—if we are photographing objects at the same distances as those in the experimental test with the eye; this is not, however, at all commonly the case. About thirty feet is considered to be near enough for a foreground object in any general view, and if we look at any object at this distance, we shall see those beyond it to be all so well defined as not to require re-focussing of the eye to see them distinctly. To make the test, it is necessary that the nearer and distant objects should lie very near together, close to the axis of the eye. If they are at all wide apart, the removal of the axial line of the eye will be apt to lead to a confusion in the mind of the observer as to the change, if any, due to re-focussing.

Mr. T. R. Dallmeyer, in using the language of optical science to defend the "naturalistic" contention, adduces the case of a one-eyed gentleman who is stated to have the power of discriminating focussing up to a distance of sixty yards. If this is not a mistake, power to be able to discriminate between degrees of definition so minute indicates such a high separating or of defining power in the eye, that we should have to use the utmost defining power of our lenses to be able to represent it on our plates. Whatever the amount of out-of-focus want of definition discernible by the eye, however, it cannot exceed that of a lens having an aperture of the same size as the opening of the iris. Starting from the asserted power of focal discrimination possessed by the gentleman referred to, Mr. Dallmeyer has calculated sizes for openings, which he calls sight stops, for lenses of various focal lengths to give the out-of-focus effect desired, and adds* that he hopes to

* *Camera Club Journal*, May, 1890, p. 135.

arrive at an equation that shall give to other than the chief plane, at a given distance, a proportional out-of-focus effect. When the law of absolute size of diaphragm that has been demonstrated is recognised, it is seen that the equation required is exceedingly simple; it is merely necessary to take the size of the aperture of the human eye for lenses of all foci, and any elaborate calculation of different sizes for different lengths of focus is not only superfluous, but, if leading to any result inconsistent with the optical law mentioned, must be incorrect.

A great deal that is quite beside the question has been introduced into arguments in favour of blurring. Dr. Emerson introduces the question of the dispersion, spherical aberration, astigmatism, turbidity, fluorescence, and the blind spot, to which Mr. Dallmeyer adds diffused light, which he alleges to exist in much greater abundance in the human eye than in the photographic camera. I cannot do better than quote Mr. Dennis Taylor's reply to these charges brought against the most perfect and admirable of the organs of our senses. "As a matter of fact," he says, "the brain gains its impression of a photograph through the same imperfect, astigmatic, turbid, and blundering instrument of vision which it must perforce rely upon for an impression of the actual scene which the photograph represents. If the eye is astigmatic, then it will view the photograph in its own astigmatic fashion; if it is turbid, it will view it in its own turbid fashion, and so on. Allowing, too, that the photographic lens can define more minutely, and, as it were, see more than the eye can, does it therefore follow that the presence of microscopic details in the photograph implies that the eye must be conscious of them at the proper viewing distance? Certainly not, any more than that the eye will perceive all the veins in the leaves of a tree one hundred yards away because they all happen to be there."

The last resource of those who support the naturalness of naturalistic focussing is to say that we view things with two eyes, and that to represent the separate placings of the image on the retina, we ought to introduce the blurred outline of an out-of-focus lens into our pictures. How the effect of two images, taken from different points, each defined by being seen with a small aperture, should be truly represented by an image taken with a large aperture —large not only horizontally in the direction of the separation of the eyes, but vertically also—is not made clear; and, indeed, the attempt to represent binocular vision on the flat surface of a picture can only result in failure. There seem to be very strange misconceptions as to the facts of binocular vision. One writer, who now makes the fact that we see with two eyes his chief ground of defence for blurred definition, says that if images taken stereoscopically are put into a pair of lanterns and projected upon a screen, the images will coincide. The answer to this statement is very simple: they will not coincide upon the screen.

If the effect of binocular vision is really represented by the blurred image claimed to be necessary, whilst the argument in favour of a small aperture deduced from the law of equal aperture is allowed to hold good with regard to a representation of single-eyed vision, we ought to see something like the jump from the "naturalists'" blurring to the fine definition of a lens with small aperture when, after looking at a scene with both eyes, we close one of them. As a matter of fact, do we feel such an improvement, or are we sensible of seeing a scene more distinctly at all when looking at it with a single eye than when using both eyes?

A further objection to throwing part of the picture decidedly out of focus is, that the representation is in some points thereby made altogether different from the reality. It has doubtless happened to most of us to photograph a group out of doors in front of a background of trees and shrubs in which there are bright points of light from small interstices in the foliage. We have not intentionally placed this background out of focus, but have simply been unable, for fear of movement—especially in the collodion days—to employ a sufficiently small diaphragm to secure definition in the background. What has been the result? That the small angular points of light have come out as large and hideous circles of light. This sort of definition cannot truly be called natural.

Whatever may be argued on æsthetic principles in favour of blurring, or even on scientific principles if such principles are put forward as means to an end, whether natural or not, that may be desired, there is nothing to be said in favour of clothing unsound propositions in the language of optical science. Such a proceeding can only induce confusion in the minds of the many who are only too much disinclined to undertake the labour of thoroughly examining a scientific problem.

PROFESSOR LUCKHART ON ENGLISH PHOTOGRAPHY.

PROFESSOR LUCKHART, of Vienna, took the subject of the forthcoming International Exhibition at Vienna as a starting point for the following remarks at a recent meeting of the Vienna Photographic Society:—"A photographic exhibition like that planned by the Club of Amateurs at Vienna cannot but help to instruct and incite our companions of the craft. The Exhibition Committee of that Club has expressed its intention of calling together a jury consisting of eminent artists, who will select all exhibits as to their artistic merit, and reject the worthless. Pictures may be sent in anonymously, so that at the worst the exhibitor will be spared the painful feeling of public rejection. In England men such as Robinson and others have consented to take part, and I, for my part, can state that I have not only had enjoyment from those gentlemen's pictures, but have studied them, and learnt from them. I am convinced that many of my brother photographers will agree with me in this respect. It can therefore, gentlemen, only be of advantage to you to exhibit at such an exhibition, and be represented there. In the exhibitions of this Society we have often seen what you are able to accomplish, and I know that you possess the capability, if not of surpassing England's beautiful productions, yet of successfully competing with them."

THE PHOTOGRAPHIC CLUB.—At the Annual Meeting of this Club, held at Anderton's Hotel on Wednesday last, the following officers were elected for the ensuing year:—*Trustees*—W. Bedford, Frank Haes; *Committee*—H. D. Atkinson, H. E. Davis, J. Guardia, H. M. Hastings, F. Hollyer, R. H. Lloyd, J. Nesbit, E. A. Newell; *Curator*—F. P. Cembrano, Junr.; *Recorder*—E. Clifton; *Librarian*—C. D. Hesse; *Secretary* and *Treasurer*—F. A. Bridge, East Lodge, Dalston Lane, London. The subject for discussion on November 12th will be "The Advantages and Disadvantages of Toning and Fixing in One Operation." The Annual Dinner will take place on November 19th.

WILD BEAST PHOTOGRAPHY.*

Mr. Bolton has had more than one narrow escape. Once, for instance, he was taking the big tiger at the Zoo.; the lens was in position through the bars, and Mr. Bolton's head was under the cloth intent upon his work, when he heard a scream, and, before he could say Jack Robinson, the lens was rolling on the floor of the cage, and the cloth was torn off his head by the terrible claws of the man-eater. Since then Mr. Bolton has been more careful. One of his precautions, by-the-way, is to smoke, for the beasts cannot endure the smell of the weed. If one reflects for a minute, it is easy to understand the difficulties of taking one of these wild beasts, for they are no flash photographs taken by hand in a sixtieth or in the three-thousandth part of a second, like Mr. Muybridge's amusing series. Mr. Bolton gives the plate an exposure of a second, or a second and a-half, and a lion or a tiger seldom remains stationary for that period. The keepers sometimes help him by exciting the animal, or he plays a tune on a set of bagpipes, which may be bought from the man on the kerbstone for a penny. "But the most difficult of all animals, I think," continued Mr. Bolton, "is the Persian leopardess at the Zoological Gardens. The Polar bear is not easy, but you see I got him in three positions. Here he is standing up, there he is taking a dry swim, and there again you see him toes up, showing his hairy feet. It is all a matter of plates and patience. Again, it is not easy to take an oiled elephant on a warm day—oiled? he is oiled to keep his skin in condition—the flies swoop down upon him, and both tail and trunk whizz round like a teetotum. To photograph animals at all well you must have the patience of Job, and the luck of the Duke of Portland. And, by the way, talking of the big Indian elephant at the Zoo, I may tell you that he is growing, and even now he is only a few inches shorter than Jumbo. The measuring-mark is the tunnel at the gardens. Now here"—pointing to a fine photo of a European bison—"I call that Patience on a Monument, for it took me four days, shut up in his shed, to fix him. This bison has a fondness for rolling in the straw; and, as straw disturbs the harmony of a picture, I was compelled to follow him round each day, and pick off the straws! And patience was rewarded, as it always is."

Turning over the photographs which were strewn about the table, I found Guy Fawkes, the hippo at the Zoo. The difficulty in his case was to get the appearance of crackled roast pork of his skin. Here, again, is Big Jim, the Indian rhinoceros, and the Brazilian tapir—"the Conservative among animals," as that distinguished zoologist, Professor Flower, calls him, as he is the oldest type of mammal. Then there is the giraffe—who was taken walking in the fifth part of a second—the Queen's lion, and Prince Albert Victor's tiger cubs. Mr. Bolton is particularly proud of his photographs of zebras, and points out how necessary good representations of animals which are likely to become extinct will be to the naturalist in days to come. Here, again, is a photograph of three smiling crocodiles, taken in Paris the other day. Well may they smile, for have they not just breakfasted on kittens and puppies? And here, again, is a wonderful representation of the roaring sea-lion, also taken in Paris. Note the sheen on his fur, produced by the sun shining on his wet coat.

Mr. Bolton has many amusing stories to tell of his adventures in Tring Park when he was taking photographs of Mr. Walter Rothschild's famous collection of kangaroos, wallabies, emus, and rheas. It is no joke stalking a giant kangaroo on a hot day over the glades of a park which covers nearly four hundred acres, and staggering under the weight of a full-plate camera. In three days the photographer used 150 plates, of which only sixteen were perfect. "About my usual average," said Mr. Bolton. Mr. Rothschild (a son of Lord Nathaniel) is an ardent naturalist, and one of his most treasured acquisitions is a kiwi. The kiwi has no tail and no wings, and is nearly as scarce as the dodo. You may have roughed it in New Zealand wilds, and lived for years among the timber-clothed spurs of the wildest mountain ranges, without encountering this strangest of birds. But there is a live and blinking specimen of him at Tring, and here among Mr. Bolton's wonderful collection he is to be found, closely resembling a tripod; for he sleeps standing, and to support himself he digs his long beak into the ground. Another curiosity is the contumacious Australian cassowary, which is another of Mr. Rothschild's treasures. Mr. Bolton was defended from his attacks by two gamekeepers holding hurdles in front of the camera.

On the walls of the little sitting-room hangs a fine carbon print of a bloodhound, which is one of Mr. Bolton's triumphs, for he took him eighty-four times before this result was attained. It is Mr. Krehl's champion Cromwell, who is now known as the plate-smasher. This difficulty is easily understood when you look at the long ears of Cromwell. When his nose is still these ears are still going like a pendulum. How much the public appreciates a good thing when they see it will be understood when I mention the fact that four thousand copies of Mr. Bolton's well-known row of five bloodhound puppies alone have been sold. This fine specimen of a bob-tailed sheep-dog is known as "Wall-eyed Bob," and the wall-eyed feature of Bob's face is also the feature of the photo. Bob, by-the-way, was induced to stand by means of a certain monkey, who is a favourite model of Mr. Bolton, and you may see him depicted by the sun in the act of catching an active member of the flea community on his foot, which he calls "A Critical Moment." This is the result of over thirty shots.

Mr. Bolton divides his work into four series—animals, birds, dogs, and bones. These last he photographs for comparative anatomists, and a collection of them hang in the Geological galleries of the British Museum, South Kensington; and, shade of Poe! he uses a seven-year old pall, which was bought cheap from a sexton, for a background, and who can say it is not appropriate? Of the animals I have already given a brief description; the birds include a Stacy Marks series, namely, the pelican and the marabout stork, which are most comic. Amongst the dogs is a splendid specimen of a very famous corded poodle, who bears a strong resemblance to a walking door-mat. This kind of dog is much used as the duck decoy abroad. He floats down stream, and the stupid ducks mistake his cords for a bunch of seaweed, until he appears in their midst and sends them flying towards his master, who is a-gunning on the bank.

The subject of animal photography is full of interest, but we must leave it for the present.

* Continued from p. 849.

Prof. W. K. Burton has been elected an honorary member of the Photographic Society of India, in recognition of "distinguished services to photography."

Notes.

In relation to the keeping of glass studios warm in the winter, Sir David Salomons writes :—"A very simple way to warm a studio is the plan I adopt. At each end of the room is placed a Lux Calor gas stove, and the blinds are kept down at all times, excepting when work is being done. By this means the studio is kept as warm as if the roof were slated, with a ceiling below it." This plan is evidently good for adoption by amateurs and professional photographers in a small way of business, but of little advantage to a photographer who has sitters all day long. It would be well if the blinds could at the edges be made to so closely fit the wood-work as to practically imprison a layer of air between the fabric and the glass when they are not in use over portrait work.

Mr. E. de Saint-Florent has long been noted for his experimental researches in the production of photographs in natural colours upon paper, and he has recently sent to the Photographic Society of France some prints better fixed than heretofore. Four prints were forwarded. Number one was an "old one" which had been exposed "a long time" to diffused light; it had been fixed by fifteen hours' immersion in a three per cent. bath of solution of perchloride of iron. Number two was eight days old, and had not been affected by diffused light. Number three was one day old, and had been fixed in a "very dilute" bath of perchloride of iron. Number four was upon cardboard, and Mr. Saint-Florent says that the process he employed was a modification of the collodio-chloride method which he communicated to the Society in 1880. He takes a piece of Bristol board, and pours over it a thick layer of collodion containing nitrate of silver; when this is dry, he applies a second coating. After again drying in the dark, he plunges it into a fifteen per cent. bath of hydrochloric acid, and leaves it therein about ten minutes; he then takes it out and exposes it while wet to diffused light until the card turns violet-blue. He next "sensitises" it in a bath of nitrate of mercury, containing four drops of nitrate (strength not stated) to one hundred of common water. He exposes for fifty seconds under coloured glasses to the direct rays of the sun, and fixes by means of perchloride of iron. We may inform readers who have never seen photographs in natural colours, that those upon paper are inferior to those upon silver plates in appearance. The ground colour is too pronounced.

A friend who has lately had occasion to make a voyage to the Cape and back tells us that, on the particular line of steamers which he patronised, means are adopted to amuse the passengers which are indirectly dependent upon the photographer's art. When the outward bound vessel had been a fortnight at sea, and the passengers had had time not only to make each other's acquaintance, but to tire of one another's conversation, the steward brought out an optical lantern, and, upon a sheet hung in the saloon, gave a capital show of photographic lantern slides. After this, the hat was sent round, and, from the fulness thereof, our informant opined that the enterprising steward had no cause to regret his investment. The entertainment was repeated a week later, and a like exhibition was given on the return voyage.

The limelight and its paraphernalia do not seem to be easy things to rig up in a hurry, especially on ship-board, and, of course, bags and weights are out of the question in a choppy sea. On the occasion in question, the oxygen was drawn from a 40 ft. cylinder—which contained enough gas for four exhibitions—while the hydrogen was represented by an ether saturator. The arrangement, we are told, worked well, even when, on one occasion, the vessel was lurching in an uncomfortable manner. This new use for the optical lantern will, doubtless, extend to other passenger vessels which plough the seas, and certainly no better way of amusing home-sick—and, perhaps, sea-sick—voyagers could be devised.

Another somewhat novel use of the lantern was advertised a few weeks back in London. This was a "service of song" in a chapel, accompanied by dissolving views. Were such an innovation suggested in certain other places of worship, the dissolving views would be represented by vanishing congregations; but, as in all things, opinions on such points differ considerably. Many chapels are constantly used for secular lectures, and in these the lantern is in constant requisition, but, as far as we know, the case above referred to is the first in which the instrument has been used in the conduct of divine service.

While on the subject of the limelight, it may be useful to point out the urgent want of a better lime cylinder than those at present in the market. Many of these, although called "hard limes," are too soft when used with both gases under pressure, and rapidly disintegrate or split when in use. They are suitable, however, for the blow-through jet, and as this jet is more largely used than the other, the majority of buyers are content with them. The really hard kind are those known as Nottingham limes, but a box holding one dozen will hardly contain two of the same diameter, so carelessly are they turned. A lime cylinder of the requisite hardness, accurately guaged to a standard diameter, would soon find plenty of purchasers. As far as we are aware, such a thing is, at present, not to be had for love or money.

By degrees the optical lantern and photography are coming to the front in various ways—artistic, educational, commercial, and explanatory. Of the first, the ordinary lantern show may be taken as an example; of the second, the lantern is now being introduced into schools as a means of acquainting the scholars with foreign countries, and it must be admitted that it has an enormous value in connection with the study of geography. As to the commercial use of the lantern

and photography, travellers by the Underground Railway are now pretty well aware of the latest application. A small lantern containing an automatic arrangement by which a succession of advertisements is brought into position, is placed opposite a white disc, and forms an object of fascination for the people who are waiting for trains. Of course, such an arrangement is only applicable in a dark place, and the Underground Railway seems to be made on purpose for the exhibition.

As to the explanatory use of the lantern, a music hall entertainer has found it a good friend. The *metier* of this performer is the personation of prominent individuals, political and otherwise. The impersonations are produced by changing the countenance, but, as in the case of the ventriloquist, who generally informs the audience of the nature of the sound he is going to imitate, and where it is to come from, the impersonator has found it necessary to give a sort of key to the spectators, who have an unpleasant knack of being perverse, and not recognising the imitation. This key is furnished by an optical lantern containing photographs of the originals, and is so arranged that the impersonator can present a picture on the screen at the same time that he is giving the impersonation. The advantage of this plan is, that if the audience fail to recognise the human counterfeit presentment, they have the image on the screen to fall back upon.

It will not be long before the historical painter's vocation will be gone, so far as his own unaided efforts are concerned. The camera is an absolute necessity at all important functions, and though the painter may be called in afterwards, he relies upon the photographer for matters of detail. Thus, we are told that, at the recent Moltke celebration, was a presentation to him by the Emperor of a marshal's *bâton* of silver, magnificently inlaid with stars of crowns, rubies, and diamonds. Count Moltke was so overcome by emotion he could only murmur one or two words, but he took the Emperor's hand and "imprinted on it a long and fervent kiss." This was the moment seized upon by the attendant photographer. He obtained a picture of the episode, Professor Von Werner will do the rest with his brush, and a grand historic painting will be the result.

There is little doubt that this photographic innovation was initiated by the German emperor, who is an enthusiastic amateur photographer. Herr Zeisler, his personal photographic assistant, has been compelled to learn riding, to enable him, armed with his camera, to follow His Majesty on his hunts and other expeditions; in fact, he seems to "shadow" the Emperor William, and nothing is sacred from his "kodak," not even a recent well-known marriage ceremony, where Herr Zeisler played his "kodak" on the bridal couple. "Ah!" said the emperor, laughingly, seeing the astonishment of the guests, "I forgot to tell you that my photographer follows me everywhere. I gave him a personal *passe partout*, and you must not mind his goings on."

An interesting legal point has cropped up in connection with photography. Up to the present moment artists have been allowed in the courts of law, and have sketched at their sweet will plaintiff, defendant, witnesses, and judges. But it seems that if you take a snap-shot with a detective camera, it is contempt of court. Mr. P. O'Brien, M.P., who has already distinguished himself as a photographer in the Tipperary riots, has been committed for seven days for using his "detective" in the magistrate's court. The term "contempt of court" seems to be capable of a very wide application, and probably varies according to the particular taste and feelings of the judge. But would it not be best if the matter were settled once and for all, as, logically, there can be no difference between the pencil of the artist and the camera of the photographer?

Some artistic gentlemen are almost as concerned about the quality of the light by which they work as photographers. It is curious, however, to read that want of light has been the cause of the collapse of the Graphic Society. This society was an association of painters, sculptors, architects, and engravers; but somehow it has not succeeded, and the dull, lightless weather of London is given as the reason. Why does not the Graphic Society remove to Torquay, which, according to the Royal Meteorological Society, is the sunniest place in England? In 1889 there were 1,608 hours of sunshine at Torquay, and 54 sunless days. At Greenwich there were 1,158 hours of sunshine, and 105 dull days. Eastbourne comes next to Torquay, but here there is a great difference, as the dark days were 77 against the 54 of the Devonshire watering-place.

An extraordinary rumour finds publicity in a society journal. It is nothing less than a union of photographers, after the fashion of the Salt Union, which some time ago excited so much comment in financial circles. It is to take shape in the beginning of the year, and will be a combination into one great company of all the leading photographers in London. The matter at the present moment is in too nebulous a shape for comment, and it would be interesting to have some further particulars as to the authenticity of the statement. In the meantime, if the opinion of the public be that a photographic business yields enormous profits, one may venture to say that this opinion is based upon the business which used to be done, and not on the business which is done at the present time. In addition to the fact that the profits are not so large as in former years, the expenses are certainly greater, as a well-appointed studio and reception-room in a first-class position are costly affairs.

A NEW RAPID PRINTING MACHINE.*

BY FRIESE GREENE.

WHEN I was readiug in the PHOTOGRAPHIC NEWS of February 28th, 1890, a description of the camera for taking photographs consecutively from one point of view, at the rate of 600 a minute, invented by myself and Mr. Evans, I tnrned over a few pages and read a suggestion by the editor of that paper, entitled "A Printing Machine of the Future," in which he says that, "The chief value of the machine, or of a modification thereof, may hereafter be fonnd to be in a direction not contemplated by the inventors; at least, they have said nothing on this point—namely, in the printing of positives for book illustration—for in positive printing through a negative the amount of light can be made to vastly exeeed that present in the photographie street views, so that the limit of speed, especially with improved machines as yet unborn, is at present beyond calculation. One ean imagine the possibility of a practically endless band of paper being covered with some sensitive preparation as it nnrolls, then passiug on to the exposure platform, and afterwards into developing and fixing baths; at the present time, exposing a negative on a travelling band three thousand times in five minutes would not be bad work."

Well, after reading the above important suggestion, it linked idea after idea within me until my blood was fired with enthusiasm, for I thought of taking a scene in Hyde Park, or in the City—where the ceaseless stream of life is never ending—by the machiue camera one day, and produeing, in the course of a few hours, a paper whieh could be delivered to the public, showing true to nature all the movements of life, or auything that may be of interest whieh was photographed at the time. So you can gather from this something of the vastness of what it may be possible to aecomplish by the aid of the printing machine which I am about to show you, doing away with all the tedious sketehing and the troublesome bloek proeess whieh oeeupies so much time and costs so mneh. A well-kuown person's photograph, with his letter, conld be eopied by photography and printed by light mueh more quickly than you could set up the type for the letter, let alone making a bloek—whieh wonld take days—for the likeness, and then not so perfect as it would come ont when printed by light alone, for you eould not equal the texture and detail by the bloek process as you could by the other. Then, as regards the letter, you could have a *fac simile* without setting up any type, and read each individual's own handwriting.

I find in this age of speed that it is no good to have ideas if you do not put them into practice, so this maehine, which is the invention of myself and Mr. Varley, was soou begun, and eight months elapsed before the first band was printed: it seems ridiculous, when you look at the machine, that it should have taken so long. I could not finish it before. I will show you the first band printed by it; after that band was developed I saw the possibility of carrying out all the ideas, which, if I am spared, I intend to do, and the Bath Photographie Soeiety shall be the first to see them, for there is a link of affection attaehing me to the Society, being one of its founders. I will pass round the first band with forty to fifty pietures upon it, and I hope that before long you will see the first complete newspaper.

The most important feature of the machine is that the moment the exposure is given the paper must be still, and pressed to the negative. The results which you see before you are printed by gaslight, but of course the eleetrie light will be nsed in the future. I have also brought you a band with 400 pictures upon it, taken at the rate of three to four a second. I have brought the eamera whieh I took them by for you to see, and you will notice that the movements are the same as in the printing maehine, so with the two eombined I eould take a string of pietures in Milsom Street one day, and have them in a newspaper the next.

It would take too long to explain the maehine and camera in detail this evening, but, no doubt, soon a deseription, with blocks illustrating both, will be published in one of the papers.

* Read at the Bath Photographic Society.

THE PREPARATION OF THIOSINAMINE FOR POSITIVE DEVELOPMENT.

BY A. PERCY SMITH, F.I.C., F.C.S.

1. Preparation of allyl sulphocyanate or oil of mustard, C_3H_5CyS. Take blaek mustard seeds, bruise and maeerate for twelve hours in five parts of water. Distil till no more oil passes. Separate the oil, and use the aqueons distillate, whieh contains some oil in solution, for maeeration of fresh seed.

The crnde oil is dehydrated by ealcium chloride and redistilled till eolourless. It boils at 145° to 150°. The distillation should be effected in a draught eupboard, or other means be taken to avoid contact with the vapour of the oil, whieh has a very unpleasant effect upon the nose and eyes.

2. Saturate the oil with ammonia gas, or mix it with three to fonr times its volume of strong aqueons ammonia. Set aside until it crystallises, and filter. The mother liqnor should be boiled to expel ammonia, and then evaporated.

Thiosinamine, or allyl sulphoearbamide, $N_2CS.C_3H_5.H_3$, is in shining, white, inodorons prisms, having a bitter taste. It melts at 70° to 74°, and is readily soluble in hot water, aleohol, or ether.

SIXTY-FOUR of Mr. H. P. Robinson's photographs were on view in the rooms of the Society of Amateur Photographers of New York uutil September 27th, on which date they were sent for a month to the Photographie Soeiety of Philadelphia.

THE LARGE LENS.—A dispatch from Cambridge, Mass., says:—Yesterday the glass for the University of Southern California teleseope was unpaeked by Alvin G. Clark. Among those present were Judge R. M. Widney, president of the University Bank of Los Angelos, and a trustee of the University of Southern California, George Clark, and Robert Widney. When the lid of the big box was removed Clark tenderly lifted away the exeelsior fibre which eovered the preeious lens. The glass measures about 10ft. in eireumferenee, or 4ft. 4in. in diameter. Although it is 2½in. thick at the eentre, and 1½in. at the edge, it was as transparent as a bit of thin plate glass. Clark's hands fondled it as he would a baby while he murmured: "What a beauty it is. No one ever saw its like before." It is nearly five iuehes wider in diameter than the Lick teleseope glass. Clark says that its eurve on one side is almost perfeet, as he aseertained by the aid of a spheroid, but that the other will stand a great deal of eutting down. He has not yet deeided whether he will have the work done at his manufaetory in Cambridgeport, or put up a new plant to complete it near the scene of its future home in California.—*Invention.*

APPARATUS AT THE PHOTOGRAPHIC EXHIBITION.

V.

In the present Exhibition there is another camera, in addition to the one previously described, so made that it can be extended and used within its case. Messrs. Shew and Co. exhibit their well-known and popular "Eclipse" hand-camera inside a leather case, which case is no larger than an ordinary sling cover. It is represented closed in fig. 14, with the ends of the two straps.

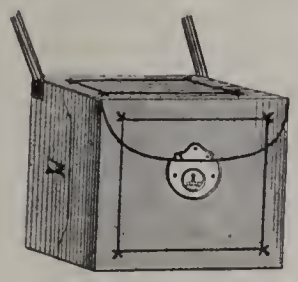


Fig. 14.

Fig. 15 represents the case open ready for use. The right hand is in the position for starting the shutter, and the left supporting and helping to steady the camera. The removable finder is held in grooves on the top of the leather case. To open the slide, the side tuck-pocket is turned back, and allows the slide-shutter to be withdrawn. The removal of the slide to reverse the back is done through a small opening opposite the end of the slide on the other side of the case, through which the operator pushes his thumb, and then seizes the slide with the other hand.

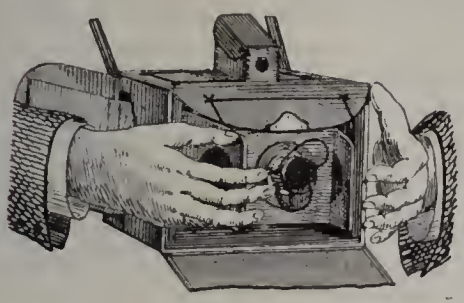


Fig. 15.

The case contains the camera, three double backs, and the finder, all so closely packed that there is no waste space. For large sizes it will be specially advantageous, because the case and strap help to give support and to steady the camera. In fig. 15 a portion alone of the folding flap of the case is represented.

Fig. 16.

Another exhibit, by the same firm, is a double-ribbon magnesium lamp, smaller than those hitherto made to drive the ribbons in pairs. The ribbons emerge side by side through separate small tubes.

The Fry Manufacturing Company exhibit photographs on some handsomely embossed and stamped sheets of celluloid, made in close imitation of ivory; they are of elegant appearance, and a general idea of them may be gathered from fig. 16. The use of celluloid in photography is of comparatively recent date. So far no objections to it on the score of durability have been discovered, although in some instances specimen photographs on it have been exposed in street show-cases for about a year.

The same firm exhibits the Hibbard repeating flash-lamp, represented in fig. 17, and as Messrs. Fry and Co. sent us one of them about a year ago, we have had occasional experience in its use. A good point about the lamp is that it is held in the hand, and can be made to give two or more flashes in quick succession, so that, if the lamp be moved a little forward between each flash, the light is somewhat diffused, and harsh shadows more or less avoided. Pleasing portraits of sitters may thus be obtained by its aid in private drawing-rooms; we have not tried it upon groups, but only upon one sitter at a time. The pneumatic chamber is held in the hand like the handle of a pistol, and the little spirit lamp projects in front. The cut represents the various adjuncts sent out with the lamp.

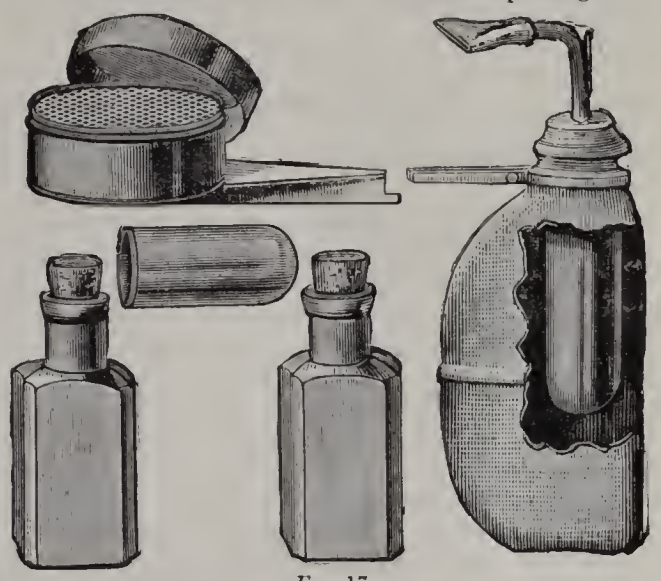


Fig. 17.

With all lamps in which powdered magnesium is blown through a flame, some of the metal usually escapes unburnt. The nature of the sample of the metal bought has much influence over the amount of this waste. Some samples are coarse, like filings; others are fine, like flour. The latter give a rapid and more brilliant flash. Possibly in them the metal may sometimes be purer, because pure magnesium is a "rotten" easily-powdered metal, but, when toughened by the admixture of zinc, it may be more difficult to get into a state of fine division, and its affinity for oxygen is lowered. Fine powders ignite more rapidly than coarse ones, all other conditions being equal; in fact, some metals, when reduced to an abnormally fine state of division, will spontaneously ignite by mere exposure to the air.

WANTED, A WORD.

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

TECHNICAL terms, of the right kind, are among the most useful of scientific aids; but alas! many technical terms are far from being appropriate, much less self-explanatory. Two photographic technical terms of very recent birth are far from satisfactory—viz., "orthochromatic" and "isochromatic." These two terms are both applied to those plates which are supposed to render negatives of coloured objects in the true value of the luminosity of their colours. It seems that these terms are applied indifferently, and it is only fair to add that they are about equally inappropriate.

The former of the two (orthochromatic), if it means anything, can only be applied to photographic plates in the sense of their rendering a negative in right or proper *colour*; compare *ortho* in orthography, orthodoxy, and orthoepy.

The second term (isochromatic), in turn, can only, in this connection, be construed to mean equal or average colours—*i.e.*, all colours equally; compare *iso* in the compound isobaric, isothermal, isoclinal. (N.B.—Nuttall defines isochromatic as "having the same colour.") Thus, as I have elsewhere previously pointed out, neither of these popular terms conveys any hint that their meaning includes the idea of *proportional brightness*, and I have already suggested that the word "metriolamprotic" would have met the requirements of the case. Possibly my suggestion came too late, or, possibly, the conservative "cussedness" of the English in general, and photographers in particular, made them stick to a blunder, having once made it. However, now that the advocates of the production of photographs by means of the so-called pinhole are about to separate themselves, by all means let us have a term which is something more like civilised language than the mongrel term "pinhole-photograph"—a term about on a level with cablegram.

I have failed to find any Greek word which corresponds exactly with pinhole, and the nearest approach to this is the word τρῆμα (*trema*, with the *e* long—*i.e.*, pronounced treema), meaning, "that which is pierced through," a hole; *e.g.*, eye of a needle; holes or pips of dice. Thus, we may compound a word "tremagraph" (*e* long) without offending against reasonable sound and sense, and, furthermore, there is another argument which, with many people, is of paramount importance—viz., it is *two syllables shorter* than the mongrel "pinhole-photograph."

It may be urged that the word means simply a writing or drawing made by means of a punctured hole, and does not include the notion of light being the active agent in the production of the picture. To this objection nothing can be said beyond the advice to add our old and well tried "photo;" thus, the new child in all the honour and glory of its birthright will be "photo-tremagraph," but for common and vulgar use to be shortened into "tremagraph."

Most of us can remember the old story (with a grammatical moral) concerning the little boy who asked his uncle "how long he'd been an *antiquarian?*" and the answer of the uncle to the effect that "he never remembered being an adjective, and preferred to be called by the noun *antiquary*."

If ever the things we call photographs should speak, they would begin their remarks by asking us why we call them verbs and not nouns, and would, with justice, point out that if we used the word "cryptogram," "telegram," and even that bar-sinister term "cablegram," we were treating them unjustly in not applying to them the term "photogram."

PICTORIAL DEFINITION.*

BY A. COLLIER.

I FEEL, somehow, drawn to this subject, in spite of the hesitation one feels in constantly making oneself heard at these meetings. It is difficult, no doubt, to stick to the title of the paper.† I thought so when the reader of it held up a book and challenged another member to read the title on the back. Were we not pretty close on telescopic definition instead of pictorial?

Whatever may be the outcome of this discussion, it will end, no doubt, in each of us having our own ideas of what definition ought to be, and quite right too; is it not entirely a matter of taste whether we make this, that, or the other the sharpest bit in our photograph, guided by one's common sense, just as much as choosing the point of view? We all agree, I suppose, that many good pictures can be made of a good subject from different points of view—in fact, you will seldom find two painters agree which is the best point of view. In that respect I have little or nothing to say about it. It is when others—if only a few, fortunately—differ widely from our own preconceived notions of definition, that we seek to know the reasons, and if not good and sufficient, reject them. I do not myself care for extreme sharpness, and detest hardness as much as the most enthusiastic pin-hole photographer going. It is the other extreme—describe it as you will—and the pretentions of the pin-hole, naturalistic or fantastic school, that I intend having a tilt at, and that from an artistic point of view only. One feels tempted here to ask the question: What constitutes a school? The schoolmaster and another!

These naturalistic photographers would have us believe they are for nature, nature before anything, and hang conventionality. Just as if, by *only* going to nature, you can avoid it. Where, may I ask, can you find a better example of conventional treatment than Emerson's "Hay Cart" from nature? And as to their idea or impression of what nature is can only be properly rendered through a pin-hole, or lens out of focus—of the two, I would rather have the pin-hole definition than the "judicious use of the stop" as shown by Emerson. We have here a wandering of the focus with a vengeance. Mr. Everitt, the other night, thought these prints were entitled to be considered pictures or works of art, because they recalled scenes with which he was familiar. Now, this is a mistake. If he seeks for no higher quality in art than this, his standard must be a very low one indeed. The artists on the pavement will produce something which will recall scenes; but perhaps Mr. Everitt considers these pictures and works of art. The roughest blot or slightest sketch will do this and more; your imagination is at once called upon to fill up what is wanting in the sketch. No one will contend that the sketch is a picture or work of art because you feel a certain charm in exercising your imagination. Therein lies the charm; it is not in the sketch, and certainly is not in these prints. The charm to a painter is what he feels he could do with

* Read at a meeting of the London and Provincial Photographic Association.

† "Pictorial Definition," by Mr. P. Everitt; read Sept. 4th, 1890.

the subject; it is suggestive because it has lost the hardness one usually finds in photographs. But fuzziness, or whatever term you may use to describe want of definition, is not in itself artistic, or yet a quality in art, any more than smoothness or softness.

The impressionists tell us, Mr. Everitt told us the other night, was Emerson's theory; if you are painting the middle distance, and only conscious of the foreground, why paint it? Quite so; if the foreground is of no importance, why paint it, even as you are only conscious of it? But no, the foreground is too important to be left out, and, as none but impressionists understand these things, they get over the difficulty easily enough by painting it as they are only conscious of it.

Now, I contend that if you look at the foreground as you do the middle distance, you ought in common honesty—there is such a thing as honesty in art—I say in common honesty you ought to render the one in relation to the other as you see it. To say you are only conscious of what you ought to study and endeavour to render truthfully, is nothing but mere affectation; and shirking the difficulties of painting just where they begin, and in a less degree shirking the photographic difficulties of rendering the definition, with an eye to atmosphere and movement, is not a proceeding to be commended.

One may well ask if they have ever seen this nature they imagine they are looking down upon from their lofty pinnacle, condescending to look at a bit at a time, conscious, no doubt, that more than an angle of nine degrees is too much for a weak brain. If they will but study what they confess they are only conscious of, they will in time feel less inclined to cackle about it as they do. So far they are only trying to imitate a few who call themselves naturalistic painters. Do the photographic imitators imagine there is nothing more in the work of this so-called naturalistic school than haziness of outline? One would think so, seeing that is as near as they have got to it, or may ever hope to get. If they had any real artistic feeling in them they would know how utterly hopeless it was to attempt it. There is something more in some of the work of this new school of painters difficult to express without examples, and still more difficult to find in much of the so-called impressionist or naturalistic work one sees about.

It is the mind and soul, as it were, of the man showing in his work that is the backbone of all true art work; without it, it is nothing but a meaningless daub. Where we find this quality we tolerate the slovenly execution or want of definition, as we tolerate the mannerisms of an actor or musician if he appeals to us, or touches a responsive chord in our nature; just as the indifferent manipulation of Rejlander was tolerated at a time when a "clean plate" was thought more of than now, when he gave us something with a little thought in it.

Is it not, then, an insult to one's common sense to be told of the characteristics of the photographs used as examples by Dr. Emerson and Mr. Everitt, that these points are all that one could desire, and that the other is just as it should be, when they are nothing but an out-of-focus transcript of the scene before them at the time of taking the cap off the lens?

An Association of Professional Photographers is being formed, of which Mr. C. P. Richards, of Barrow-in-Furness, is the secretary.

Patent Intelligence.

Applications for Letters Patent.

17,157. J. Gunn, 5, Smardale Road, Wandsworth, "Compound Objectives."—October 27th.

17,189. J. E. Thornton, 3, New Lorne Street, Moss Side, Manchester, "Flexible Photographic Films."—October 28th.

17,190. E. L. Dutton, Arden, Cheadle Hulme, near Stockport, "Photo. Cameras."—October 28th.

17,264. E. A. Boissaye, 53, Chancery Lane, London, "Photographic Plate-Washing Racks."—October 28th.

17,339. R. Fowler, 6, Lord Street, Liverpool, "Cameras and Sensitive Plates."—October 30th.

17,445. W. F. Stanley, 28, Hatton Garden, London, "Portable Photographic Apparatus."—October 31st.

Specifications Published.

17,744. *November 7th*, 1889.—"Machinery for Cleaning Glass Plates." William John Wilson, 6, Malden Road, Watford, Herts, Chemist.

To carry out my invention, I use rollers made of metal or other suitable rigid substance, and coated with a softer elastic material, such as vulcanised india-rubber. These rollers are arranged in pairs, one roller over the other, and caused to revolve in such a way that a plate of glass placed between them is gripped and carried forward in a horizontal plane. Before the plate is entirely passed through, its front edge is gripped by another pair of rollers, which continue its motion forwards, and successive pairs of rollers are arranged so as to carry the plate onwards as far as may be necessary. As the glass passes, along its upper and under surfaces are both brushed by pairs of brushes moving between successive pairs of rollers, the brushes have a rapid oscillatory motion in a horizontal plane, and in a direction at right angles to that in which the glass is moving. The brushes and glass are kept wet by suitably arranged jets of water or other cleansing fluid, and the cleaned glass may be delivered by the machine either in a wet state, or dried by passing between dry rollers, or pads, or squeegees. The brushes, or some of them, may be replaced by pads of leather, sponge, felt, or other suitable material, and a dry powder may be supplied to them instead of the liquid, so that the glass is polished dry instead of or after being washed.

20,661. *December 23rd*, 1889.—"Heating Glass Rooms." John Poat, St. Sampson's, Guernsey.

Whereas it is frequently the case that furnaces used for steam boilers or other purposes already exist in close proximity to green-houses, and from which the heat from the furnace, in order to create a strong draught, is allowed to pass away from the flues at a high temperature, I now, under my invention, propose to utilise this waste heat to create a hot water circulating system to be applied to an adjacent green-house or similar building. In the flues of the said furnace, or immediately in connection with the furnace itself, I employ water tubes, forming the heating surfaces for an independent hot water circulating system for the heating of an adjacent green-house. I may carry fire-tubes of smaller diameter than the water tubes through the centre of the latter, so as to present both an internal and external heating surface to the water tube; or I may introduce such special water heating tubes, with a distinct connection to a green-house hot water system, into, through, or amongst any boiler shell or tube boiler which may itself be used for other distinct purposes.

18,826. *November 23rd*, 1889.—"Cameras." Clifford Lawrance, 27, Martin's Lane, Cannon Street, London, E.C., Manufacturer.

My invention consists in an improved method of arranging and changing plates or films in a detective camera-box, and also in mechanism for working the shutter thereof.

According to this invention, I arrange the plates or films in book form, each plate or film being retained in zinc or other frames, being bound or hinged together at one of their sides or ends, preferably at one side, in such a manner as will allow them to fold over freely and be exposed respectively. This book, containing the plates or films, is provided with an outside

cover, as an ordinary book. The book containing the plates or films in the camera is supported on a partition or other support, with their bound or hinged sides resting on the support. These zinc or other frames are pressed against four or more clips or stops in the camera by means of a spiral or other spring. In the opposite ends of these said zinc frames I cut alternate slots corresponding with the said four or more clips or stops. These clips or stops are connected by means of liners or rods to a knob or thumb-piece, operated from the outside of the camera. When it is desired to change a plate or film, the thumb-piece or knob is moved, which, operating the levers or rods, brings the four or more clips or stops opposite the corresponding slots in the zinc frames, and, owing to the pressure of the aforesaid spring on the said frames, one plate folds over and exposes a fresh surface plate or film. This is continued until all the plates have been exposed and the book exhausted. I provide suitable springs, which are fixed in the body of the camera, so as to break the fall of the plates as aforesaid, and prevent same from folding back if the camera should be inverted. The lens may be covered by a circular or suitable flap, which is attached to a rod which is pivotted at one end, the other end being attached to a thumb-screw or small milled head. This circular or other flap is for the purpose of covering the lens, and excluding light from the interior of the camera when required; a suitable spring is provided in order to keep the flap closed or open, as may be required. The shutters are actuated, according to my invention, by means of a cam actuating a rod attached to a sliding-piece, which in turn is connected to two more rods, the said rods actuating the shutter. I employ an ordinary clock spring or its equivalent to actuate the same. These shutters or wings are operated from the outside of the camera by means of a push connected by means of two rods to a catch-piece or short rod operating on a stop affixed to the said cam. I may also provide a similar stop for the purpose of keeping the shutters or wings open when required, by means of a lever and short rod operating on the said stop affixed to cam.

13,054. *August 20th*, 1890.—"Magnesium Flash-Lamps." GEORGE ADOLF SINSEL, Plagwitzerstrasse No. 9, Leipsic, Saxony, Manufacturer.

These improvements relate to magnesium flash-lamps, and consist in the arrangement with the lamp of a reservoir for containing a supply of the magnesium powder, and in the construction and arrangement of an adjustable piston moved by pneumatic pressure, by means of which the quantity of powder to be fed to the flame of the lamp or burner can be exactly regulated. The current of air which operates the piston also serves to eject the powder.

The inventor claims:—

1. A magnesium flash-lamp constructed, arranged, and operating as described and illustrated in the specification.

2. In a magnesium flash-lamp, the combination and arrangement of a cylinder and piston, the piston being arranged to be pressed against the end of an adjustable hollow rod by means of a spring, and the cylinder having an air bye-pass, substantially as hereinbefore described, and as illustrated by the accompanying drawings.

3. In a magnesium flash-lamp, the construction and arrangement of a piston having passages therein, and its combination and arrangement with a tube as described and illustrated in the specification.

4. In a magnesium flash-lamp, the construction and arrangement of the cylinder having an air bye-pass, as and described and illustrated.

13,191. *August 22nd*, 1890.—"Improvements in the Dusting-on Process." GEORGE WILLIAM WOOD, 3, Askew Road, Gateshead-on-Tyne, County Durham, Clerk.

My invention refers to improvements in or relating to the "dusting-on" process of producing pictures by photography. In the production of positive pictures by what in photography is known as the "dusting-on" process, the support, which is generally a plate of glass or opal glass, is coated with a deliquescent organic matter intermixed with bichromate of potassium or ammonium. These mixtures are sometimes termed "photogenes," and as such will hereinafter be referred to.

After drying, the support is placed under a diapositive, and exposed to the action of daylight, and after exposure the image is developed by dusting on some suitable black or dark coloured matter in the shape of a fine powder, the result being a reproduction of the image of the diapositive employed.

It will thus be seen that if it be desired by this process to make a positive from any given negative, it is necessary, in the first place, to make by some other process a diapositive or transparent positive from it (the negative).

The object of my invention is to provide a "dusting-on" method or process for producing positive images or pictures direct from the negative, and I effect this as follows:—

A support, generally a sheet or plate of any suitable black or dark coloured material—such as ebonite, or vulcanite, or ferrotype plate or glass coated with black or dark coloured varnish or enamel—is, after being well cleansed, coated with a "photogene" such as the following:—

Gum arabic	... 30 grains
White loaf sugar	... 30 ,,
Ammonium bichromate	... 20 ,,
Distilled water	... 1 ounce

This formula works very well, although any of the other well-known "photogenes" will answer the same purpose.

After drying, the support is placed under a negative, and exposed to daylight for a time dependent on the density of the negative and the strength of the light, generally from five to twenty minutes, but an actinometer should be used as in carbon printing. The image is next developed by "dusting-on" some suitable lustrous substance, such as the white, gold, or other light-coloured bronze powders obtainable commercially, or aluminium, magnesium, zinc, tin, silver, or other suitable metal or alloy reduced to powder may be used. It is obvious, also, that any suitable light-coloured, or white, or nearly white substance, such as ivory dust, white marble, or sulphate of barium, may be employed, but substances possessing a metallic lustre, on account of the superior brilliancy of the images produced therewith, are preferred.

Good results may be obtained by reducing salts of silver to the metallic state by precipitation with a suitable reducing agent, *e.g.*, a fifty-grain solution of silver nitrate is precipitated by adding to it a solution of ferrous nitrate and ferrous sulphate intermixed and slightly acidified. The standard developer employed in the "ferrotype" or collodion positive process answers well. The precipitate, after being well washed, is dried, passed through a fine lawn sieve, and may then be used as above set forth. After "dusting-on" is complete, the plate or support is coated as usual with collodion well washed, and finally varnished as a protection against oxidation or other injury.

The above procedure may, if desired, be varied by taking as the support a sheet of plain glass or other transparent medium, coating with photogene, drying, exposing, developing, and finally "backing up" the support with black varnish or printers' ink on paper as in the collodion positive process on glass.

What I claim is:—

1. The use of a light-coloured or white, or nearly white substance for "dusting-on," a dark coloured or black, or nearly black support prepared and applied in the manner and for the purposes substantially as here described.

2. The improved process of producing positive images or pictures direct from the negative, substantially as and for the purposes herein described.

A GOOD PASTE.—A paste which will stick anything is said by Professor Winchell to be made as follows:—Take two ounces of clear gum-arabic, one and a-half ounces of fine starch, and half an ounce of white sugar. Dissolve the gum-arabic in as much water as the laundress would use for the quantity of starch indicated. Mix the starch and sugar with the mucilage. Then cook the mixture in a vessel suspended in boiling water until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by the addition of camphor or a little oil of cloves.

Correspondence.

MR. DEBENHAM AND SPHERICAL ABERRATION.

Sir,—I feel bound to reply to your correspondent's letter of last week, and to enter a protest against such inferences as may be drawn from the first and final paragraphs. The only excuse your correspondent has is *ignorance*. Due respect to the conventionalities has alone prevented me from insisting on this before, but there is such palpable evidence of it in the remaining portion of the letter that it speaks for itself.

Mr. Grubb, at any rate, understood that the introduction of spherical aberration altered the disposition of rays as compared with those of an aplanatic lens. Mr. Duner is only unfortunate in the *title* of his paper, "On the Diffusion of Focus," which is evidently all that your correspondent could understand of it, for the paper has *nothing whatever to do with transversal measurements as applied to lenses with spherical aberration!* At the Parent Society, early in 1888, your correspondent being present, I was the first to give formulæ for "depth of focus" when referred to transversal measurement of circles of indistinctness in out-of-focus planes for *aplanatic* lenses, where *they are of value*.

As to the third paragraph, I am prepared to prove myself right, in the *cases I cited* against your correspondent, to any scientific man or meeting interested in the subject, and to explain those cases where readjustment is necessary.

As to the fourth paragraph, my reply should be sufficiently understood from the quotation from my Camera Club paper. A careful experimentalist would see in the subject chosen the reason for the *missing* outwards on the *inside* of the focus tending to reversal, but for the best focus of minute structure, the visual and early stages of development would show Nos. viii. and xv. decidedly better than xi. and xvi. in the negatives.

My reasons are evident for declining farther waste of time in this argument with your correspondent.

25, *Newman Street, London, W.* Thos. R. Dallmeyer.

The first paragraph of the above letter, and the concluding paragraph of Mr. Debenham's letter last week, are rather strong. The long discussion must end here.—Ed.

EYEPIECES FOR FOCUSSING.

Sir,—I observe in a paper by Mr. W. H. H. Clark, read before the American Convention, and printed in your issue of Oct. 24th, a repetition of a statement implying a not uncommon optical error, a correction of which may be useful to those photographers who use magnifiers for the direct examination of the optical images produced by their lenses—an aid which I have found very useful.

It is stated, concerning the great Lick telescope, that "it is now supplemented by a remarkable piece of mechanism—an eyepiece, which has just been completed—out-rivalling anything of the kind before made; the largest before in use being not over two inches in diameter, while the new piece measures over three inches." Further, that "the light from the heavenly bodies seen through the Lick telescope and this new eyepiece will be 2,000 times as great as that seen with the naked eye"—apparently implying that the larger eyepiece transmits somehow more light. As to its phenomenal size, perhaps jealous Britons may find comfort in knowing that—as I myself saw some thirty years ago—an eyepiece of no less than *six* inches in diameter was in use with the Earl of Rosse's gigantic reflector. I remember being shown also the great plane speculum, six inches across its smaller diameter, and, therefore, just capable of reflecting pencils enough to illuminate the whole field of view of this huge eyepiece. But I believe the eyepiece itself was never thought worthy of special mention, being used mostly as a sort of finder, and necessarily unable to convey to the eye the full light of the telescope. According to the following explanation, the eye could only admit from it the light reflected from a portion of the great speculum of, perhaps, 14in. to 18in. in diameter; the full aperture being 72in. The new large eyepiece for the Lick telescope, assuming its focal length to be, as is usual, about equal to the diameter of its field-glass—3in.—appears, on the other hand, to be judiciously planned for observing purposes. It may well be, too, that improvements have been made in the optical construction, an account of which would be of real interest. The serious optical error in the description given is, however, that an actual advantage in the total amount of light received from a heavenly body is supposed to be obtained by its unusual dimensions; and this is impossible. Indeed, as with the great Rosse telescope, the effect of using an eyepiece of large dimensions, and, consequently, of low power, may often be to diminish the light which reaches the eye, and can never be to increase it.

For it follows necessarily, from the accepted optical theory, that the diameter of each pencil of rays, as it emerges from an eyepiece—whether employed with a telescope or with a photographic objective—must always be equal to the aperture of the object lens, divided by the linear magnifying power obtained; this magnifying power being defined as the focal length of the objective, divided by that of the eyepiece; and if this resulting diameter be greater than that of the pupil of the eye, part of the light is necessarily wasted. Part is usually wasted with a binocular glass, the power of which rarely reaches five diameters; while the aperture often exceeds 2 inches. And, under such conditions, the diameters of the lenses of an eyepiece have no more to do with the amount of light from a given object available for vision of it, than the diameter of the lenses of a wide-angle doublet have to do with the intensity of the lens; this intensity being determined not by the size of the lenses, but by the aperture of the stop. For the width of this opening of the pupil of the eye, varying continually as it does through the sensibility of the visual organ to varying intensity of light, averages generally not more than from about $\frac{1}{6}$ to $\frac{1}{8}$ of an inch (Quain gives 0.14), and, with a magnifying power of 5 diameters, a pencil of rays of $\frac{1}{6}$ to $\frac{1}{8}$ inch diameter at the eye corresponds to one of $\frac{5}{6}$ to $\frac{5}{8}$ in. at the object lens; all apertures greater than this ratio going to increase, not the brilliance of the image, but the extent of the field of view.

By the same rule, if we wish to examine directly with an eyepiece the image formed by a portrait lens of, say, 12 inches focus and 3 inches aperture ($f/4$), we must use—that we may judge of the full aperture—an eyepiece not less powerful than from $\frac{2}{3}$in. to $\frac{1}{2}$in. focus, the more powerful eyepiece being required for so bright a light as would cause the pupil to contract to $\frac{1}{8}$ in. If our eyepiece is of lower power, we may as well stop down the lens in the same proportion.

By the same rule, again, the Lick telescope of 49ft. focus and 36 inches aperture would require an eyepiece only just over 2 inches focus for the eye to admit all the light from a really bright object; but from a very faint one, in looking at which the pupil might dilate to 0·18 in., the eye could receive all the light transmitted through one of just under 3 inches focus. Thus, the size and power of the new Lick eyepiece seem eminently judicious; but it is absurd to claim for it the advantage of transmitting more light. Not that the light transmitting power is exaggerated. Far from it—indeed, I should estimate the light received from the telescope as nearer thirty thousand times than two thousand times that received by the naked eye.

As regards the practical employment of such magnifiers in focussing photographic lenses, the use of a powerful eyepiece on a lens of great intensity is very difficult, from the extreme nicety of adjustment required; while, as we have seen, a weak eyepiece is deceptive, except with a small stop. So that a good focussing screen, with or without a magnifier, is most generally convenient. But, when focussing dark interiors, or paintings, which demand a small stop and a long exposure, I find it a great comfort to dispense with ground glass (except in adjusting for position), and to use a plain glass focussing screen with an eyepiece of low power and very large field. I have one of my own construction, of about $2\frac{1}{2}$ inches diameter and focus, so adjusted that when in contact with the screen the other side of the glass, corresponding in position with the sensitive film, is in focus. By this means the faintest detail may be accurately seen with a very small stop, and the position of best focus promptly determined. W. H. Wheeler.

106, *High Street, Oxford.*

WATKINS' EXPOSURE METER.

SIR,—In your careful and appreciative notice of my exposure meter there is a statement which requires explanation, or it may lead to misapprehension. You say that the adjustment of one of the rules is left to the judgment of the observer, and may be known as the "judgment ring." This might naturally lead to the idea that a correction has to be made by the photographer in order to make amends for the shortcomings of the method adopted. Certainly this is not the case. The adjustable scale in question is to express the photographic value of the subject (quite independently of the light), and this value depends chiefly upon its colour, a quality which obviously can only be estimated by means of the eye. The value of the subject varies within well defined limits, the extremes being 25 for white objects, and 300 for exceedingly dark non-actinic ones, and 100 is the average or standard subject number used in four cases out of five.

Regarding the sensitive salts to be used in the construction of an actinometer, the requirements are very different to those for which Bunsen and Roscoe worked, and Captain Abney gives a decided opinion upon the merits of chloride *versus* bromide (or bromo-iodide) for this purpose. He says :—"If a photometer is to be used for any photographic purpose it should be a rigorous rule—a law of the Medes and Persians, in fact—that whatever sensitive salt is employed in the process, the same should be used, in as nearly as possible the same condition, in the photometer." I have made a very large number of experiments in order to find a formula for a suitable sensitive paper, and I do most emphatically assert that the darkening of the paper sent out with the instrument is in exact relation to the sensitiveness under varying lights of an average commercial plate.

I fix upon the standard tint by exposing the paper to a standard amount of light—equal to two seconds' exposure to the strongest possible sunlight in England.

After all, the important point is whether the instrument, as a whole, *does* accurately estimate exposures under all possible circumstances, and I prefer to deal with this in your advertising columns.

Photographers are not slow to give information to each other, and as some hundreds of my instrument have gone into use, its value is now being weighed in the balance.

Hereford, Nov. 1st. ALFRED WATKINS.

A PROPOSED CAMERA CLUB FOR SOUTH LONDON.

SIR,—For some time past the North Surrey Photographic Society has been making efforts to establish a Camera Club in South London.

A scheme has now been formulated which promises to be an entire success, provided we can obtain a fair amount of support and co-operation from amateurs residing in the neighbourhood.

It is proposed to take premises which shall include a large meeting room, commodious dark rooms, library, enlarging rooms, &c., with arrangements for the supply of refreshments and eatables.

A club founded on these lines, while offering all the advantages of a social club, would also provide for the carrying on of photographic work by members who wished to take advantage of it; while its promoters believe, from very careful estimates, that the whole expenses will be met by a guinea subscription.

The districts included in the scheme would be Norwood, Dulwich, Brixton, Herne Hill, Streatham, Sydenham, &c., the site of the premises to be as central as possible.

May I request any gentlemen willing to co-operate in such a scheme to communicate with me, so that a meeting may be called to set the matter in motion.

HAROLD SENIER, *Hon. Sec. N. S. P. Soc.*
88, *Norwood Road, London, S.E.*

[PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—On Tuesday, November 11th, at the Exhibition, 5A, Pall Mall East, at 8 p.m., the medals awarded will be presented; reports made of the Society's new premises and the proposed Photographic Institute; and a paper will be read on "Density Ratios as Affected by Development," by Mr. Chapman Jones, F.I.C., F.C.S.

Proceedings of Societies.

THE CAMERA CLUB.

ON Thursday, October 30th, an exhibition of lantern slides was held at the Camera Club, and members and friends brought over 200 slides for the occasion. A varied exhibition was the result. Mr. Williams contributed landscape scenes; Mr. White and Mr. Lardeur, microscopic subjects; Mr. Griffiths, some effective subjects taken in East Anglia; Mr. Howlett, pictures including an excellent view of the Houses of Parliament; and Mr. Chaug, hand-camera views; other slides were contributed by Messrs. Laurie, Greene, Sands, and Wellington.

The subject on Thursday, November 13th, will be a demonstration of the primuline process by Messrs. Green, Cross, and Bevan.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 30th.—Mr. A. HADDON in the chair.

The HON. SEC. announced the receipt of a prospectus of a Photographic Exhibition, to be held in Vienna during the months of April and May next, under the direction of the Vienna Club of Amateur Photographers.

Mr. C. J. ALDHAM showed some photographs of Indian life and scenery.

Mr. W. E. DEBENHAM read a paper entitled "The Unnaturalness of Naturalistic Focussing" (see page 862), and illustrated his remarks by diagrams on the black-board.

Mr. P. EVERITT said that by using an $\frac{1}{8}$-inch stop, as advocated in the paper just read, a different picture was obtained from that seen by the eye; the aperture of the eye was not used for definition, but to limit the quantity of light. He contended that Mr. Debenham had approached the subject from an optical point of view only, which was likely to lead to error and confusion.

In reply to Mr. Debenham, a paper was read by Mr. A. COLLIER (see page 870).

Mr. T. BOLAS said that, in estimating the merits of a photograph, the judgment should not be influenced by the size of the diaphragm used when taking the picture. Fine art was the absolute manifestation of the perfectly unfettered mind; it ceased to be fine art when conventionalism or commercialism stepped in. Emphasising the leading feature in a picture rendered it more pleasing, and was the aim of the artist. Remarking upon the quickness of accommodation of the eye to give maximum sharpness in various planes, he proceeded to draw a comparison of the performance of a lens and that of the eye.

Mr. EVERITT contended that the parallel referred to, between the lens and the eye, was not complete. He produced a piece of thin card with a pinhole pierced in it; by placing this close to the eye the print of a newspaper was rendered visible at a very close range.

Mr. NEWMAN said that the artistic mind frequently had a difficulty in reconciling optical laws and rules; generally it was the aim and practice of a photographer to give definition in all the planes of his picture.

An animated discussion followed, in which many of the members took part.

It being past the usual hour for closing the meeting, it was decided to continue the discussion at the next weekly meeting.

THE LANTERN SOCIETY.

AT the second meeting of this Society, held on Oct. 27th, Mr. LOUIS FAGAN gave a lecture on "Wood Engraving." Speaking of its history, he said it was known in very early times in the East, and was probably first practised by the Chinese. The epoch of its introduction into Europe was unknown, but it was probably introduced by the Saracens. One of the earliest uses to which it was put was in the manufacture of playing cards, and there were shown on the screen slides of some remarkable cards which were cut by a French artist, and which were discovered in Peterborough Cathedral. Several slides were then shown of early specimens of wood engraving; amongst them was one of St. Christopher carrying the

infant Jesus across an arm of the sea, by a German artist, dated 1483, and a most superb specimen of the celebrated Psalter of Faustus, which was printed from blocks on vellum, and of which only seven copies are known. The lecturer then proceeded to explain the method of "cross hatching," showing a magnificent example from the frontispiece of a book published in Mentz in 1486. Slides of chiaroscuro drawings were next shown, and the method of printing from different blocks to obtain the finished result explained. Speaking of Albert Durer, Mr. Fagan observed that he transformed the art of wood engraving, and several very fine specimens of his work were shown on the screen. Two very remarkable slides were shown of the frontispiece of the "Great Bible," printed by order of Henry VIII. The first of these has on it two coats of arms, one of them being that of Cromwell; in the second, the arms of Cromwell have been removed, leaving a white patch on the picture, he having been charged with treason during the interval between the publishing of the first and second blocks. Mr. Fagan concluded by showing examples of the work of Holbein, including some beautiful slides of the "Dance of Death," the finest work of art of its period.

Yarmouth and Eastern Counties Photographic Society.

The first monthly meeting of this Society was held in No. 3 Room of the Friendly Society's Hall, Middlegate Street, on Tuesday evening last. The President (Mr. Arnott) occupied the chair.

The first business was the confirmation of the action taken by the Secretary in securing the room in which the meeting was then held. Such a course had become necessary in consequence of the high charge made by the Corporation for the use of the supper-room in the Town Hall.

After several new members (including Sir Henry Tylar, M.P.) had been proposed and elected, the President read a paper entitled, "Elementary Photography," in which he not only touched upon points necessary for a beginner to know, but upon others with which the more experienced amateur should be familiar. A good discussion followed.

It was agreed that the meeting to be held on the 2nd of December should be devoted to the exhibition of lantern slides prepared by members only.

The Bath Photographic Society.

The first ordinary meeting after the recess was held in the new lecture hall of the Royal Literary and Scientific Institution on October 29th, Mr. W. Pumphrey in the chair.

Mr. F. J. Saunders was elected a member of the Society, and the election by committee of Miss Pearcey and Mr. A. Hinton Jones was confirmed.

Mr. Friese Greene then read a paper on the subject of a new machine for rapidly printing by means of photography (see page 868). The machine and the work done by it were examined with great interest.

Mr. Friese Greene also exhibited two novel forms of flash-lamps, in which successive charges of magnesium were fired with ease and certainty. Whilst Mr. Greene was speaking, a member photographed the auditory during one of the flashes.

The Chairman thanked Mr. Greene for his paper and trouble in bringing the machine down from London that evening. He (the Chairman) was amazed to hear that positives might shortly be obtained therewith from positives.

The secretary (Mr. W. Middleton Ashman) asked the lecturer the speed value of the films, and the light used in producing the pictures shown. He also wished to know how primuline compared in sensitiveness with the silver haloids, prepared for a high degree of sensitiveness to light.

Mr. Greene used gaslight for printing the band, and the sensitive surface was most rapid. Primuline was vastly less sensitive; perhaps what he obtained with silver bromide in a fifth of a second would, with primuline, require thirty seconds or more.

Mr. C. H. Talbot showed some early specimens of his father's work previous to despatching same to the Edinburgh Society. He also presented a copy of Fox Talbot's "Photogenic Drawing" to the Society.

The Chairman handed two handsomely bound volumes of a photographic journal to the secretary as a contribution to the Society's library.

Messrs. J. Dugdale and Davis then showed, by means of the oxy-ethyl limelight, a large number of transpareucies. The disc was about 11 feet in diameter. The subjects included a small series of local pictures, negatives and transpareucies, made by Mr. H. P. R. Wells, on bromide plates; a series of wet collodion transparencies, made by Mr. Dugdale, from negatives taken at the Society's outings during the past summer; also a series of Mr. Dugdale's slides (plain and coloured), illustrating places at a distance. Altogether about 170 slides were shown in little more than an hour.

The Sheffield Camera Club.

A lecture on Norway was given, under the auspices of this Society, on the 29th of October, in the rooms of the Club, by Mr. W. Lamond Howie, F.C.S., of London. The subject was entitled, "Ten Days on the Hardanger." The lecture was illustrated with a series of views photographed by Mr. Howie, and exhibited by a powerful oxy-hydrogen light, and embraced street scenes, many examples of the grander scenery—glaciers, valleys, mountains, waterfalls—as well as characteristic native costumes, and also interiors of dwellings and customs of the inhabitants of the Land of the Midnight Sun. A number of slides illustrating the journey to the Vozingfos reproduced vividly the difficulties of travel on these rugged valleys, and culminated in a view of the rainbows which form in the spray of the great fall.

The Oldham Photographic Society.

The following are the officers of the above Society for 1890-91, elected at the annual meeting held October 31st, in the Oldham Lyceum:—*President*—Mr. Tom Heywood; *Vice-President*—Mr. Wallace Thompson; *Treasurer*—Mr. William Schofield; *Committee*—Messrs. James Brooks, John Chadwick, Edward H. Dixon, John Fullalove, John Greaves, Jun., and William Jackson; *Librarian*—Mr. James H. Prestwich; *Hon. Secretary*—Mr. Thomas Widdop, 16, Burnaby Street, Oldham; *Assistant Secretary*—Mr. William A. Nash, 23, Queen's Road, Oldham.

The twenty-third annual report was read. The treasurer's account showed a balance in hand of £16 12s. 7d. During the past year each member has been presented with a 15 by 12 platinotype print, entitled "My Mammy," the work of Mr. Winter, of Derby. The average attendance at twelve monthly meetings has been about thirty-five members. The Society, during the past year, has lost one of its oldest members, Mr. George Hall, who, during his twenty-three years' membership, occupied the various offices of president, treasurer, and secretary, and was one of the founders of the Society in 1867.

The Liverpool Amateur Photographic Association.

A meeting was held on the 30th of October in the Club Rooms, 3, Lord Street. Mr. Paul Lange presided. Messrs. Robt. Thomson, Alex. Sinclair, A. Quayle, and Rev. W. Smith were elected members, making in all forty-six new members this year.

Mr. John Howson then read a paper on the working of "Alpha Paper," in which he treated on the following points: Objections to developing papers disproved; choice of colours and choice of surfaces of papers; necessity for care in exposure; permanency; latitude, modifications to produce best results from certain negatives; hints on toning; and concluded with a demonstration, in which a number of prints was made from various negatives. Mr. Howson stated that many people said that half-tones were lost with this paper, but the productions that evening had proved that this was not so. The emul-

sion on paper and plates was the same, and any colour could be obtained in the toning, which was with the ordinary alpha paper touing bath. Exposure should be made by scale, and not by guesswork. The burner used was an argand two-light at a distance of ten inches. After developing, the prints were placed in an acid bath without previous washing, then thoroughly washed and toned, and fixed in the combined bath such as used for aristotype papers.

The proceedings closed with the exhibition of the new Boston (U.S.A.) Camera Club's set of slides, entitled "A Ramble in and about Columbus" (Ohio), the lecture being given by Mr. J. A. Sinclair. A set of slides taken on alpha plates was thrown on the screen, and Mr. Paul Lange's "Channel Fleet" studies ended the show.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held on Wednesday evening, October 1st; the president, Mr. JOHN G. BULLOCK, occupied the chair.

It was resolved that the agreement heretofore existing between the Society of Amateur Photographers of New York, the Boston Camera Club, and the Photographic Society of Philadelphia, to hold annual joint exhibitions of photographs, be hereby cancelled, and in place thereof it is agreed that each organisation will hold a public exhibition of photographs, open to all photographers of the world, every third year. These exhibitions are to be held annually in rotation in each of the three cities, as before, but each exhibition will be under the entire control and management of the society holding the same, and under such rules at it may adopt. Each society further agrees that it will not hold any public and open competitive exhibition except in its regular turn, as above, without the consent of the other two societies.

Mr. STIRLING, for the executive committee, reported the receipt of a fine collection of photographs, the work of Mr. H. P. Robinson. The pictures had been hung on the walls of the meeting room, where they would remain on exhibition throughout the month of October.

The PRESIDENT mooted the subject of a communication which had been received from the Syracuse Camera Club, about the holding of a convention of amateur photographers. After a brief discussion, Mr. Coates moved to refer the matter to the executive committee, with power to act.

Mr. CARBUTT gave a brief account of his recent trip in Europe. He had given most of his attention to sight-seeing. In London he had noticed that the tendency in cameras seemed to be towards hand-cameras rather than stand cameras. He had seen several cameras to hold plates in magazines in London, and several on the Continent. He had brought two or three home, and would show them at some future meeting. In Scotland, the work he saw by professionals in Glasgow and Edinburgh was remarkably fine. A great deal of attention was being given to the production of pictures in platinum. In Edinburgh the pictures by Lafayette were among the very best in photographic and artistic excellence. The pictures were no doubt worked up with India ink, but there was a softness, yet force, about them rarely seen in photographic prints. In London he did not see much in the way of improvements in pictures. Platinum was being used there to a considerable extent. The technical quality of the work did not come up to the best class of work in America. The pictures in Paris, Geneva, Vienna, and Berlin portrayed a great deal of artistic feeling in the drapery and models. Many, in producing these, do not give the same care to the technical parts of their pictures as Americans. On the journey from Paris to Munich he had encountered rain all the way. At Lucerne he made an exposure in the rain while his son held an umbrella over him. He went up the Rigi, and made one or two exposures of the shivering mortals who were there waiting for the sun to rise. In Vienna he made a few exposures among the markets. The amateur photographers in Vienna have a very large, flourishing society, and are doing a great deal of investigating work. They meet once a month for regular work, and have a social meeting every Saturday night.

Answers to Correspondents.

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

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

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

B. G.—*Permanence of Diazotype Prints.* This point was discussed at the meeting of the Society of Chemical Industry on Monday last, but the evidence is not yet quite conclusive. There seems to be good reason for believing they are fairly permanent, but one of the members brought up a specimen to show that, under some circumstances, they were affected by light. With the new developers improved results have been obtained, and it will now be necessary to try these also; the winter season is not, however, a favourable time for such trials. We have not seen the article to which you refer.

REX.—*Studio Particulars.* The size, 18 by 7 feet, is rather small, and the district surveyor may require you to limit these dimensions still further by keeping a certain distance within the party walls. Of course, your apparatus and lenses must be in proportion, and backgrounds of the simplest character. We can hardly give you an estimate off-hand, but, with a trade catalogue, all the needful accessories could be priced so as to get a rough idea of cost.

J. P. (Oxon.)—*Sulphite as Preservative.* When you add nitric acid to sodium sulphite, an equivalent quantity of sulphurous acid is undoubtedly liberated, and this will act as a powerful preservative. The best condition would be insured by adding the acid in such proportion that not the whole of the sulphite, but only part of it, should be decomposed.

W. J. (Bolton)—*Vignetting in the Camera.* To take a portrait negative bearing its own vignette, the method of exposing with a movable screen in front of the sitter has been sometimes resorted to. The flat surfaces should be painted black and white, so that it may be turned round to get different effects, and always kept slowly moving when in use.

B. PHILLIPS.—*Black Tones in Printing.* These may be got as easily with the borax or acetate bath as by any other formula. The whole point consists in pushing the toning process beyond the chocolate stage, either by using a full dose of gold, or allowing a longer time. Twenty grains of acetate of soda, and one grain of chloride of gold, in about eight ounces of water, are the usual proportions.

L. T.—*The Photographic Exhibition.* Wednesday next, 12th inst., will positively be the last day for visiting the Pall Mall Gallery. It is quite worth a journey to come up and see it, if you have any regard for your art education.

PAT.—*The Kodak in Court.* It was not so much the use of the camera, as the attendant circumstances, which gave offence. Write out your views and send a communication to the Editor. There was no need for the counsel to take the portrait, but anyone near him could have done so. We cannot very well discuss it in this column.

H. S.—*Chemical Formula.* They are the same substance although expressed by different formulæ; you must remember that the atomic weights of oxygen, sulphur, &c., have been doubled.

LIVERPOOL PHOTOGRAPHIC EXHIBITION.—The arrangements for the triennial Exhibition are reported to be making good progress. The Exhibition will be held in the Walker Art Gallery, the use of which has been granted by the Liverpool Corporation, the same suite of five rooms as was used in 1888 having been secured. The opening is fixed for Friday, March 6th, 1891. Full particulars will be duly advertised. The judges will be Capt. Abney, Messrs. J. Gale, H. P. Robinson, A. W. Pringle, J. P. Gibson, and Watmough Webster.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

PHOTOGRAPHIC AIDS TO SCIENCE.

A LETTER in another column from Mr. Osmund W. Jeffs, secretary to the committee of the Geological Section at the British Association at Leeds, forms one among many other examples which can be brought forward of the daily increasing demand for photographic aid in scientific research and scientific teaching. This fact was never more prominent than at the Leeds meeting of the British Association, when that organisation gave more time to photographic subjects than it has ever devoted before.

In the Geological Section, throughout the week of the meetings of the Association in Leeds, an exhibition of geological photographs was open to the members, and it was probably the first exhibition of the kind which has ever taken place. The movement was started by the Yorkshire Naturalists' Union, which formed a section, with Mr. J. E. Bedford as secretary, to take the work in hand. Yorkshire contributed about one hundred of the photographic views of geological subjects, all of which were on view in the Exhibition. Other contributions were sent in from other counties, and Mr. Jeffs was particularly energetic in the promotion of the work. The idea is to obtain pictorial records of temporary geological sections, which sections may be lost by falling in, or by getting covered with herbage, or by removal—as in the example, for instance, of stone quarries. About two hundred geological photographs altogether were on view, mostly of somewhat large size; a few of them had been turned out by the collotype and other permanent processes. One of the most remarkable consisted of the broken stems of large trees fossilised, which had been laid bare by excavation. The upper parts of the trees had all been cut off ages ago by some of the forces of nature, but the remainder of the stony park is now open to the light of day. The late Lieut. Frederick Ruxton, who passed much of his time in the Wild West with trappers, all in constant danger of their lives from attacks by hostile Indians, narrates how one of the trappers, Black Harris, was not noted for veracity, and in narrating his adventures to a lady in civilised regions, added: "And scalp my old head, marm, but I've seen a putrefied forest!" "La! Mr. Harris," was the rejoinder; "did the leaves and the trees smell badly?" "No, marm," said Mr. Harris, condescendingly; "would a skunk stink if he was froze to stone?" Had Mr. Harris seen the tree stumps represented in the photograph, he would have been nearer the truth than was his intention.

The Geological Committee wants photographic societies to aid it in its work, but so far has not received much assistance from them. The Leeds Photographic Society, and the Thoresby Society (Antiquarian) have appointed a joint committee to photograph old houses in Yorkshire; some step of the same kind might be taken for the production of pictorial geological records.

In the new Observatory near the top of Mont Blanc, the meteorological conditions of that high region are, during the summer months, registered by self-recording mechanical instruments, which can be visited occasionally by assistants. Photographic self-recording instruments are not used, we learnt at the British Association, because they are so costly in the first instance; it is admitted that they do slightly better work than the others. The Observatory was constructed at Chamounix, and put together on the mountain. It cost only £32, but other expenses brought it up to £400. The apparatus it contains will go on working by itself for fifteen days, thereby recording information as to what meteorological changes go on there at an elevation of three miles. Mr. Rankine, the founder of the Blue Hill Observatory in America, has taken several photographs of the Observator near the top of Mont Blanc.

Professor Rowlands, of the United States, exhibited to the Physical Science Section of the British Association a photograph of the spectrum twenty feet long, the length of the original negative. He has been for some time working on the spectrum, chiefly in relation to exact measurements of the solar lines, and he publicly stated that the presence of silicon in the sun had been determined chiefly by photography. There is silver in the sun, and beryllium has quite recently been discovered there; it is doubtful whether uranium is present.

One morning, in the Physical Science Section, Dr. J. W. L. Glaisher, the president, drew attention to some large photographs on opal plates by Mr. Friese Greene, representing the sun and clouds; he said that the photographs were of an exceedingly beautiful description. Mr. Glazebrook stated that the direct negatives of the sun had been taken through yellow glass, and Mr. Symons said that they were equal to the best photographs he had seen. He stated that once an exceedingly curious photograph had come under his notice; the roof of a house had been raised by the wind, and the end of a flapping window-blind then came between the top of the house-wall and the raised roof; the latter fell back into its place, and the end of the window-blind was left sticking out between the top of the house-wall and the bottom of the roof. This result was photographed.

As a closing instance of the increasing use of photography to science, as exemplified at the last British Association meeting, it may be stated that the Committee of the Physical Science Section recommended the managers of the Association to appoint a Committee on Astronomical Photography, and this, we think, has since been done.

SENSITISED PHOTOGRAPHIC SILK.

A LITTLE paragraph recently published in these pages about the introduction into the market of some photographically sensitised silk, brought forth a number of letters of inquiry, in some of which the writers stated that, for several years past, they had been unable to purchase any anywhere. Years ago it was obtainable. Last week we received specimens of the prepared silk from the makers in Paris, and we believe that it is now sold by several English dealers. The manipulations of the prepared silk in the printing operations are so much the same as those of printing upon ordinary ready-sensitised paper, with the exception that the toning bath is of half strength, that there is really nothing to say about them. The results we have obtained with the silk are good, and elegant in appearance.

The manufacturers of the prepared silk, on "the Tisseron system," now under notice, say that, if protected from light and moisture, it can be preserved several months. It is of three colours—white, light blue, and pink—and the back of each piece is marked with pencil. The prints are fixed in a one in ten parts newly-prepared solution of hyposulphite of soda, in which the prints are left for ten minutes. They have next to be washed for some hours in water, and left to dry; then to be damped and gone over with a hot iron. When it is desired to paint the resulting prints with water-colours, the latter should be used with five parts of alum dissolved in a thousand parts of water.

The silk is said to print more rapidly than ready-sensitised paper. The samples sent to us do not do so to a noticeable extent; but comparative experiments might, perhaps, indicate a difference.

LANTERN SLIDE MAKING.

ALL men have their own theories and pet methods of working, and among photographers the rule certainly holds good, for very few among them will agree upon the precise formula by which development, or any other operation, is best brought about. In no department of photography, perhaps, is there greater divergence of opinion than there is concerning the best process for producing transparencies for the optical lantern. Old workers will—perhaps naturally—pin their faith to the wet process, and will assert that no other method will give such uniformity and certainty of result, and as proof of what they say they will point to the circumstance that the best known producers of commercial lantern slides hold fast to the old process. This does not necessarily prove that the wet process produces the finest results, although it is strong evidence that it is so reliable and certain in its practice that the work can be left to assistants who are rule-of-thumb men rather than experts.

The collodio-bromide process has also a large number of worshippers, and it must be at once conceded that this process is capable of the very finest work in the way of lantern slides. It is, however, a far more difficult process to work than the wet collodion method, and involves so many operations and so much care, that the printing of a dozen slides by its aid is quite a serious undertaking, involving the expenditure of much time. In making this statement, we are supposing that the worker has his emulsion ready-made, but that he edges, coats, dries, exposes, and develops his plates. The old albumen process also has its votaries, and it certainly possesses advantages which are not common to other photographic methods, in that the finished film is as clear and nearly as hard as glass, and is practically imperishable. A worker with this process whom we know told us that he once tried the experiment of submitting a gold-toned albumen slide to the heat of a muffle, with the result that the image was actually burnt into the glass. But no one can attempt to make slides in albumen unless he is an ardent experimenter, and is content to make his own plates, from the cleaning of the glass to the finished picture. Their beauty and lasting qualities are undeniable, as anyone is aware who has in his possession some of the orginal stereoscopic pictures by Ferrier, of Paris, which had such a large sale about a quarter of a century back.

But we are all in such a hurry in these more modern days, that we are apt to lose patience unless we can see results rapidly growing under our hands. The old type of experimental worker is well nigh defunct, and his place knows him no more now that every want is met so rapidly by our energetic manufacturers. It seems only the other day, although it is quite eight years back, that a small controversy had arisen round the question whether it were possible to produce a good lantern slide on a gelatine plate. A few ardent workers who made plates for themselves of the right quality answered this question unhesitat-

ingly in the affirmative, and proved, by the excellent pictures which they exhibited, that they were right. But the great majority who tried what could be done with ordinary plates made for negative work showed only dull and flat pictures with dirty high lights, and at once said that gelatine was no good for this class of work. At last the demand for a good lantern plate put the makers upon their mettle, and plates for lantern slides began to be an article of commerce, for which an enormous sale was at once secured. Hundreds of workers have since proved that these plates will give beautiful pictures, but they require care and common sense in their manipulation. They are certainly the very best plates for those who only want to make a transparency occasionally, for they can be purchased ready-made, and their exposure and development are very rapid affairs.

Two sorts of lantern slide plates are now in the market, one being coated with a bromide of silver emulsion, and the other with chloride. The makers do not all state by which process their plates are prepared, but there is no difficulty in distinguishing the chloride plate by its translucent film, and by the orange colour which it has by transmitted light. We ourselves prefer this description of plate to the other, as we believe that it is, on the whole, easier to manipulate, while by altering the developer a wonderful range of tones can be obtained in the finished picture. But it will only yield the best results if the exposure be made to daylight, for the emulsion is very insensitive to artificial light. Chloride plates are also unsuitable for copying work in the camera, when a larger negative has to be reduced to lantern plate size. For these reasons the bromide lantern plates have by far the larger number of admirers, especially among amateurs who have no daylight to devote to the making of lantern slides. The work has a great fascination about it, and there is no cause for wonder that it should have become so popular. Not only are the manipulations full of interest, but the finished result, when projected by the lantern on a screen, shows off the beauties of the original negative in a manner with which no other printing method can compete.

The Year-Book.—We have to thank the numerous friends who have kindly sent us articles for the Year-Book for 1891, now in the press. So many articles of good quality, by the best writers connected with photography, have been received that the number of pages of literary matter in the book has been considerably increased. Among the illustrations is a picture of the developing room at the Royal Institution; some of the others are produced by recent improvements in certain photo-mechanical processes.

The Decimal System in London Schools.—Some time ago a memorial on the decimal system was presented to the London School Board by the Decimal Association. The Board have now informed the Association that, on the recommendation of the School Management Committee, they have asked the Education Department to modify Schedule I of the new Code, so that decimal fractions shall be taught in the fourth standard at latest, and the metric system of measurement and weight be included in the teaching of the fourth and upper standards. The School Management Committee of the Board have also decided that models, illustrating the metric system, shall be added to the Board's requisition list in the event of the Education Department accepting the proposal of the Board.—*Nature*.

THE PRODUCTION OF STEREOGRAMS ON GLASS.

BY H. E. GUNTHER.

At the present time, when the stereoscopic picture, a most beautiful and realistic reproduction of nature, is being revived and rendered popular again, a few words on the making of stereoscopic slides, or a communication of what has been found the most satisfactory and reliable mode of working by some of our ablest and most skilled workers in this branch of photography, will not, I am sure, be deemed out of place.

Two remarkable communications on the above subject have been published of late, the one being a description of some of the best processes, by Dr. Miethe, the other a paper read before the Berlin Photographic Society by Captain P. Kiss. On these two publications, which are most exhaustive, the following remarks are based.

The negatives are taken on gelatino-bromide plates of ordinary sensitiveness: for landscapes, however, erythrosine plates are used. They should be coated as cleanly as possible on not too thin glass plates, so that they can be easily cut with the diamond. The size of the plates used is 13 by 18 centimetres. The negatives should not be too hard, but it is of no consequence if they are slightly fogged.

As is generally known, the negatives are to be cut for printing; this is done in the usual manner, the two halves being then labelled with "right" and "left," so that in printing they cannot be changed. For printing the stereoscopic negative, gelatino-chloride plates with development are preferred by Dr. Miethe to the printing-out plates of the same kind, and the following formula, due to Professor Eder, is recommended by him as excellent and thoroughly trustworthy:—

Solution A.

Sodium chloride (dry)	14 grammes
Gelatine (hard)...	25 ,,
Water	200 c.c.

Solution B.

Nitrate of silver	30 grammes
Water	50 c.c.

Solution C.

Gelatine	25 grammes
Water	200 c.c.

Solution C is, at 122° F., poured quickly into solution B, solution A being then added at once. The emulsion is then vigorously shaken, and poured into a dish for setting. It is important that the emulsion sets quickly, this leading to a warmer tone in development, and, consequently, to a richer gold tone. A warm tone may also be obtained by adding to the emulsion from 10 to 20 grammes of citric acid. After setting, the emulsion is, as usual, squeezed through canvas, very thoroughly washed for at least two hours in running water, and filtered at 104° F. The whole mass is then poured on, at 122° F. Although, if poured on transparent glass, the emulsion looks exceedingly thin, it gives good density. The plates are printed by lamplight for forty to sixty seconds at a distance of one foot from an average paraffin lamp, or for two minutes by candlelight. The longer the plate is exposed, the redder will be the final tone, and, at the same time, the image becomes softer. The best developer for these plates is the following:—

Hydroquinone...	2 grammes
Sodium sulphite	8 ,,
Carbonate of soda	8 ,,
Water	500 c.c.
Sodium chloride	5 to 8 grammes

Fixing is done in a solution of hypo from 1 : 10 to 1 : 15. The plates are then again washed, and toned. For toning, the following method is recommended by Dr. Miethe as the only one giving good results:—

Water	... 1,000 c.c.
Ammonium sulphocyanide ...	... 20 grammes
Hyposulphite of soda	... 1·5 ,,
Chloride of gold solution, 1 : 50	10 to 15 c.c.

If the toning proceed too slowly a little more gold chloride may be added, but care should be taken not to add too much, because, in this case, an uniform purple tone is hardly to be obtained. The above toning bath keeps well. After toning, the plates are rinsed, dusted off with a soft brush, allowed to dry, and rubbed in with a rag on which a drop of linseed oil has been given. This renders the shadows of the image more transparent.

Of the above-described printing process with gelatino-chloride plates, Dr. Miethe says that it is as beautiful as it is convenient and reliable, and, from our own experience, we can confirm this. Captain Kiss, who prints his negatives also on gelatino-chloride plates with development, mentions that, in preparing the above-described emulsion, he takes two-thirds of soft and one-third of hard gelatine, which he soaks in distilled water for about one hour, then washing it in three or four changes of water; finally in distilled water. To 30 grammes of silver nitrate solution he adds 5 drops of diluted nitric acid (1 : 10 water). Before melting the emulsion, he adds 5 drops of diluted hydrochloric acid (1 : 5 water) to 30 grammes of silver nitrate.

During coating, the plates should be warmed up to 77° or 86° F. A plate of 8·5 by 17 centimetres requires 6 c.c. of the emulsion. Kiss observed that the prepared plates do not keep for any long time: after a lapse of a fortnight fog made almost always its appearance at the edges of the plates.

An original method of developing the gelatino-chloride plates has been worked out by Captain Kiss. In employing it, the toning process, which is always a rather tedious and difficult operation, may be entirely omitted; besides, it gives absolutely clear whites. This is of importance, inasmuch as, by the slightest trace of fog, the pictures will considerably lose in appearance. The formula recommended by Kiss is the following:—

Solution A.

Citric acid	... 60 grammes
Carbonate of magnesium ...	... 8 ,,
Carbonate of ammonia (in pieces)	... 26·5 ,,

are put in a glass cup, and covered with distilled water. This combination forming a freezing mixture, it is well to place the cup in luke-warm water. The solution of the ingredients, during which carbonic acid escapes, being complete, distilled water is added to make 240 c.c.

Solution B.

Sulphate of iron	... 28 grammes
Distilled water	... 96 c.c.

Citric acid, a small crystal 5 to 7 millimetres large.

Solution C.

Sodium chloride	... 5 grammes
Water...	... 150 c.c.

Solution D.

Hyposulphite of soda ...	... 1 gramme
Water	... 20 c.c.

To develop the stereoscopic picture, mix—

Solution A	... 45 c.c.
Solution B	... 15 ,,
Solution C	... 3 ,,
Solution D	... 1 drop

The addition of a very small quantity of hypo solution (solution D) has been found absolutely necessary in order to obtain an uniform tone; no good result is obtained without it. The resulting tone depends, however, as is known, much upon the time of exposure given, a short exposure leading to darker tones, a long exposure to brownish ones. If the developer is poured into a well-stoppered bottle directly after use, from four to five pictures may be developed in it in succession. Fixing is done in a hypo solution of 1:6 to 1:10. The plates are then washed for twelve hours in from five to six changes of water.

Plates of ground glass are usually employed in making the stereograms, the emulsion being applied to the smooth surface of the ground glass. As, however, it is difficult to procure well-ground, thin glass plates, at least unless a comparatively high price be offered, and other glasses, as, for instance, opal glasses, take off too much light, it occurred to Capt. Kiss to impart to the gelatine film of the stereograms a matt surface by squeezing them on to rough paper, rubbed in with talc powder, in the same manner as prints on gelatino-chloride paper may be rendered matt by squeezing them on talced ground glass.

The paper used for this purpose is a stout paper coated with a carbonate of calcium emulsion. It is rubbed in with talc powder, placed under water on the picture, and slightly pressed against it; after drying it comes off spontaneously, leaving the gelatine film with a matt surface. The paper can be used repeatedly. The following are the working details of the process.

Preparation of the Carbonate of Calcium Emulsion.—A. Soda Solution.—In 35 c.c. of water 37 grammes of chemically pure crystallised soda are dissolved, and the solution is gradually added with constant stirring to 21 grammes of gelatine (half soft and half hard) dissolved warm in 115 c.c. of water. B. Chloride of calcium solution.—9 grammes of gelatine (half hard, half soft) are dissolved warm in 50 c.c. of water, and 27 grammes of dry chloride of calcium are added to it and dissolved. The solutions A and B are allowed to cool down as much as possible, taking care, however, that they remain fluid. Solution A is then poured in small portions into solution B, the mixture being emulsified by shaking. After the scum has settled the emulsion is poured in a glass dish, and the latter is placed in cold water.

One of two methods may now be used. If a very fine grounding is desired, the emulsion, after setting, is freed from the adhering scum, then it is melted and filtered through a double layer of moistened cambric, which is tied up in the form of a pledget 2 centimetres wide, to a glass funnel. A part of the filtered emulsion is poured in a crystallising dish of about 12 c.m. diameter, the greater part remaining in a discharging pot. Both are placed on a warm plate. In the crystallising dish is put a flat brush about 9 centimeters broad. Meantime plates of finely ground glass have been rubbed in on the matt surface with talc powder and used hand-warm. In coating the ground surface of these plates with the emulsion, the flat brush full of emulsion is at first passed slightly over the plate, so that it is covered thinly, but all over, with emulsion, then the required quantity is quickly poured on, giving thereby to the cup a circular motion over the plate. The emulsion is then evenly distributed by inclining the plate, and the latter placed on a levelled marble or slate plate for setting. After setting, the plates are placed perpendicularly in a plate washing box, and, by repeatedly

changed water, freed from the salts contained in the emulsion.

According to the second method, the emulsion, after setting, is pressed to threads, and the latter are washed as usual, thoroughly dried, melted, and filtered, and coated as described above. After the plates have set, and after washing them, they are covered with the above-mentioned paper. For a plate of 13 by 18 cm., a sheet of mask paper measuring 20 by 25 cm. is taken; it is soaked in water, placed between blotting paper to free it from the superfluous water, and then gradually placed on the plate, beginning at one end, and taking care that air-bubbles are avoided; finally, it is slightly pressed against the glass plate with the squeegee. The projecting sides of the paper are folded on the back of the plate, and the plate is dried lying flat. When dry, the paper comes off spontaneously. The stereoscopic slide, after being sufficiently freed from hypo, is placed on a glass plate of 13 by 21 cm., and together with it laid in a trough filled with water. The paper, after being cut to the size of the glass plate, is rubbed with talc powder, well dusted, soaked in water, and under water placed on the stereoscopic picture, after the air-bubbles which might have formed have been removed by means of a hair brush. The glass plate, together with the stereogram and the paper, then being removed from the bath, the paper is slightly pressed against the stereoscopic slide by means of an india-rubber squeegee, and the sides of the paper projecting over the slide are fixed to the glass plate by laying strips of glass on the paper, and pressing them close to the glass plate by means of printing clips. The stereogram is then dried *lying* and at a place free from draught. After drying, the paper comes off, and the stereogram shows a mat surface. It is then provided with a covering glass plate and bound up as usual. The pictures produced by this process have the characteristic property that they appear equally sharp whether they are examined from the front or from behind.

I trust these few hints derived from the papers of Dr. Miethe and Capt. Kiss will be of use to those who, like the writer, are equally enthusiastic votaries of the stereoscope.

Impurities in Alcohol.—Pure alcohol is desirable for various operations in photography, and Dr. E. Walker, in the *Journal of the American Chemical Society*, has pointed out a hitherto unsuspected source of impurity. He finds that if it be kept for some time in tin cans it slowly reacts on the tin, giving after a while a cloud of oxide of tin so fine that it cannot be filtered out. Vessels of stoneware or glass should therefore be employed for storing alcohol.

The Liverpool Amateur Photographic Association.—The tenth ordinary meeting of the twenty-seventh session opened yesterday at the Association's club rooms, Crescent Chambers North, 3, Lord Street, Liverpool, when Mr. John Howson read a paper on the working of alpha paper. As regards the Association's prize competition for 1890, prizes consisting of silver and bronze medals will be awarded at the annual meeting in November for best and second best series of six pictures, without restriction as to choice of subject, for sizes half-plate and under, and over half-plate respectively; for best and second best series of two enlargements; and for best and second best series of six lantern slides. All work must have been taken during the year preceding the adjudication, and the negatives, development, printing, toning, and clouds (if any) must be the *bonâ fide* work of the competitor. For full rules, see the annual report. The following is the prospective programme of practical demonstrations on lantern slide making:—Nov. 12th—Mr. Isaac Knott, wet collodion process; Nov. 26th—Mr. Paul Lange, printing-in of clouds in slides; Dec. 10th—Mr. W. P. Christian, toning of lantern slides.

IS BLURRING DESIRABLE IN A PHOTOGRAPH?*

BY W. E. DEBENHAM.

In the paper on "The Unnaturalness of Naturalistic Focussing," read last week, it was pointed out that the desirability, as a matter of taste, whether occasionally or generally, of representing objects in the camera with the blurred definition of a lens out of focus, is a point that may be fairly argued, even though it may be demonstrated that such blurring does not represent the image of nature impressed upon the retina.

The question arises, What are the advantages, real or supposed, to be obtained by means of blurring the picture in whole or in part? A claim which has been put prominently forward is that, by placing all but the principal object in a picture out of focus, attention is attracted to that object, and it is recognised as the leading feature. Now, as a matter of fact, does the fineness of detail in any part of a picture cause that part to strike the spectator with the prominence implied by this argument? It does to some extent, probably; but the idea that fine detail is so potent in attracting attention, causing the part where it is present to be recognised as the leading feature of the composition, is probably due to the confounding of fine detail with decision of outline or harshness, both happening to be described by the word "sharpness;" photographers understanding detail by the term, whilst painters use it in the sense of decision of outline. If the part of the picture which is the sharpest photographically—being in best focus, that is—is thereby really made so predominant, we must take it that in Dr. Emerson's "Barley Harvest," the corduroy trousers and hobnailed boots of the sitting figure constitute what Mr. Everitt calls the *motif* of the picture. The sharp contrast between the faces of the figures and the sky will, I think, be generally felt to lead the eye to that part of the photograph rather than to the boots, although the faces are not, photographically speaking, so sharp—not so finely detailed, that is—as the hobnailed soles of the boots.

The difference between the two senses in which the word "sharpness" is used, which was pointed out in the previous paper, is illustrated in this photograph. The corduroy trousers of the sitting figure close to the boots are in good focus, finely defined, and, therefore, what a photographer calls sharp. The upper part of the figures and the scythe stand out sharply, as a painter would say, against the sky; and although not in the best focus, and, therefore, photographically not so well defined or "sharp" as the trousers, are more immediately striking as the leading theme of the picture.

A real gain that may arise in some special cases from the use of such a large diaphragm as to throw part of the picture out of focus, is when some foreground object has its outline obscured by lines in the background. Suppose the case of a horse with foliage behind. In nature we have the help of colour to enable us to separate the one from the other, but in the photograph the leaves and twigs are in places so much of the same depth of tone, that the outline of the animal is either partly lost, or, at all events, requires to be looked for. Now there are several artificial means which may be adopted quite legitimately to separate more distinctly the foreground object which we wish to represent from the background. One plan is to light a fire where the smoke will blow between the two planes, and thus dim the lines of the background.

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* A communication to the London and Provincial Photographic Association.

Another artifice that may be employed is to use the so-called naturalistic focussing—to use, that is to say, a stop large enough to put the background much more decidedly out of focus than it is seen by the eye to be. This method, indeed, will most likely be employed without the special intention mentioned when photographing anything so restless as animal life.

Other cases where advantages may be claimed for an out-of-focus representation, are where it is desired to idealise, as, for instance, in portraits or studies from the life, when the irregularities and asperities commonly existing on the skin are felt to be blemishes that it would be better not to include in the picture. There is no doubt, too, that we often see these skin marks more prominently in the photograph than in nature. The more perfect is the photograph in lighting and half-tone, the less will such asperities obtrude themselves, and it is, of course, open to argument that the crudeness and harshness due to imperfections of the photograph are more objectionable than the absence of the fine definition seen in nature, and that if losing the detail will enable us to obscure the harshness, it is legitimate to do so. The use of orthochromatic methods, and greater perfection in the photographic registration of half tones, will help to overcome the objection to detail, although, of couse, where it is desired to idealise, and to obscure what are considered to be defects in the original, artificial means of some sort must be resorted to, and throwing the image out of focus is one such means. In subjects of a portrait character, we find that artists more frequently avail themselves of the licenses both to use a certain amount of blurred definition in the subject, and a good deal of indistinctness in the background, than is customary in landscape and other paintings.

A departure from perfect definition of an opposite character to that implied by differential focussing was introduced by Professor Petzval in 1859. He showed how, by separating the components of the back lens of one of his combinations, the sharpness of the focal plane was destroyed by the spherical aberration thus introduced, and that out-of-focus planes not having sharp ones to contrast with, the blurring that existed in them did not strike the eye so prominently. He was careful, however, to describe this quality, which he called depth of focus—using the expression, however, with a different meaning from that of increased definition now generally understood by it—as an imperfection of the lens, and gave no countenance to the idea that there was any real gain of detail in the out-of-focus planes, but only an apparent gain by absence of contrasting sharpness anywhere. This line of argument has also been adopted by Mr. W. K. Burton and others.

Pinhole photography is another way—quite opposite to differential focussing—of obtaining a blurred effect. If the pinhole is small, the blurring is small also, and in a large photograph may be scarcely noticeable at all. A good deal may be said in favour of pinhole photography, particularly on the ground of the equality of definition all over the picture, and absolute freedom from distortion. An objection, of course, exists in the length of exposure necessary, but this does not come into the present discussion.

With respect to the image given by the pinhole, Mr. T. R. Dallmeyer, in a paper read at the Camera Club Conference, started a very strange proposition to the effect that the image given by it tended to exaggerate foreground objects. Dr. Emerson, in "Naturalistic Photography," had very justly observed that "the drawing of pictures taken in such a way would obviously be correct." He now appears, however, to have assumed that there was some foundation of scientific fact for Mr. Dallmeyer's proposition, for in *Photography* of August 21st last he writes that "the 'pinhole' picture is inadmissible, because the smallness of the aperture falsifies modelling and perspective."

When we are told that the details in all but one plane of the picture are too finely defined in photographs generally, and that it is more artistic to have them decidedly out of focus, we are naturally led to look to the works of recognised artists—painters and draughtsmen—to see how they represent nature. We then find that, with the exceptions before mentioned, painters generally give us a fineness of detail throughout the picture which we cannot in most cases rival in the photograph except near to the focal plane, simply from the fact that the use of such a small stop as would be required to imitate in this respect the handiwork of the painter would necessitate too long an exposure.

Take as examples familiar to photographers the photogravures of paintings now on exhibition at the Pall Mall Gallery. In the "Al Fresco Toilet," by Luke Fildes, we see not one face, but all the faces and figures, and not merely these, but the background, and even the vine leaves in the corner, so well defined that, if a photographer were to try to get equal definition in a study of figures similarly arranged, he would have to use such a small diaphragm that the lengthy exposure would almost certainly involve movement of some of the subjects. Take the painting of "Diana or Christ?" by Edwin Long, R.A. Will any one pretend that if he had a group of figures and natural background—the living scene, in fact—thus arranged, he could use a small enough stop in his lens to get the figures throughout so well defined as they are in his painting? Then look at the landscape by R. W. Leader, A.R.A., and see whether the definition throughout is more like that of the "naturalist" or of the photographer who tries to get as good focus as he can throughout the picture. These paintings are not exceptional in respect of detail, but represent the great majority of work of the best painters—subjects of a portrait character excepted—as before mentioned. If, therefore, Dr. Emerson is right in condemning the photographers who get what definition they can throughout the picture, he also condemns the painters whose work we naturally look to as ideals for photographers to imitate artistically. It is not to the point to say that photography will define more minutely than artists paint. This argument only applies to the part in focus, and does not apply to the great part of the picture, which, according to "the naturalist" contention, should be more or less out of focus. Moreover, although at the one plane the representation may be more minute in detail than the painter would think it worth his while to imitate, the difference in this respect is not necessarily either an objection, or even noticeable at ordinary viewing distance.

The fine definition of details in parts not desired to be prominent is often spoken of as though prominence was mainly due to the presence of fine detail. This is not necessarily so, and it is, indeed, generally speaking, due to the character of lighting or amount of exposure rather than to focus that details become objectionably prominent.

Criticism of particular pictures is distasteful and not conclusive, because a principle may be right or wrong,

independent of the character of individual results. Dr. Emerson, however, so challenges criticism by such statements as this is just as it should be, that one may be excused for specifying what seem to us to be faults in the models he puts before us. With regard to the photograph, "Where Winds the Dyke," one of our members, at a former meeting, remarked that if the lower part of the picture were covered, it could not be told what that which does duty for a tree was intended to represent. With such criticism possible, it certainly seems to be juggling with words to say that out-of-focus effect must be used, but not to the extent of interfering with structure. The "Marsh Pastoral" is certainly a pleasing picture, but rather, I think, in spite of that out-of-focus characteristic of one side of the picture than in consequence of it. If the sheep to the right of the picture had been in better focus, I believe the picture would be better, and certainly more like paintings such as those of H. M. B. Davis, for instance. Taking the work of painters generally, do not the photographs of Gale, England, and Bedford more nearly resemble them in general definition than do such productions as we are now bidden to look upon as the embodiment of the picturesque? Do they not also enable us to see better what exists in nature? If on both hands the answer is that they do, let us, at all events for general work, not abandon the old models for those now attempted to be set up.

A preference for the representation of the details of nature, as a general rule, does not involve a denial of beauty of its own kind as belonging to such works as those of Mr. G. Davison and the series of large head studies shown last year by Mr. Lyonel Clark. How far this special kind of beauty is esteemed in comparison with the beauty of the more fully expressed details of nature as seen in a finely focussed photograph, must be very much a matter of individual taste, and in any case we may admire the artistic power displayed in the selection and treatment of a subject, even if holding the view that a smaller pinhole would have yielded a result still more gratifying to one's own taste.

Don't use or be misled by catch words. "Pictorial definition" is an expression that has been taken up on the assumption that some sort of definition other than that recognised as being in focus, is entitled exclusively or particularly to the designation pictorial. "Biting sharpness," as applied to photographic lenses, is another catch word. The expression will not bear analysis, but it suggests something unpleasant in connection with fine detail, which may lead away the judgment of the casual hearer to the idea that unpleasantness is inherent in finely detailed work.

There are subjects and occasions, as has been stated, where a loss of detail may be desirable, but these are, in my view, the exception. With these exceptions, and with the understanding that "sharpness" is used in the photographic sense of fine detail, and not the painter's sense of accentuated outline, I believe that Captain Abney's proposition is thoroughly sound—that photographs should be sharp all over, and that a near object should be as sharp as a far-off one.

The next meeting of the Newcastle-on-Tyne and Northern Counties Photographic Association will be held in the Mosley Street *Café*, Newcastle, on Tuesday, the 18th inst., at 7.30 p.m. A demonstration of the platinotype process, by Messrs. M. Auty and J. Pike, will be given.

THE FOCUS QUESTION.

BY GEORGE DAVISON.

The focus question is now attracting a great deal of attention, perhaps more than it relatively deserves. It is just one of those points upon which every photographer feels he is qualified to express an opinion, whether this be based upon prejudice, or science, or artistic feeling. It is only this year that, owing to the prominent exhibition of some marked examples, any wide popular interest has been expressed on the subject, or that any merits in diffusion and out-of-focus treatment have been discussed and recognised by the rank and file of the body of photographers.

Of the importance of the subject I am convinced, but it seems to me that the bearing of merely optical phenomena upon the question has been over-estimated and too exclusively considered. The investigation of these phenomena is of great interest, but, after all, one is brought back to the conviction that the treatment in an artist's work is a matter of feeling, the result of complicated mental impressions, reactions, and analysis. He can be bound by no one limiting rule as to what he must do in all cases. What he may *not* do may be very clear, and doubtless, as in other matters in art, there may be found a principle which will forbid some particular method or methods of treatment. The one and the only broad contention I should feel inclined to make in this matter of focus in pictorial work, where the feeling and character of a subject are to be poetically given, is, that there must be no such detailed definition as the photographic lens can give. If photographs are to be presented as pictures, and not as scientific diagrams, they must not, under any circumstances, be detailed or sharp; and for the reason that no one ever succeeded in giving a fully spirited and pathetic rendering of a scene or subject, and, at the same time, troubled about the small particulars. In pictures the letter must be sacrificed to the spirit. No one has ever reconciled the two attitudes of the scientific investigator and the artist. Many painters paint somewhat sharp edges or limits to objects, but none of any note try to give the local facts definitely, as they could do if they wished. Those that have prided themselves upon their execution are of little repute in respect of the greater matter of feeling. Painters and photographers may begin by fine literal work, but the cultivated tendency is to broader treatment. As I have already suggested, it does not seem to be, even with impressionist painters, a matter of focus (this has not greatly entered into their study), but of suppression of definite detail throughout. They paint equally sharply or the reverse in representing all planes, but all, with one accord, use a broad treatment in order to drop out the commonplace and to ensure seizing the spirit and character of the subject. For this same purpose treatment by focus is the photographer's only means, and this is to me the great and leading application of the function. I do not say that painters' practice is to be taken universally as a guide. Focussing is one of those points which photography brings into prominent consideration, and painters may yet find many new lessons to be learned from photography, which shall materially affect their general practice.

Passing from this broad contention to the exact treatment by focus, my conviction is that this must be left to the artist, and must be determined by the attitude that the subject in hand compels—in some cases, differential focussing, in

others general diffusion, being felt to be preferable. To limit our methods of treatment without more knowledge concerning the operations of the mind, and a better demonstration of the necessity than at present has been put forward would, I think, be a mistake. Diffusion and differentiation have been made a subject for contention as to which is the truer on optical grounds. I do not see the necessity for an universal application of either. The artist may treat a subject, of which his impression will be vivid concentration of interest on one incident or object, or one in which the impression gained is of the general character and beauty of a landscape. Neither will be all truth, even on optical grounds; both may be representations as spirited and natural as are possible to a limited art. In differential focussing, that which settles the question as to which plane or portion is to be made the sharpest, *is the mental decision of the artist*, his feeling and selection. Similarly, it is his mental attitude which must decide whether to diffuse the focus or to differentiate it.

It has been contended by Dr. Emerson and Mr. Dallmeyer that differential focussing can be the *only* true, and therefore naturalistic, method of treatment, and that diffusion is inadmissible. I have, however, not been able to see that they have proved their case in either respect. Indeed, it would appear that the application of the term "natural" or "naturalistic" to the question of focussing is liable to lead to confusion. Most photographers seem to have the idea that naturalism means simply want of focus and nothing more. Taking into consideration, however, the application of mental focus, one kind of treatment may be argued to be as natural, though not necessarily as artistic, as another. Scientific investigators say it is a natural impression with them that everything is sharp. Such an impression may, no doubt, be registered on the mind by examination and the exercise of memory, and the mental picture be all over as sharp as the eye can see. This, it seems to me, may not unfairly be termed "natural." At the same time, it is not the attitude possible to the artist. It is the scientist's view of a scene, a catalogue in which all the items are minutely enumerated.

But, leaving this as a small matter, and looking at the question from the artistic standpoint, if I were tied merely to what could be demonstrated concerning optical phenomena, and if, at the same time, I were to decline to use any forced expedient for simulating the effect of binocular vision, I should feel compelled to work much sharper than I do, and with only a slight difference of focus in the planes, mourning the impossibility of using any natural and true means of giving the appearance of solidity upon a flat surface. If purely scientific principles are to govern us in respect of focus, then ought our pictures to be as Mr. Dennis Taylor has contended, namely, such as are given with an aperture of about $\frac{1}{8}$ inch, for I cannot see that differential focussing is anything but an expedient, a false way of rendering the effect of binocular vision. The inferior definition given by the eye as compared with the lens does not affect this point. On the other hand, our methods of representing natural scenes on a flat surface must be more or less compromises and artifice, and marked differential treatment may be held to give as near approach to stereoscopic relief as is possible in our art. It may be in that way an expedient for representing the artist's impression or mental focus of some subjects, but certainly I cannot see that binocular vision and contrast of focus can be claimed scientifically to be interchangeable effects. As a minor matter, it may be remarked that the contrast of focus which is forced upon the photographer in using the longer focus aplanatic lenses with large apertures is, as those lenses are at present made, often exaggerated and untrue, to say nothing of the frequently unpleasant character of the definition in the out-of-focus planes. I still think we want a lens to meet this difficulty.

In regard to the question of diffraction photographs, or pinhole pictures, Dr. Emerson objects to them on the ground that they falsify modelling, perspective, and tone. I favour them as giving the most pleasing softened quality of definition of any means as yet employed in photography, and because such diffusion seems to me fairly to give the impression as regards focus which the mind selectively receives from many subjects. There is an appreciable time required for focussing and refocussing different points, and in those cases where the impression is general, photographs of equally soft focus throughout may, I think, be accepted as giving the natural effect. I may say that the best pure landscape photographs of which I have any knowledge are photographs with diffused focus. I do not think there is any falsification of perspective in pinhole photographs, nor any appreciable falsification of tone. As regards modelling, it must be classed with the majority of lenses as used at workable apertures. It is merely a matter of degree between them. The quality of the definition is, in my opinion, of far greater importance than is generally given to it, and in this respect I find nothing to give such æsthetic pleasure as diffraction photographs.

Mr. Dallmeyer, in some of his admirable papers, goes, in my opinion, too far when he claims to have proved pinhole photographs to be inartistic. As already suggested, there is something more to be be considered than the optical phenomena attending the case of an eye fixed upon one point of sight. The question of art can hardly be settled in so direct and easy a way as that. At the same time, Mr. Dallmeyer gives some consideration to "mental focus," and I have found some difficulty in reconciling his statement made in one place that "if a scene is of uniform interest it should be recorded as such," with that in another paragraph that "pinhole photographs must be failures artistically." I have probably failed to understand Mr. Dallmeyer's exact meaning, but I can hardly believe he would contend that a landscape whose beauty lies in its general character cannot possibly form the subject of an æsthetically pleasing picture. He has said that "to portray a subject as the eye sees it, the chief plane of interest (why the plane?) should be better defined than the others." But *who* selects and decides which is "the chief plane"? The artist, of course; and, as I have already said, if he, from his mental analysis, finds the character and the interest general or uniform, to seize and express that best he may apply uniform softness of focus.

THE SOCIETY OF ARTS.—Among the lectures to be delivered during the coming session is the following:—Dec. 17—George Davison, "Impressionism in Photography"; and among the papers for which no dates have as yet been fixed:—"Methods and Processes of the Ordnance Survey," by Colonel Sir Charles Wilson, K.C.B.; "Fast and Fugitive Dyes," by Professor J. J. Hummel; "Photography in Aniline Colours," by Messrs. A. G. Green, C. F. Cross, and E. J. Bevan. Among the courses of Cantor lectures to be delivered on Monday evenings at eight o'clock, is one by Professor R. Meldola, F.R.S., "Photographic Chemistry"; three lectures—March 9, 16, 23.

NATURALISTIC DEFINITION.*

BY PHILIP H. NEWMAN.

Naturalistic definition cannot be in a greater degree a question for photographers than for the professors of any other graphic art which aims at the gratification of the sentiments through the organ of vision. Therefore, I cannot conceive of the question being conclusively settled on any parallelism between the human eye and photographic lenses, and it is matter of considerable satisfaction to find the subject removed this evening from the field of optics to its more legitimate one, that of æsthetics.

In considering this question of naturalistic definition, it will be well to clear the ground of all useless surroundings, and as it is before all things a fine-art subject, it is desirable to determine, if possible, what are the purposes of fine art. In the art of portraiture it is the endeavour of the artist, and within the possible scope of his art, to appeal to the beholder, not only with the more or less truthful representation of his sitters, but also of their mental as well as their physical characteristics. It must be quite understood that in saying this I am merely repeating accepted axioms based on the works and customs of the most celebrated portraitists of all times. If these axioms be accepted now, and the works I have alluded to be studied in relation to the question before us, it will generally be found that every other object or accessory in the portrait but the person represented is duly subordinated to it. That the result has often been admirably effected by photographers goes without saying; and I suppose this success has not a little depended on the possibility of adjusting their greatest powers of definition to the features of their sitters, letting other and subsidiary matters remain more or less out of focus.

Now I think it must occur to most of us contemplating this question of definition from the æsthetic standpoint, that a parallelism to the rules applying to portraiture must be looked for to some extent as holding good in the treatment of other subjects in art. Let us take, for instance, a group of figures, presupposing, of course, that these have been selected and posed with some regard to linear harmony and composition. It would seem that the first consideration is to represent them as in relation to one another in a contributory sense to some action or sentiment. If this be allowed, it follows, as in the case of portraiture, the environment, though contributory to the general effect desired to be produced, must be of secondary import, and not necessarily so well defined as the figures themselves. Indeed, the importance of the group is really emphasised, not by the actuality of the surroundings, but by their suggestiveness. Of course, one is not prepared to say that this has been invariably the mode of treatment adopted in all artistic representations at all times, but I think it must be allowed that the purposes of illustration are best served by filling the mind of the spectator with the main subject of the pictorial drama, rather than equally with the accessories, as much is gained by telling the story, whatever it may be, with directness. If this principle of due subordination has not been adhered to in the methods of all painters, it must be borne in mind that circumstances alter cases, and the pictorial is not suited to all purposes of art, and it is enough for us to remember that it is the principle invariably followed and adhered to in that most important school of *genre* painters to which photography, in scale and general range of subject, may be most naturally affiliated—I mean the Dutch school.

In the treatment of pure landscape there are, and always will be, those who ignore art altogether, and insist that the physical fact is of the same or greater importance than the mental aspect. With these we happily have nothing to do. We will rather deal with those who, not content with subordinating the receding planes in deference to an agreeable ærial perspective and the custom of the greatest landscapists, would, by means of a pinhole or other blurred focus, make the entire work accessory, so to speak, to a plane of greater or less definition in the beholder's brain. This may be conjuring, but it can scarcely be called fine art, whose highest attribute is to call up sympathy between the beholder and the creative or interpretative spirit. The class of works I am alluding to are called "impressionist," and besides their not being in general convincing to the spectator, cause him frequently to doubt whether they truly reflect the conviction (if any) of the artist himself, so that that sympathy I have stated as a characteristic attribute of fine art rarely, if ever, can have effect. It has always seemed to me that the laws of harmony in the graphic and glyptic arts are as inexorable as those which govern that of music; and it may justly be observed that the aim of the greatest composers, however variable in their harmonies and instrumentation, have held the end constantly in view that their greatest art is in contributing and giving value to thematic expression. Neither Beethoven, Schubert, Mendelssohn, nor Wagner blurr their main idea or motive, but strive to impress it on the ear and mind by the judicious background of contributive harmony.

Whether photographers will continue to take notice of the erratic works that have brought about this discussion, or allow themselves to be seriously influenced by them, is for the photographers to decide; but the aspects of the question to the outside public, if worth consideration, are simply these:—In the first place, whether the highest aim of one art can be allowed to be the more or less feeble imitation of another? (I refer here to some recent public exhibits); and, secondly, whether photography is properly understood by photographers whose foreground definition is so suggestive of fog? Also, whether they are not throwing away the substance for the shadow who, parting with that legitimate charm of photography, and wherein it must excel any of the other graphic arts—*i.e.*, in definition and detail—are not falsifying their art and stultifying themselves in the unstopping of their lenses, or discarding them altogether for the blurred focus of a larger or smaller pinhole?

* A communication to the London and Provincial Photographic Association.

A New Material for Paper.—The South American papers report that a new factor is likely to enter the market of the paper manufacturers. It has been proved, they say, that the banana plant contains a greater quantity of pure fibre than any other of the numerous vegetable products used in this manufacture. During the first twelve months of its vegetation the banana plant only produces a single bunch of fruit, after which it dies; but from its roots four to ten young plants shoot up. The adaptation of the plant to commercial purposes will, we are told, revolutionise the market for paper material, and largely affect that industry. The banana plant is easy of cultivation; its fruit is already somewhat largely consumed in Europe, and is prized by some for its slightly laxative properties, and the wandering tribes of Central America have long made use of the banana in a variety of manners.—*Burgoyne's Monthly Magazine.*

Notes.

What is known in the trade as the "lamp season" has now commenced, and in various shop windows may be seen paraffin lamps of almost every shape and form which the wit of man can devise. Such lamps are frequently used in photographic work, so it may be advisable to point out that the great majority of them waste a considerable amount of the light emitted by the flame, in consequence of the employment of glass shades of unscientific design. Commonly enough, the shade is of somewhat the form of a tulip, with its orifice open to the ceiling; such shades let light pass freely, and reflect it freely, to the ceiling, where it is not required, but quench a heavy percentage of the rays which would otherwise reach the table on which the lamp stands. Gas globes which will absorb at least fifty per cent. of the light they receive are not at all uncommon. No part of a gas globe should so come between the flame and the table as to prevent the direct illumination of a considerable area of the latter; even the intervention of colourless unground glass will cut off a little of the light by two reflections. Metal cisterns and supports to paraffin lamps are better than those of glass or other fragile substances liable to accidental breakage. That class of paraffin lamp which has an air-passage up the centre, and gives a tulip-shaped flame, emits a large amount of light as compared with the quantity of paraffin consumed. A paraffin lamp is more safe when the cistern is full of oil than when it is partly full, and with good oil possessing the qualities demanded by law, there is little danger at any time; moreover, there are good "safety lamps" in the market. The main points demanding attention when purchasing a lamp are, firstly, that it shall be made of metal wherever possible; and secondly, that its shade shall permit the rays from the flame to come freely downwards rather than upwards. Much depends, in all cases, upon the quality of the wick.

A new application of light is in use in Illinois. In a large printing office wires from the counting boxes of the machines run to the superintendent's office in another part of the building, and there actuate electric lamps, so that by the flashing of the lamps as the sheets of paper are printed, it can be told whether the machines are going too fast or too slow, or whether they are at a standstill. In each counting box is a make-and-break commutator which sends the electrical pulsations.

Some photographers will not use bromide paper for positive printing because the proofs cannot be toned in the usual way. Dr. Miethe overcomes the difficulty by first transforming the image into chloride of silver by means of a bath composed of the following "parts":—Water, 1,000; alum, 20; bichromate of potash, 10; hydrochloric acid, 20. After a few minutes' immersion in this bath the proof is washed with care, then exposed to light for about two minutes, and then re-developed with the "citric acid developer," which we presume to be the ferrous citrate developer. This usually gives a print of good tone; if not, the print can finally be put in an ordinary toning bath.

Dr. A. Miethe has been trying experiments with films of mica coated with gelatino-bromide of silver, as made by a firm in Görlitz, which firm exhibited negatives upon them at the Congress of the Friends of Photography in Berlin. He says that mica is twenty-three times lighter than glass; that the coated mica plates show no tendency to bend when placed in the dark slides; that they sink in the developing solution, but move to and fro as they sink; that the films have somewhat a tendency to leave the plate, and that to lessen this danger an alum bath may be used. The finished negative is somewhat liable to damage at the edges, over which it is judicious to paste a binding of strong paper. They can be printed through from either side, and are little liable to damage from a fall.

We have all heard and read stories concerning the wonders achieved by itinerant jugglers in India, which quite eclipse the most successful tricks of European wizards and conjurors—feats which are not accompanied by elaborate apparatus, but are usually performed with the simplest articles, and as the juggler or fakir sits on any convenient spot in the open air and in the full light of day. One of the commonest tricks is to scatter a few seeds in a little loose earth, cover the whole with a cloth, and after a few seconds to remove that covering and display a mango or other tree in full growth and about two feet high. The cloth is laid aside, and presently something is seen moving beneath it. The fakir again lifts the covering, and a live baby is seen squirming about on the ground. Back goes the cloth, and the fakir slashes it through and through with a knife in such a way that the little creature beneath must infallibly be cut to pieces. But presently it is shown that no baby is there.

This performance was recently witnessed by two gentlemen who had previously resolved to test a theory which they had suggested to explain these marvels. One was an artist who, armed with pencil and sketch-book, made rapid pictorial notes of what he saw, and the other, a photographer, was prepared with a kodak to take instantaneous shots at the exhibition in detail. These gentlemen, Messrs. Lessing and Ellmore, have published their strange experiences in an American paper, and they give as the locality in which the exhibition occurred a place called Guya, which is a town south of Dinapur.

In addition to the tricks already named, the fakir who was the performer in the present instance accomplished another feat of a still more remarkable character. Holding the end of a ball of twine between his teeth, he cast the rest of it in the air, and it ascended in a straight line skyward, the little crowd which surrounded him watching it as it rose. When their

eyes again sought the fakir he was no longer alone, for a boy stood by his side. This boy, at a gesture from his master, rapidly ascended the twine, like Jack did the beanstalk, and presently with it disappeared in space. Each detail of this wonderful performance was sketched and photographed as it proceeded, and the two gentlemen afterwards compared notes. The sketch-book duly showed everything which the operators had seen; but in the photographs, although the image of the fakir was there, mango bush, baby, and boy were quite invisible.

The result of their experiment justifies, so the authors think, the theory that they had formulated, which is, that by some subtle means these fakirs have the power to hypnotise or mesmerise those who look upon their performances, and that the essential parts of the tricks exist only in the imaginations of the onlookers. But they have not yet learnt how to hypnotise a photographic camera, which refuses to reproduce anything which has no objective reality. This theory is a plausible one, but does not make the juggling less wonderful. The most marvellous part of the business is, that men possessing such powers should not rise above the position of mendicants who are eager enough to send round the hat after each exhibition. A man with the power of mesmerising an audience in this way could soon make his fortune in any European capital.

Photography seems likely to be the science which will add most to our at present very slight knowledge of other worlds. The latest photographs of the planet Mars, by Professor Pickering (which he publishes in the *Siderial Messenger*), are full of interest for unscientific people as well as for astronomers. These photographs were fourteen in number, seven being taken on the 9th of April, and seven on the following day. Care was taken to photograph the same face of the planet on each occasion, and on each of the proofs can be recognised quite distinctly the geographical configurations; but in those of the second day, the white polar spot which marks the south pole is much larger than in those of the first day. It has for some time been known that the stretch of these polar spots varies with the seasons of Mars; diminishing with the summer, and enlarging during the winter. But it is the first time that it has been possible to register the precise date of a considerable extension of these snows, as he and many others believe them to be.

"The visible stretch of these snows," writes Mr. Pickering, "is really immense, because they cover 2,500 square miles." On the morning of April 9th these polar snows were faintly marked, as if they had been veiled by a fog, or by small bodies separated, too faint to be individually reproduced; but on the 10th April the entire region was very brilliant, equalling in brilliancy the snow of the north pole. The date of this event corresponds with the end of the winter season of the hemisphere south of Mars.

On board the Atlantic steamers there is a perfect shoal of amateur photographers; in fact, the camera appears now to be an indispensable adjunct to every traveller's luggage. Some of the photographic mementos of a passage across the Atlantic are no doubt very amusing; but in more than one instance an attempt to take a photograph secretly of some particular scene resulted in some disagreeable consequences. The photographic "cad" is not a nice person to travel with, and it is to be feared there are too many of these gentlemen about. All the more need, therefore, we repeat, for a code of manners.

There is a good deal in Professor Herkomer's recent lecture on portraiture which photographers might study with advantage. The difficulties which photographers and portrait painters experience are the same, and Professor Herkomer touched upon the various points in a manner which every photographer will recognise as something approximate to his own experience. The difficulty of pleasing the sitter, and at the same time doing justice to one's self, is at times insurmountable. Professor Herkomer's portrait of the late master of Trinity College, Cambridge, he regarded as one of his best, but the sitter was dissatisfied with the result. He tried to paint Wagner, and as the latter would not sit, he at last in despair roughly and rapidly painted from memory a portrait of the great musician. When Wagner saw it, he was so pleased that he consented to sit, and at once put on that expressionless, characterless look which so worries photographers. Professor Herkomer has found it a good plan to allow the sitter's family to watch the picture in progress; for the sudden confronting of a man's relations with the finished portrait, generally in a light in which they had never seen the subject, was often disastrous.

Here, again, the experience of the photographer comes in, for he can only give one expression, while the sitter's friends and relatives are familiar with a hundred, and not only with a hundred, but with some out of these hundred mingled together, the combination of which makes up their general idea of a particular face. But Professor Herkomer scarcely does photographers justice when, in speaking of the necessity for an artist to be *en rapport* with his sitters, he says: "If he did not sympathise with his subject he became a mere photographer, who pressed people into set positions." This may be true as regards certain commercial work, but the condition of sympathy is one which the artist-photographer of the first rank invariably tries to establish. As for pressing people into set positions, he would never attempt anything of the kind. Professor Herkomer's words might have been of general application thirty years ago, but they are no longer so.

THE PROPOSED PHOTOGRAPHIC INSTITUTE.*

A TALK WITH SIR H. TRUEMAN WOOD.

PHOTOGRAPHY within the last few years has forged ahead with remarkable rapidity. Clumsily handled, and ill-understood by the men who first essayed to employ it, it has been reduced in these later days to the level of a science, and exalted to the dignity of a fine art. New process has followed new process, as wave follows wave, until the photographic artist has become a veritable Alexander, protesting that the fields of discovery are all but exhausted. There are, in all likelihood, a few surprises still in store for him, but there will be more, say the friends of the science, if photography has but its chartered institute. It has its learned societies, with their love of technical lectures; its amateur associations, preferring an ounce of their own practice to a pound of anybody else's theory; its conventions, its congresses, and its exhibitions. Yet it is not content. It is argued that this widely-distributed and varying force must be focussed, or it will be largely wasted, and that an institute in London is the thing that will focus it. Sir Henry Wood, who courteously gave one of our representatives some information as to the project, is, it will be observed, not altogether sanguine about the matter; but the idea is obviously one that, once planted in the photographic mind, will, in all likelihood, take root vigorously.

THE PROMOTERS.

"So photography, like every other science, is presently to have its Institute?"

"Yes," said Sir Henry Wood, "that is what we are aiming at. As yet, however, we are only on the threshold. The idea was first brought forward by Dr. Lindsay Johnson. He pointed out to the Council of the Photographic Society that Berlin and Vienna have Photographic Institutes, and urged that something of the same kind was very desirable in this country. The Council was impressed with the suggestion, and formed a small committee, consisting of Mr. Glaisher, the president, Mr. Bird, the treasurer, Captain Abney, Mr. Kenrick Murray, Dr. Lindsay Johnson, Mr. Gale, and myself, to formulate a scheme. In the meantime, Dr. Lindsay Johnson had secured the good offices of the Lord Mayor, who has kindly promised to convene a public meeting at the Mansion House when the proposal has assumed definite shape. We may, I think, say that we have now reached that point."

WHAT THE INSTITUTE COULD DO.

"Will you give me an idea of what the scheme is?"

"I think I may do so, even at the risk of being considered somewhat premature. We had naturally to look at the question from various standpoints. First of all, as regards the science of photography. It appeared to us that a photographic institute could very properly encourage the discovery of new processes and the farther development of the existing uses of photography. It might either undertake researches through its own staff, or provide suitable laboratory accommodation for its members, and encourage the successful by grants of money. It would, in any event, make provision for the careful testing of photographic apparatus and materials. From an artistic point of view, it would probably arrange for the holding of exhibitions, both national and international, and would aim possibly as high as the convention, now and again, of an International Congress. As to the commercial aspect of photography, it would provide assistance and information on a great many points, and in matters of copyright and patent should be especially able to safeguard the interests of those engaged in various branches of the photographic industry."

A CENTRE OF PHOTOGRAPHIC EDUCATION.

"But the educational influence of such an institute would alone give it a good claim to support?"

"Yes. One of the chief aims would be to furnish the student with the opportunity of perfecting himself in every branch of photographic knowledge. Lectures would be arranged, classes established, and a regular course of instruction in the technical details of photography would be provided. The institute would hold examinations, and grant diplomas to those who attained the requisite standard of efficiency. Such certificates would not be without their value to young men seeking employment in the many branches of photography. Travelling and other scholarships might be founded if sufficient funds were forthcoming. The institute would naturally aim at establishing a first-class photographic library, and a museum which should be at once historical and scientific."

A BOLD SCHEME.

"You would, of course, seek a charter of incorporation?"

"Yes, and probably it would not be refused us. The difficulty does not lie in that direction so much as in the matter of funds. To carry on the work of a really comprehensive institute would require extensive premises, fitted up for the particular purpose in view. There must be an exhibition gallery, a conference or lecture room, a library, a museum, class rooms, laboratory, studios, dark rooms, and printing rooms. There must be rooms fitted up for the carrying out of collotype, Woodburytype, and various photo-typographical processes. Such building, with the requisite offices, would, it is calculated, involve a capital expenditure of some £10,000 to £12,000, and the scheme itself would cost, roughly, from £4,500 to £5,000 a year. Against this, you would have to set the subscriptions of members and affiliated societies, fees from students, charges for experimental work, and donations and bequests. You will see that the project is one which cannot be developed in a day."

IS IT NECESSARY?

"The point that suggests itself to me is, whether many of the ends you have in view could not be obtained by means of the existing photographic associations?"

"Well, as regards the Photographic Society, its principal work is to hold an annual exhibition. That work it does extremely well. In fact, it would be difficult to do it much better. It is true, it has meetings once a month during the winter season, when papers are read and discussion takes place with reference to various matters connected with photography; but that part of its work has not, I think, been done so well as it ought to have been done. In this respect the Photographic Society does not take the same position in relation to photography as the Chemical or the Physical Society do in respect of their particular branches of work. Of course, to a certain extent, much of the educational work proposed by the institute is already done. At King's College, for example, they have for a long time had a photographic department, in which instruction is given by Professor Thompson. In the Finsbury Technical Schools similar instruction is given by Professor Meldola. Probably this educational work is as good as the proposed institute could arrange for; but for all that, it would be eminently desirable that it should be extended in the way suggested."

PROFESSIONAL JEALOUSY.

"You presume that the professional and the amateur photographer could dwell together in unity?"

"I see no reason," said Sir Henry Wood, "why they should not. They work together very harmoniously in the existing institutions. Take the Photographic Society as an instance. It was formed twenty-five or thirty years ago, in what I may call the early days of photography. All the principal photographers have been and still remain members of the Society, though, as amateur photography has developed, amateurs have joined our ranks. For the amateur the old photographic societies are a little bit too high and dry. They deal with questions, perhaps, from a too exclusively scientific standpoint, with the result that there is little to interest the general amateur. He wants something a little more popular. I do not think there is really much antagonism between the amateur and the professional element. It is true there are a few of the smaller photographers who look upon the amateur with a jealous eye. They may possibly have suffered through him, but not to any extent, because there are few amateurs who can take a decent portrait. If you want a good photograph, you must go to a man who has the knowledge, the experience, and the requisite facilities. You cannot put a man up against your garden wall and take a good picture of him unless you are very clever. But put him in a properly lighted studio, and almost anybody can produce a more or less decent photograph."

* From *The Oracle*.

THE AMATEUR OF TO-DAY.

"Is it a fact that the greater part of the improvements in photography must be credited to amateurs?"

"Yes, I think that is true, but it was more true a few years ago than it is now. The average amateur now takes up photography as an amusement, whereas the old amateur was a scientific man, who was more interested in the science of photography than in picture-making. You may say, however, that almost every improvement has come from the amateur, from the days of Daguerre until a very recent period. Too many professional photographers are content to this day to go on with the art as they find it, without themselves seeking to advance it. My own impression is, that the proposed Institute would find its principal work in regulating the photographic industry, and that the amateurs would form only a small, though by no means an unimportant, portion of it."

ONE STEP AT A TIME.

"You are not absolutely sanguine as to the immediate success of your scheme?"

"I am not, personally. It is rather a large proposal, but the committee thought it their duty to take a comprehensive view of the matter. If the scheme can be carried out in its entirety, we think it will be greatly for the advancement of photography. On the other hand, we may have to be content with a small beginning, and, starting from a modest basis, leave the institute to branch out in the directions which experience suggests. With the great interest now manifested in photography, and the considerable number of photographic societies there are in existence, there ought to be no difficulty in getting funds, at all events for a reasonable scheme. With every year the chance of perfecting the institute would increase. We could scarcely expect to burst full-blown upon the world. We have submitted what we think is the best scheme, and we shall try and work up to it as far as circumstances allow."

PRIMULINE PRINTING PROCESSES.

Recognising the importance of processes arising from the photographic sensitiveness of the primuline derivatives, the *Photographisches Wochenblatt*, in the last two numbers, gives a summary account both of the method of Messrs. Green, Cross, and Bevan, which recently attracted so much attention here, and that of Herr Feer, in which the developing agent is present along with the sensitive compound, so that, as we understand, no proceeding subsequent to exposure is required, except simple washing to remove the unacted-on salts and fix the image. It is also to be remarked that in Feer's process the printing is direct from the negative instead of from a positive, and the ground is free from the yellowish tint which at present, according to the Green, Cross, and Bevan process, remains in the paper or fabric when the operations are finished.

Dr. Otto Von Witt, in *The Wochenblatt*, from which we extract the following account, points out, amongst other matters, that the sensitive sulphonic compound of diazo primuline that is exposed to light in the direct process is not liable to explode. He says:—

When contemplating the general position of photography at the present time, we find a general concensus of opinion with regard to the method and application of the negative processes, a proof that they are in a state giving general satisfaction, but it is otherwise with the positive process. In this department we find methods of the most various kinds wax in favour, only to wane and disappear. We see the same photographer take up now one and now another process, without finding sufficient reason to continue its use. This fact is a proof that each of the processes hitherto practised has certain defects either in the complication of the proceedings, or the defective character of the results. The following account does not profess to describe a new process of universal application; it deals rather with two processes yet in their infancy, but which, nevertheless, promise to be of general interest, because they point to completely new paths.

If we consider the numerous methods of positive printing hitherto known, we find one universal characteristic in all of them; the basis support, in conjunction with starch, gelatine, albumen, gum, &c., is in every case an organic body—in fact, a carbon compound; whilst the image is in every case of an inorganic nature, for it consists of finely divided metals, metallic compounds, or, in the pigment process, of finely ground carbon and other pigments.

In the case of the new processes which are about to be described, organic compounds are chosen for forming the image, and, indeed, bodies belonging to the aromatic series, a series which has been known and celebrated as yielding coloured products in abundant variety. Generally speaking, all organic colouring materials, both natural and artificial, belong to this series. Synthetical chemistry gives us an abundance of reactions by which coloured substances can be formed from others which do not themselves possess tinctorial qualities. In fact, both the positive processes about to be described involve reactions of this kind, with the additional provision that they are brought about and completed by the action of light. This consummation by the influence of the luminous rays is common to both processes; common to them, also, is the circumstance that the colouring bodies produced belong to the same class, namely, the azo-colours. However, in the method and fashion in which the two proceedings arrive at their end, they differ diametrically.

In the case of Feer's process, which, indeed, is the older of the two, light acts on a colourless material, with the result that a coloured body is formed; the proceeding is therefore analogous to most other printing processes, such as the silver, platinum, and the cyanotype process. It produces a positive print from a negative, or from a diapositive it produces a negative.

The primuline process, discovered by Green, Cross, and Bevan, depends upon the presence of a body which can be changed into a coloured substance by a very simple proceeding, but by the action of light it loses this capability of being so changed. The consequence is, that only those parts which are protected from the action of light take on colour. In other words, this method gives a copy of the same character as the original—a negative from a negative, a positive from a positive.

Each proceeding has its own characteristic merit, but their difference indicates separate uses and applications. We will now proceed to give particulars of each process in greater detail, and we will commence with the simpler of the two primuline processes.

All those who have a special study of organic chemistry are aware of the fact that there is a numerous class of bodies called primary amines, and that these, as far as they belong to the aromatic series, are very readily acted upon by nitrous acid, and converted into the corresponding diazo derivatives. These diazo bodies all decompose readily; indeed, in the dry state they are actually explosive, and therefore they ought never to be preserved in such a condition, but as they are required for use they should be prepared by treating the corresponding primary amines with nitrous acid in aqueous solution. If we bring such freshly prepared aqueous solution of a diazo-compound into contact with another amine, or with cer-

tain bodies belonging to the class of phenols, there is an immediate formation of an abundant coloured precipitate —one of the so-called azo colours—amongst which we find yellow and orange in various shades extending towards red, up to scarlet and carmine. The list of tints also includes violet and, indeed, blue.

Almost all diazo bodies decompose gradually under the influence of light, and thereby lose the property of forming azo-colours by uniting with amines and phenols. The merit of Messrs. Green, Cross, and Bevan consists in having found a diazo body which is so quickly decomposed by light as to allow a photographic process to be based upon this circumstance. The photographic application is much facilitated by certain characteristics of the diazo derivative of primuline towards primary amines, and from primuline, therefore, the process takes its name.

Primuline is the sulphonic acid of a previously known yellow primary amine, dehydro-thio-paratoluidine, and it was discovered by Green about two years ago. He also noticed its remarkable peculiarity of being absorbed from its aqueous solution by cellulose and other fibres. If cotton or paper be immersed in an aqueous solution of primuline it is quickly dyed yellow, and the primuline fixed in this way upon the fibre can, like other primary amines, be diazotised. When paper or cloth dyed with primuline is immersed in a solution of nitrite of soda acidified with acetic acid, the colour is changed, and we have upon the paper or cloth the diazotised primuline. The material may now be dried without change, and if it be immersed in a solution of an amine or a phenol, an azo-colour is formed, this remaining thoroughly incorporated in the fibrous material. Diazotised paper or cloth of this kind can be coloured yellow by immersion in a solution of carbolic acid, orange in a solution of resorcin, brown in a solution of phenylendiamine, carmine red by a solution of beta-naphthol, and deep violet by a solution of alpha-naphthylamine.

The diazotised materials are in the highest degree sensitive to light; when they are acted on by light they give off nitrogen, and lose the capability of becoming coloured in the above solutions.

From the above facts the primuline photographic process naturally arises. The diazotised and dry primuline paper or cloth is exposed under a positive, if a positive image is required, for about two minutes in sunlight, or half-an-hour in diffused daylight. It is then immersed in one of the above mentioned solutions, when the image immediately appears.

The whole process is remarkably simple. Its principal application is likely to be as a copying process for plans and drawings. The disadvantage that the prints have no pure whites, but that the ground remains of a yellowish colour, is of secondary importance, and is abundantly counterbalanced by the possibility of obtaining prints of various colours by painting the requisite developing solutions on different parts of the print. Another advantage is the possibility of preparing plans and drawings on cotton fabric which can be readily washed when soiled. Moreover, the primuline process ought to open up a new industry in the production of pretty coloured decorations on textile fabrics.

We hear that the inventors propose to bring coloured fabrics and papers into the market, and that the process is patented in all countries. The purchase of the paper or cloth from the inventors will, therefore, become the license for the use of the quantity so obtained.

Feer's patented process depends upon quite another principle. All diazo compounds will unite with sodium sulphite to form the so-called diazo-sulphonic salts, bodies that crystallise easily, and in which the peculiarities of the diazo-compounds are completely masked. They are very permanent, not liable to explode, and do not react with amines and phenols to form coloured bodies. When the above mentioned sulphonic compound is mixed with amines and phenols in solution, colourless liquids are obtained which can be spread upon paper, and this paper can be dried without change in the dark. When, however, it is exposed to the light, the diazo-sulphonic salt is decomposed, and the free diazo body is again formed, and reacts instantly with the phenol or amine present, and intense azo-colours are thus visibly produced under the action of light. In this case we use a negative when we wish to produce a positive print.

According to Feer's process, any azo-colour can be thus formed by the action of light; hence we are in a position to produce any required tint. Particularly striking are the scarlet-red images which are obtained when the diazo-sulphonic salts of pseudo-cumidine is mixed with beta-naphthol in a solution made alkaline with caustic soda. The paper coated with this solution is dried and exposed. If, instead of taking beta-naphthol, we employ alpha-naphthylamine, violet prints are obtained, and with resorcin the prints are orange in colour. Prints by Feer's process show brilliantly white lights, but the image sinks rather deeply into the paper, and is consequently flat, a disadvantage which should be easily remedied. The future of Feer's process rests in the preparation of copies of any required colour from negatives.

As to the practical value of these two processes, the future must decide. In any case, they strike out entirely new paths, and merit the profoundest consideration.

JAPANESE PHOTOGRAPHS IN GOLD.

PROFESSOR W. K. BURTON closes an article in *The Photographic Times*, of New York, about Japanese photographic work in an exhibition, thus :—

I have reserved for the last notice of what is an exhibit perhaps the most interesting of any, because it is quite new. The exhibitor is A. H. Mizuno, of Yokohama, and what is shown is a series of photographs in *gold* on dark coloured lacquer. The intention is to produce, photographically, the equivalent of hand-done pictorial work in gold in lacquer—one of the fine arts in which Japan far excels any other country in the world. The effect, considered decoratively, is very pleasing. The process has, as yet, been kept secret. One thing the exhibition shows is the much higher level that photography has reached in the metropolis (Tokio) than in any other part of the country.

I predict that, in ten years or less, Japan will be able to produce an exhibition of photographs that will compare favourably with any that can be shown in any other country. They have all the necessary qualifications in the keenest intuitive artistic taste and in a wonderful degree of manipulative skill. The great drawback at the present time is the comparative difficulty in gaining technical knowledge.

A good deal of apparatus is shown, chiefly cameras. Seeing that the Japanese have only taken at all extensively to camera making within the last couple of years, the work shown is very creditable. In fact, the skill of the Japanese in all kinds of wood-work is so great, that I cannot doubt they will soon come to excel in camera work if they stick to it; that is to say, at least, so far as construction goes. So far they have only copied cameras of English design.

Patent Intelligence.

Applications for Letters Patent.

17,636. G. L. SUMMERFIELD, 52, Outram Street, Darlington, "Adjustable Extension Camera."—November 4th.

17,643. J. R. MALLY, 18, Fulham Place, London, "Photographic Frames."—November 4th.

17,694. E. W. FOXLEE, 22, Goldsmith Road, Acton, London, "Priuting with Primuline."—November 4th.

17,708. D. T. NOPS, 18, Buckingham Street, Strand, London, "Accelerating the Manufacture of Process Blocks."—November 4th.

17,821. M. E. BANGOR, 98, Salisbury Road, High Barnet, "Automatic Continuous Magnesium Light."—November 6th.

17,900. J. W. T. CADETT, 33, Southampton Buildings, London, "Apparatus for Cutting Glass."—November 7th.

17,926. H. Y. DICKINSON, 56, Gray's Inn Road, London, "An Optical Illusory Book."—November 7th.

17,936. L. HELLIWELL, 35, Southampton Buildings, London. "Supporting Negatives during Development."—November 7th.

17,990. J. L. E. DANIEL, 68, Fleet Street, London, "Photographic Shutters."—November 8th.

18,029. W. H. SMITH, 15, Southampton Buildings, London, "Photographic Printing Frame."—November 8th.

Specifications Published.

17,318. *November 1st*, 1889.—"Photographic Cameras." FRANK MIALL, 13, Shelgate Road, Battersea Rise, Surrey, Manufacturer of Photographic Apparatus.

The mode of using the camera is:—After the plates, by the withdrawal of the several lids, are transferred bodily and in a mass from the store box which is temporarily fixed to the discharging box in a horizontal position to the axis of the lens, they are then conveyed by the action of the transversing carriage to the vertical position, and placed in the front of the receiving box, which retains them ready for exposure; and such action to be repeated plate after plate until all be transferred from the discharging box into the receiving box, and can then be removed from thence into the store box.

The inventor claims:—

1. In photographic cameras, the use of a store box to convey sensitive plates or films into the camera, and to receive them after exposure, these several operations to be performed in the open air and without the aid of a dark room.

2. In photographic cameras, the removal or reversal of a sensitive plate or film from the horizontal into the vertical position, by means of projections or pivots, which are formed on the carriers containing the sensitive plates or films.

3. In photographic cameras, the use of a hinged or pivoted bottom to a receptacle containing sensitive plates or films, whereby a plate or film can be removed from beneath a number of others.

4. In photographic cameras, the use of a traversing carriage actuating a hinged or pivoted bottom of a plate receptacle.

5. In photographic cameras, the use of a carrier to contain sensitive plates or films, having formed on its sides or ends studs, projections, or pivots.

19,975. *December 12th*, 1889.—"Lime-light Jets." ALFRED SUITER, 2, Como Road, Forest Hill, Kent, Mechanical Engineer.

Lime-lights, as ordinarily constructed, require a separate jet—or, at any rate, separate nozzles or burners—for each kind of light, such as "blow-through," "mixed," and "ethoxo;" although different nozzles or burners are sometimes used on the same jet, they constitute loose parts, and are apt to be lost or mislaid.

In the lime adjusting portion of the apparatus the revolving motion is much too fast, and when the central screw is of sufficiently sharp pitch, it runs itself down by the least touch or joggle; and when a worm-wheel working on a central screw and worm are used, although it gives the proper speeds, it, at the same time, is complicated and costly.

The object of this invention is to combine the different kinds of jets in one, so that the same jet can be used for either a "blow-through," "mixed," or "ethoxo" light or others, and that there shall be no loose parts; also to give a proper adjustment of the lime by a more simple and effective mechanism than has been employed heretofore.

In carrying out my invention, I introduce between the nozzle or burner of the jet a four-way valve, piston, screw-down, or other valve, communicating on the one side with the separate gases, and on the other with the openings in the nozzle or burner; the passages in the four-way or other valve are so arranged that, when the four-way or other valve stands in one position, there are clear ways through for the separate gases to pass to their respective openings in the nozzle or burner, thus forming a "blow-through" light, and upon a movement of the four-way or other valve, one gas is diverted from one opening in the nozzle or burner into the other passage containing the other gas, thus forming "mixed" and "ethoxo" lights.

To regulate the size of the opening in the nozzle or burner, as required by different lights, the four-way or other valve can be formed in the burner itself, and so arranged that the action of adjusting it, for either kind of light, has the effect—by suitable screw or other motion—of withdrawing from or introducing into the opening in the nozzle or burner a tube or liner, or loosely fitting plug, so either enlarging or diminishing the area of the opening.

For adjusting the lime I mount the pillar for supporting the lime upon a suitable bracket or central pin, the pillar being free to turn on its axis and move vertically; upon this pillar is cut a spiral groove provided with teeth or cogs; into these a worm engages, which is fitted on the spindle that extends to the back end of jet. Upon turning the worm, the lime pillar receives a rotary and a vertical motion at the same time, owing to the worm being capable of a rotary motion only; the amount of rise and fall of lime pillar (per revolution) being dependent upon the pitch of the aforesaid toothed spiral groove.

Correspondence.

LONG-FOCUS LENSES FOR PORTRAITURE.

SIR,—In Mr. Debenham's paper, printed in your last, he says (page 863), "I have heard the question put thus: 'If I take a full-length figure on a quarter-plate with, say, a 7-inch focus lens, I can get the accessories and background defined to an extent that is sufficient. Why, then, if I use a lens of double the length of focus, and a stop of the same proportion or rapidity, can I not get the same amount of general focus as in the former case?'" He explains that "to get this equal amount of definition, the law referred to (that the definition of out-of-focus planes is dependent on the absolute size of the diaphragm, independent of the focal length) shows us that a diaphragm of equal diameter—not proportionate to the focal lengths—is required, involving an exposure four times as long as in the other case."

Waiving the question whether Mr. Debenham's generalisation is entitled to be called "a law," it is important to notice that a serious practical error might be supposed to follow from it, namely, that a short focus lens gives more "depth" than a long focus one for a portrait *on a given scale*. I fear that as it is, operators are but too ready to use short-focus lenses, and to place themselves at short distances from the sitter, with the injurious results as to perspective and "drawing" so severely stigmatised long ago by Mr. Hamerton.

Now, as it is a fact that if, in using a long-focus lens instead of a short one, we do not attempt a larger scale, but simply increase our distance from the sitter in proportion to the longer focus of our lens, the long-focus lens will allow of just as great intensity, and give at the same time just as great "depth," as one of shorter focus. Would it not be far better to say at once that depth of focus depends simply on the scale of the picture and the intensity of the lens, irrespective of its focal length? Then we make no mistake, and use a correct generalisation.

To test the accuracy of this rule by an example, I have cal-

culated the conjugate foci for nose and ear respectively for two lenses; the one of 9 inches, the other of 18 inches focus. I have supposed the 9-inch lens to be placed at a mean distance of 72 inches; reckoning the nose at 70 inches, and the ear at 74 inches. In like manner the 18-inch lens has a mean distance of 144 inches; reckoning the nose at 142 inches, and the ear at 146 inches. Thus, the scale of both images is the same. The results are as follows:—

	Conj. Focus of Nose.	Conj. Focus of Ear.	Difference.
9-inch lens... ...	$10\frac{20}{61}$	$10\frac{16}{25}$	$\frac{324}{3965}$
18-inch lens... ...	$20\frac{19}{31}$	$20\frac{17}{32}$	$\frac{324}{3968}$

I have brought the fractions of an inch representing the difference of foci to the same numerator, so as to show more clearly how minute is the difference between the two lenses. But that the 4 inches between nose and ear bear a larger ratio to the nearer distance of the 9-inch lens than to the more distant one of 18 inches focus, the result would be absolutely the same. The difference is far less than a hair's breadth; but, such as it is, is in favour of the longer focus lens.

Thus, the difference of conjugate foci being the same, the intensity may also be the same; and we may acquire, with a longer focus lens, not only the unmixed advantage of greater covering power, but also the far more important one of better perspective and "drawing." It is, in fact, the *right use* of lenses referred to in the Presidential Address to the Conference.

I would not wish, however, for it be supposed that in making this practical correction of Mr. Debenham's somewhat hasty generalisation, I am finding fault with his main contention as against so-called "naturalism." The limits of a letter, or, indeed, of a single article, are quite insufficient to show what I believe to be the radical misconceptions of physiological and psychical processes in natural vision which pervades Dr. Emerson's impressionist theory. And it is but fair to remark that, although the conditions of ordinary natural vision differ so much from those of the vision of a photograph imaged by a lens as to render their comparison difficult and sometimes misleading, such comparison appears to be, in Mr. Debenham's argument, a just and reasonable meeting of Dr. Emerson on his own ground. As regards the necessity for using very small stops to obtain really good definition all over a large plate, I may, perhaps, venture also to add, that what is probably an unusual experience in very large plates, as well as theory, has shown me that the advantage, and indeed the necessity, for using very small stops, wherever practicable, in photographing on a large scale, is in no way over-rated in the paper referred to. Indeed, it is rather under-rated than otherwise.

106, *High Street, Oxford.* W. H. WHEELER.

SPECIAL RAILWAY FARES FOR PHOTOGRAPHERS.

SIR,—At a meeting of the Council of the West London Photographic Society, held on Friday last, a discussion arose as to the desirability of getting special rates for photographers, from the railway companies, travelling for the purposes of the art, and I was directed, as president of the above Society, to write to you with a view of ventilating the subject.

It has been a practice for some time past for railway companies to grant special cheap tickets to *bonâ fide* anglers. To obtain this privilege, all that is necessary is that the applicant for such a ticket should be a duly credited member of an angling club, and have a pass or certificate to that effect issued by a central angling society. Anglers must carry a rod and the usual implements of the craft, and actually be on fishing bent. Anglers may go in bodies or singly, just as they please, and previous notice to the railway company is not necessary. I do not know the number of established angling clubs, or the number of their members, but they are very numerous, and the cheap ticket is extensively patronised.

I venture to think that photographers are an ever-increasing body, and as much entitled to the benefit of a cheap railway ticket as the angler. The anglers travel entirely for their own pleasure, while the photographers bring home pictures that afford pleasure to others besides themselves, and by their publicity advertise the line of railway on which they are taken. I believe cheap tickets are granted to photographers by some railways, but the privilege is considerably discounted by the fact that the travellers must go in bodies of not less than eight or ten, I believe, and must give, some days prior, notice of their intentions. What I would suggest is, that all the leading photographic societies should combine in a representation to the railway companies on this matter. The West London Photographic Society would cordially co-operate with older societies who would take the matter up, or would, if supported and desired, approach the railway companies themselves in the common interests of their brother photographers.

Any information on the matter would be gratefully accepted by myself or by our indefatigable hon. sec., Mr. John Hodges, 87, Chancery Lane. WALTER ADAM BROWN,

President of the West London Photographic Society.

PASTELS AND PHOTOGRAPHY.

SIR,—I observe in the last number of the NEWS, in an article on "Pastels and Photography," the following sentence: "We see no reason why, in the near future, a new branch of art should not arise in which coloured chalks or pastels should be employed for working upon a photographic base."

I should not have thought it necessary to notice this had it not been for the assumption that it would be a "new" thing for enlargements to be finished in coloured pastels. As I have used pastels for finishing enlarged photographs in colours more than twenty years back, I may be excused for objecting to the idea that it would be a "new" style of work for this purpose. I have also a distinct recollection that the late Mr. Faulkner exhibited a very boldly finished bust of a lady in coloured pastels at one of the early exhibitions of the Photographic Society, held, I think, in the Suffolk Street Galleries.

There is no more pleasing method of executing enlargements in colours, but it requires, in my opinion, more skill than other methods, if successfully carried out. Your own remarks on the Pastel Exhibition show that it is not everyone who may profess artistic skill that is successful. Why this method of finish has not been more patronised may be difficult to say for certain. I think one cause has been the uncertainty as to the permanence of the base on which time and money would have to be expended, and the necessity of employing more skilful aid than is commonly given to the finishing of photographs.

November, 1890. AN ARTIST.

THE GEOLOGICAL PHOTOGRAPHS COMMITTEE.

SIR,—I am desired to invite your valuable aid and co-operation in furthering the work of this Committee, which has been appointed to arrange for the collection, preservation, and systematic registration of photographs of geological interest in the United Kingdom.

At the meeting of the British Association held in Leeds in September last, the Committee were enabled to exhibit, as the result of their first year's operations, a collection numbering upwards of 270 photographs, many of which illustrated geological sections and other features of considerable scientific interest. A catalogue of these views will appear in the report of the Leeds meeting.

So far as the work has yet proceeded, however, only a small proportion of the counties in the British Islands have been represented, and the Committee would respectfully urge upon geologists the desirability of further assisting the scheme, with the object of forming, eventually, a national collection of photographs, illustrating the geology of our own country, which will ultimately be deposited in a centre where the collection will be available for purposes of study and comparison.

I shall be glad to receive copies of suitable photographs, which will be duly numbered and registered, or to be favoured with the following information, viz.:—

1. Lists and details of photographs of geological character already in existence.

2. Names of local societies, or persons, who may be willing to further the objects of the Committee in their own district.

3. Particulars of localities, sections, boulders, or other features which it may be desirable to have photographed.

In order to secure uniformity of action, and as a guide to those who are willing to assist in the scheme, a circular of instructions has been drawn up, copies of which will be supplied on application.

Osmund W. Jeffs, *Secretary to the Committee.*
12, *Queen's Road, Rock Ferry, Cheshire.*

DISSOLVING VIEWS IN CHURCH SERVICES.

Sir,—It is indeed true that one-half the world does not know what the other half is doing. You note in your last issue a dissolving view service, as if it were a new departure and a startling novelty. Why, sir, I should say that hundreds, if not thousands, of such services have been held during the last few years, though generally in mission chapels, &c. More than a year ago, I took part in one such, when the clergy were habited in the usual surplice, and when the ordinary evening service was used; but the hymns were thrown on the sheet, and the text of the discourse consisted of pictures of incidents in the life of our Lord. So numerous and popular are these services that, with the intention of holding one last Good Friday, I sent to the optician several weeks before to hire slides, but I found I was already too late, as every suitable slide had already been booked for many weeks. All this is worthy of record in the Photographic News, because it is, of course, only by photography that it has become possible to have these really beautiful and impressive sacred pictures. The caricatures of sacred things presented by the old hand-drawn slides would have inevitably dissipated every feeling of reverence and devotion if the thing had been attempted in the old days; whereas the solemnising effect produced by some of the latest pictures is very striking, and paves the way for the exhortations of the preacher. Henry Geary.

St. Thomas' Vicarage, 16, Somerset Street, Portman Square, London, Nov. 8th.

Proceedings of Societies.

The Photographic Society of Great Britain.

At the meeting of this Society held on Tuesday evening last, the 11th inst., the chair was occupied by the president, Mr. James Glaisher, F.R.S.

Captain W. de W. Abney read two letters from Colonel Waterhouse relating to some experiments on the reversal of the photographic image by the use of carbamide in connection with the eikonogen developer. These were accompanied by prints illustrating the method, which will be laid before the next technical meeting of the Society. The colours obtainable were reddish brown and purple, and, with the addition of ammonia, a yellowish tinge. He had found a great advantage from the use of a 5 per cent. solution of nitric acid, or of a 3 or 4 per cent. solution of bichromate of potash used as a preliminary treatment before development. Great clearness resulted from this mode of working. Still greater clearness, such as required for line work, can be obtained by treating the plate before development with bromide of copper. A small trace of bichromate in the development also worked well. As for exposure, he found he could scarcely give short time enough.

The medals awarded at the recent Exhibition were then presented, and votes of thanks having been passed to the judges and hanging committee, a paper on "Density Ratios as Affected by Development" was read by Mr. H. Chapman Jones. The paper was principally in reply to the statement by Messrs. Hurter and Driffield, that "the photographer has no control over the gradations of the negative, the ratios of the amount of silver deposited on the film being solely dependent upon the exposure." Mr. Chapman Jones's contention was to the effect that considerable variations in the proportions of the density of the different grades in the negative can be brought about by variations in development, and this he illustrated by experimental plates, and enforced by a series of tabulated results shown upon the black-board. He added that he did not seek to detract from the value of Messrs. Hurter and Driffield's experiments, but that he had endeavoured to show that, in one or two specific cases, their assertions were in error. At the same time, he expressed his thanks to them for the trouble they had taken in making so many estimations of density for him.

A written reply by Messrs. Hurter and Driffield to the paper just read, an advance slip of which had been forwarded to them some time previously, was also put before the meeting.

Mr. W. E. Debenham said that the power to regulate the character of the negative by variation of development was accepted almost as an elementary proposition by photographers generally. It did occur, however, in photography that propositions might be accepted largely without sufficient basis, and it was well, therefore, that they should come up for examination, that their soundness might be put to the test. Captain Abney had long since defined the principal weakness of photography as absence of true gradation at the two ends of the scale. It was of great importance to know whether anything could be done, and he believed that a great deal could be effected towards reducing this evil by particular methods of development. That Messrs. Hurter and Driffield's view of the powerlessness of the photographer to effect any variation in the density ratio after exposure was mistaken was, he thought, evident from the power which photographers certainly had reason to believe they possessed, of preventing the reversal of image in a plate which, with normal development, would have given reversal from over-exposure. Then, at the other end of the scale, he thought it could not be denied that a very different image was obtained from a plate when the development was stopped early, before the details of the shadows were visible in the dark room, and density was obtained by treatment subsequent to fixing, from the image produced by developing until the details in the shadows were brought out to the fullest extent.

Captain Abney said that Mr. Chapman Jones had proved in his paper the points that he, Captain Abney, had maintained. He thought that the results obtained by Messrs. Hurter and Driffield, and which differed from his own, were due to the use of logarithmetic calculations. Almost anything might be cloaked under logarithms. If they had used other logarithms, the results would have come out differently. An error of one place in logarithms makes a very great difference in the actual number. Mr. Debenham had shown that the fact of reversal of image being remediable within certain limits proved the capability of affecting the gradation by development. Some of his own work in photographing mountain scenery had required special development in order to produce gradation. In Switzerland, if you do not over-expose for the lights, you do not get a picture. You have to expose for the details in the shadows, and control the lights by judicious development. If there was no control over the gradation of density, the photographic world had been lying under a delusion for over forty years.

Mr. Valentine Blanchard stated that we had all had experience of the power of development to control gradation. Some time since, he had had some plates that had been exposed by a distinguished artist, brought to him for development. If treated in the ordinary way, they were hopelessly over-exposed, but after the first plate had shown this, the rest were saved by treatment with bromide, and development with a very small quantity of ammonia.

Mr. Chapman Jones said that Messrs. Hurter and Driffield, in the reply which had been read, did not appear to attempt to meet any of the arguments that he had brought forward. He failed to see that the fact that his investigation had been experimental rather than mathematical had anything to do with the truth or falsity of the statement that development cannot influence density ratios.

The Camera Club.

On Thursday, November 6th, Mr. Gale read a paper entitled "Country Rambles with a Camera." Mr. Frank Howard occupied the chair.

Mr. Gale commenced his address with notes concerning

some of his favourite counties, and then proceeded to urge the necessity for observation on the part of the photographer. The heads of his subject were: cottages in landscape, their styles, and the material used in their construction; river scenery; country ponds, commons, ploughing, and harvesting. The questions of figures in landscape and lightiug were also discussed, and illustrated on the screen, and the lecture throughout was adorned with extracts from the poets. The lantern pictures exhibited on the screen by Mr. Gale were of singular beauty.

The CHAIRMAN remarked that they had been present at what might be called a "one-man lantern exhibition," and had been looking upon the labour of a life-time. The pictures showed that each country district had its special characteristics; for instance, in corn districts the cottages were exceedingly picturesque, because of the abundance of straw for thatching.

Mr. HUSSEY considered that Mr. Gale had printed-in clouds in lantern slides iu an admirable manner.

Mr. HUMPHERY had been with Mr. Gale on some of his photographic expeditions, and had been struck by the admirable way in which he managed to get sheep into the positions he desired.

Mr. WILKINSON remarked that Mr. Gale obtained such nice groups of human figures because of his kind way of speaking; he did not order them about.

Mr. W. A. GREENE stated that he had found it difficult to get figures into Alpine views, because the men usually would not staud still for the purpose when they were out on an expedition, and that it was useful to have figures in such views, to show the proportions. With a hand-camera the difficulty is less; but the best effects are obtaiued by louger exposures.

Mr. GEORGE DAVISON, in the course of his remarks, said that nearly all the photographs contaiuing figures specially "introduced" into landscapes had been failures.

Mr. MASKELL stated that Mr. Gale, in his paper, had not spoken of the power of photography to represent values. He (the speaker) had never seen, in true values, a photographic representation of a cornfield, or of gorse.

Mr. GALE, in reply, said that he had been in the midst of the gorse commons when they were in their glory, and that to his disappointment be found that in the photographs the gorse materially detracted from the appearance of the landscape; the yellow flowers came out darker than the greens. He was not using orthochrouatic plates. When the corn was ripening he thought that it could be rendered in its true value.

The subject on Thursday, November 20th, will be "Some Old Processes of Making Lantern Slides," when Mr. Pringle will read a paper.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 6th.—Mr. T. BOLAS in the chair.

Mr. J. STEWART (Glasgow) showed two photographic lenses he had recently received from Jena, manufactured by Zeiss. They differed materially iu their construction. He had only been able to try the smaller one of 10¼ in focus, using a stop equivalent to *f*/10; this gave a negative 18 by 15 quite sharp to the edges. The focus of the larger of the two lenses was about uine inches; the front lens had a diameter of one inch, that of the back lens, hemispherical in form, about two inches.

A question was asked whether any of the known varnishes effectually protected a plate from damp?

The CHAIRMAN suggested that after a perfect washing the film should be quite thoroughly dried previous to being coated with varnish.

Mr. W. E. DEBENHAM recommended gold size; he believed no varnish to be thoroughly impervious to wet.

Mr. J. STEWART passed round a negative which had been coated with a varnish recently made by him. It had been allowed to remain out in the wet for a fortnight attached to a sheet of silver paper, without any stain or markings having set up iu the film. In using collodion varnish, a negative would become spotty sometimes in a few hours.

The adjourned discussiou of the previous week was resumed by Mr. W. E. DEBENHAM, who contributed an additional paper, which he read (see page 881).

Mr. P. H. NEWMAN followed also with a paper on the subject (see page 885).

Several of the members took part in the discussion which followed.

Mr. GEORGE NEWMAN said:—It seems to me that the power of artistic expression in photography is one of the subjects of interest most talked about in the present day, and even at this meeting the difference of opinions is, on the surface, very great. Honestly, are we uot all just a bit tired of it, and anxious to be at something else? Viewing the matter as an outsider, one can hardly help thinking that there must be something very wrong somewhere—so wrong that, even after a whole fortnight's careful study, one of the leading photographic societies of the world cannot decide how a photograph should look when done. The old story of the big-endians and the little-endians, but the simile, like the subject, is just a little stale now. One photographic prophet tells us, in cold blood, the all-detail in a picture is to be of equal sharpness. It necessarily follows from that statement that every object on the print may be converted into the principal motive at pleasure. What becomes of the fundamental rules of harmony with this happy starting-point? Then the other prophets at the opposite end of the stick—the pinhole and brown paper gentlemen! There certainly is harmony of a sort in their productions—of the blurred and smudgy sort. Then another sect, the naturalistic photography artists, the feeble imitators of artists of the Millet school, are they to be treated seriously? Well, even they also do not seem to be entirely approved of here, or, for that matter, in many other places. So, where is one to choose where so many staudards of infallibility are raised, each one with a terribly long-winded written warranty attached? Starting with the assumption that to be a photographer oue must be able to take photographs, one would have thought that upwards of fifty years would be ample time to settle all disputes as to the best method of taking them. But here we are at the beginuing! I, for one, am certain that most of the so-called art talk that goes on week after week, month after month, does harm, not good, aud is but a hindrance to good work coming to the front. An objection was made here last week to smart remarks in general, but I cannot help thinking that they are very useful things to intensify with, and that they are perfectly legitimate weapons when used, as they were then, to bring to ridicule faddists and seekers of cheap notoriety. "If familiarity can breed contempt, certainly art, or what is taken currently for it"—by these worthies—"has been brought to its lowest stage of intimacy." I say this because I mean it, apologisiug to no one. To the school who will have nature and nothing but it, and say that nature is to be taken as she is, I quote from the work of a man to whose gifts few can attain, and he says:—"That nature is always right is an assertion artistically as untrue as it is one whose truth is universally taken for granted. Nature is very rarely right to such an extent even that it might almost be said that nature is usually wroug; that is to say, the condition of things that shall bring about the perfection of harmony worthy a picture is rare, and not common at all." How little this is understod, and how dutifully the casual in uature is accepted as subliine, may be gathered from the unlimited admiration produced by a very foolish sunset. The prophets whom, for convenience, I have called the feeble imitatory school, would not need noticing but for one thing, and that is the fact of their writings being powerful because accepted of the timid ones *sans question*, and so becomes, self-elected, their preacher appointed! "He stands iu high places, harangues and holds forth." Sage of the universities, learned in many matters, and of much experience in all, save his subject; exhorting, denouncing, directing; filled with wrath and earnestness; briuging powers of persuasion and polish of language to prove—nothing; torn with much teaching—having naught to impart; impressive, importaut, shallow; defiant, distressed, desperate; crying out and cutting himself—while the gods hear not. Gentle priest of the Philistine withal, again he ambles pleasantly from all points and through many volumes, escaping scientific assertion—"babbles of green fields." Why do we seek after new masters? Is not the story of the beautiful already complete? What is there to learn that the precepts hewn in the

Marbles of the Parthenon will not ever repeat? With a multitude of new teachings surely we must be blinded.

Mr. W. E. Debenham, replying in support of his views, instanced the pictures of Luke Fildes. Pictures by this artist and others showed good definition throughout.

The Photographers' Benevolent Association.

On Friday evening, the 7th inst., the Photographic Exhibition at Pall Mall was, following the usual kindly custom, allowed by the Photographic Society of Great Britain to be open for the benefit of the Photographers' Benevolent Association. Owing, no doubt, to the inclemency of the weather, the attendance was smaller than on some previous occasions. At a quarter to nine, an admirable selection of slides was shown on the screen by means of the optical lantern; the contributors were Messrs. H. D. Atkinson, Carpenter, F. P. Cembrano, W. Davey, W. Farrington, T. E. Freshwater, H. M. Hastings, Liddle, Poulton & Sons (J. S. Rolfe), J. B. B. Wellington, and J. B. Wollaston.

In the course of his opening remarks, Mr. W. Bedford, Chairman of the Committee of the Photographers' Benevolent Association, said that during the past year more calls had been made on the funds of the Association than in any previous year of its existence, more than £100 having been granted in relief. This might be considered a matter for congratulation, as it showed that the Association and its objects were becoming better known. It was to be regretted, however, that the institution was not more widely supported by those who, at some future time, might be in such a position that they might be glad to avail themselves of its assistance. The minimum subscription was fixed at two shillings and sixpence per annum, so that the humblest might subscribe without taxing his resources. In conclusion, he asked for a hearty vote of thanks to the Photographic Society of Great Britain for having placed the Exhibition at their disposal, and to those friends who had allowed their slides to be used. This was accorded by acclamation.

All persons connected with photography are eligible to subscribe, and, in time of need, to receive assistance from the Photographers' Benevolent Association. Full particulars may be obtained on application to the hon. secretary, Mr. H. J. Beasley, 65, Chancery Lane, E.C.

The South London Photographic Society.

The meeting on Friday, November 7th, was for the purpose of hearing Mr. Banks (the hon. treasurer) recount his experiences of a "Tour in the Channel Islands." He illustrated his remarks by a number of his own views, shown by means of the triple lantern, also lent by him.

Mr. Ransom brought to the notice of the members an old device in the way of focussing screens. It consisted of finely-ground glass, in the centre of which was a transparent spot. On the application of a focussing glass to this spot, that part of the image could be sharply focussed.

The Enfield Camera Club.

The ordinary meeting of the above Club was held on the 5th inst., Mr. D. G. Pinkney, president, in the chair.

The attraction of the evening was an inspection of "Travelling Studentship" prints.

Dr. F. Cresswell and Mr. H. F. Knight were elected members of the committee.

The Sheffield Photographic Society.

The ordinary monthly meeting of the above Society was held at the Masonic Hall, Surrey Street, on Tuesday evening, November 4th, Mr. R. J. Shields in the chair.

After the election of two new members, the judges' award was announced for the annual competition; Mr. T. H. Roberts was awarded the medal for the best six pictures, also the gold medal for the best single picture—a view of Filey Beach.

Messrs. Beck and Charlesworth then gave the first of a series of "two-man lantern slide exhibitions."

Dundee and East of Scotland Photographic Association *November 6th.*—General meeting.

Mr. Peter Feathers gave a paper on "Light and Colour."

Mr. W. E. Boxer exhibited a printing-frame which he had designed for making lantern slides from quarter-plates. The front of the frame has an opening of three and one-eighth inches square. The negative, when placed in the frame, could be moved longitudinally till the part desired was opposite the aperture. The back consists of three flaps, two narrow and faced with rubber; these are at either side of the opening, and, when shut down, keep the negative in position, and are secured by a turn-button, leaving a space between them of three and a-quarter inches for the sensitive plate, which is screened from light by the third flap.

The Oxford Photographic Society.

On November 4th an exhibition of fifty lantern slides, kindly lent by the editors of a photographic newspaper, was made. After these, two sets, the Forth Bridge and the Alhambra Palace, Spain, were shown by the President, as also were some slides made by some of the members. Judging by the applause, the slides were appreciated by the twenty-six members and about eighty visitors present. Unfortunately, the night was wet. Mr. A. F. Stanley Kent, M.A. (Magdalen College), and Mr. J. R. Benson, were elected members.

The meetings of the Society are held in the Wesleyan Lecture Room, New Inn Hall Street, Oxford, and the following is the programme for the present year:—November 21st—Demonstration by Mr. H. M. Smith (Eastman Company); December 2nd—Subject not settled; December 16th—"White Mountain" slides (U.S.A.).

The officers of the Oxford Photographic Society are:—*President*—Mr. E. A. Ryman-Hall; *Vice-Presidents*—Mr. C. C. Cole, Mr. French, Mr. A. F. Kerry, Mr. John Salter; *Hon. Treasurer*—Mr. J. Minn, 15, Leckford Road; *Hon. Secretaries*—Mr. W. Davis, 73, Banbury Road, Mr. F. A. Bellamy, 82, Southmoor Road (4, St. John's Road after November); *Committee*—Messrs. B. J. Franks, W. King, W. H. Payne, H. M. Phillips, A. Robinson, G. Smith, and Rev. W. H. Price.

The Leeds Photographic Society.

On November 6th the members of the above Society held their annual exhibition of lantern slides in the Albert Hall of the Mechanics' Institute; the Exhibition was open to members and their friends. About 230 slides were exhibited, consisting of scenery in Yorkshire—on the Wharfe, Ure, Swale, and Tees; Bolton, Rievaulx, and Whitby Abbeys. The views of scenery taken farther away from home were instantaneous marine pictures from the Isle of Man and other places. The Lake district was well represented, and the castles of Kenilworth, Raglan, Warwick, Tintern Abbey, and other similar places, had received careful attention by some of the exhibitors, and some fine pictures of Continental and Norwegian scenery were exhibited.

The president of the Society, Mr. T. W. Thornton, in a few opening remarks, convinced the assembly that the Society had made much progress during the year. It had secured a lecture hall replete with convenience for experiments and general work, and the public exhibitions of the Society had been so successful that further efforts of a like character had been invited.

Mr. C. H. Bothamley, of the Yorkshire College (vice-president of the Society), announced the titles of the various slides as they appeared on the screen, and the lantern was under the charge of Mr. A. A. Pearson and Mr. S. A. Warburton, the hon. secretary of the Society.

The intervals were filled up by a selection of music performed by the Leeds Private Orchestral Society; Mr. Staniland Hall conducted.

The following are the names of the members who showed lantern slides during the evening:—Messrs. H. P. Atkinson, Godfrey Bingley, C. H. Bothamley, H. Denison, W. Denham, Dr. Jacob, A. A. Pearson, G. H. Rodwell, T. W. Thornton, S. A. Warburton, W. Wright, D. Waddington, E. H. Whitaker, and T. H. Walker.

THE NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE hundredth ordinary meeting of this Association was held on Wednesday evening at the Society's rooms, Cavendish Chambers, Market Street. There was a large attendance of members and friends, and this was the first lantern night of the season.

The CHAIRMAN, in introducing the lecturer, referred briefly to his subject, "Hand-Camera Work," and spoke upon the important position the hand or detective camera had attained in the short time it had been before the public. Considering the portability and the ease of manipulation, he thought that, for pleasant reminiscences of journeys, their adaptability would be universally acknowledged.

The lecturer, Mr. WALTER D. WELFORD, of Birmingham, said that hand-camera work had received a large proportion of his attention. He had tried its adaptability upon every subject, including street views, incidents, characters, marine studies, wave catching, animal studies, athletics, country scenes, landscapes, cloudland, Newcastle and Torquay trips, the fair, the fête, and *genre* studies. The lecture was illustrated by 150 views, shown by the oxy-hydrogen limelight, and the lecturer described the incidents and characters depicted on the screen. Street incidents appeared to be his especial *forte*. All the well-known typical characters had been secured—the arab, the lounger, the drunkard, the scavenger, and the rogue. Views obtained by "shots" taken from a train travelling at the rate of fifty miles an hour were shown. Other views were shown taken from the centre of a crowd. Views and incidents can thus be secured which, with the ordinary camera and tripod, it would be utterly impossible to obtain.

MR. N. C. DUNER writes that his recent article ought to have ended with the sixth line (formula X) on page 829. He did not intend the remainder to be printed.

THE PHOTOGRAPHIC CLUB.—The annual dinner will be held on Nov. 19th at 7 promptly. Nov. 26th, monthly lantern meeting; Dec. 3rd, collodio-bromide processes.

LITHOGRAPHY IN THE UNITED STATES.—*The Lithographic Art Journal*, of New York, says that there is a very great demand all over the country for artists, transferrers, and pressmen, and that it is very difficult for lithographic establishments to secure the necessary help; this is a most satisfactory sign of the prosperity of the craft.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—A meeting was held on the 29th of October, with Mr. W. Bedford in the chair. Two appeals for assistance were granted. Messrs. Jauley, Tayler, Hoverden, and Pask were elected as subscribers. Votes of thanks were passed to Mr. F. A. Bridge for conducting the concert on the 24th of October, and to the friends who gave their services; also to the proprietor of Anderton's Hotel, Mr. Freshwater, and the Photographic Club.

THE ROYAL INSTITUTION.—At the last general monthly meeting Sir James Crichton Browne, M.D., F.R.S., presided. Mr. Viriamu Jones, M.A., Mr. C. N. Nicholson, M.A., Mr. John Hartley Perks, and the Hon. Sir James Stirling (Justice of the Supreme Court) were elected members of the Royal Institution. The managers reported that they had elected Mr. Victor Horsley, F.R.S., Fullerian Professor of Physiology for three years, from Jan. 12th next.

THE SPHERICAL ABERRATION CONTROVERSY.—It has been suggested that our note at the foot of Mr. Dallmeyer's letter in last week's NEWS showed concurrence with the contents of that letter. Any such idea is a mistake. As most of our readers know, Mr. Debenham is not ignorant of subjects on which he writes, has a keen analytical intellect, and a large acquaintance with photographic optics. Neither do we approve Mr. Debenham's letter of the preceding week, for there is no doubt that when Mr. Dallmeyer, who is an honourable man, says that he had performed an experiment under certain conditions, he had done what he said. We thought that two very good men were getting much too heated and strong in expression over the controversy, and that it was necessary that it should close.

Answers to Correspondents.

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

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

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

PHOTOS.—*Sodium Thiosulphate* is the new chemical name for hyposulphite of soda, but, on the principle of brevity, this salt is likely to be better known, for many years to come, as "hypo." So with common alum, which is ammonium aluminium sulphate.

19TH CENTURY.—*Mr. Frederic Harrison's "New Pompeii."* The idea of a grand National Safe for the reception of works of art, select engineering models, portraits of eminent persons, and records of a century, being buried beneath Stonehenge for the benefit of future generations, implies that the stronghold, or cellar of concrete, would be a more suitable place for their custody than in the possession of ordinary mortals and government officials. Fancy Mr. Gladstone's latest portrait, or Sir John Millais' "Chill October," however well encased, being buried for years, as suggested, in a dark chamber loaded with moisture and fungoid spores! The remarks about permanent photographs, or enamels, are more to the point, but even these would be better preserved in the British Museum. The appeal may do good by paving the way for the formation of a grand national depôt, in the event of the Imperial Institute failing to take up this work.

W. T. M. D.—*Instruction.* Make enquiries at the Polytechnic Institute, Regent Street, or People's Palace, Mile End.

W. T. W.—We have seen the gentleman named in your letter, and he undertook to give you an immediate reply.

A. P.—*Hard Solder.* You have, by your experiment, merely confirmed a well-known observation that zinc and lead will not fuse together and make a uniform alloy. Two parts of lead to one of tin are the usual proportions for hard solder, and there is no advantage in employing any zinc, which would raise the melting point and serve no good purpose, although it might cheapen the cost of production.

L. F.—*Silver in the Whites of Gelatino-Chloride Prints.* By moistening the paper with ammonium sulphide, and allowing to dry in the air, you will see at once, by a dark stain, whether there is any silver locked up in the whites, as is always the case with albumenised prints.

M. T.—*Self-Vignetted Portraits.* Read again the answer to W. J. (Bolton) last week. Your scheme of introducing a cut diaphragm fixed half-way (out of focus) in the camera would have the effect of producing a negative with a *clear* margin, which would print black. This is not what is required, but the reverse. The exposed plate might be covered with a shaded oval, then held up to a gaslight for a few moments, and finally developed; but it would be difficult to get the image centred, or nicely vignetted, in all cases, by thus working in the dark.

T. B.—*Primulines.* It is of little use beginning a course of experiments on the permanence of the different qualities of developed primuline at this season of the year. Our samples were put out all day on the 5th inst. without undergoing any change, but the sunshine came to them at a low angle, as must always be the case in November. The exposed and protected halves were undistinguishable.

COLONEL WATERHOUSE.—Your reversed negatives and specimen prints were exhibited by Captain Abney at last Tuesday's meeting. See report. The requisites asked for are all now on their way to you. Try the primuline with eikonogen developer.

J. SHAW & Co.—*New Designs.* We will enquire farther, but the account states that the matter is only in the experimental stage at present.

J. DICKINSON.—One size registered would cover the copyright of all.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1681.—*November* 21, 1890.

CONTENTS.

THE POISONOUS INFLUENCE OF CERTAIN DEVELOPERS.

RECENTLY two examples illustrating the poisonous action of certain developers by absorption through the skin of the fingers into the rest of the body, have been brought under our notice. In each instance the sufferer was a well-known photographer, so that there is no question as to the authenticity of the cases.

Recently we called upon Mr. Pricam, one of the chief photographers in Geneva, who, for the credit of his establishment, turns out nothing but carbon prints, so that they shall shine in albums in their beauty when the silver photographs alongside, taken by others, shall have faded into the sere and yellow leaf. He pointed out that his fingers had broken into sores all round the edges of the nails, and said that this was due to the constant use of eikonogen in developing operations, he having used it since it was first introduced into the market, and having been in the habit of lifting the plates from the solution with his fingers. He now uses mechanical lifters.

The other case was brought under our notice last week, by the well-known photographer, Mr. Turnbull, of Edinburgh, who says that in regard to the poisonous effect of pyrogallol in the alkaline developer, he has had painful experience. He says that as an old wet plate worker, he had used the acid iron developer, cyanide of potassium, also pyrogallol with citric acid and silver for intensifying. He had also done much collodio-bromide work with pyrogallol and carbonate of ammonia, and without any ill effects. In 1878, however, on taking exclusively to gelatino-bromide, with pyrogallol and ammonia development, he began to suffer. At that time, the most convenient place he had for a dark room had not water laid on; he had, therefore, to use water carried up to it. At that time, also, the method of developing, holding the plate in the left hand, as when wet plates were used, was common, and as the time of development is much longer with gelatine than with wet plates, the developer was more liable to run down the fingers and hand. The first notice he had of anything wrong was a feeling of itching on the knuckle of the little finger of the left hand, whence the developer often used to drip, and, as he was frequently interrupted at work, he sometimes left the room without his hands being washed, consequently the waste developer partly dried on them. The itching gradually spread over the back of the hand and fingers, then slowly extended up the arm. The other hand and arm next became affected, and small pimples, which became moist, spread until the whole surface of his hands and arms was nearly covered. The face and neck also became affected, principally at the backs of the ears, the sides of the nose, the skin above the eyelids and under the eyes and chin.

In the course of a few weeks the complaint spread to the legs, the inside of the thighs and knees being worst. He had the best of medical advice, and although the various doctors agreed that it was some particular form of eczema, he had no permanently beneficial treatment from any of them. For five years he was more or less ill—so ill, that at one time he was a perfect wreck. By entirely giving up development, by keeping himself interiorly in good order, by plain living, by avoiding much imbibition of stimulants, and by taking much out-door exercise, the disease abated. He indulged in cycling in summer and walking in winter, and he now finds himself in good health, though when he at any time develops with pyrogallol and ammonia, the old symptoms of heat and irritation reappear.

That pyrogallol has an adverse effect upon the health of certain individuals has long been known; whether all persons are equally liable to such attacks is doubtful. Pyrogallol is a more dangerous substance than is generally recognised; indeed, Mr. Vincent Elsden, in his table in our YEAR-BOOK about the poisonous properties of certain photographic chemicals, says that two grains of it will kill a dog, and that the symptoms are like those produced by phosphorus. Questions relating to the poisonous action of photographic chemicals are of general interest, so perhaps some of our medical readers and others will help to throw additional light upon these subjects.

ON PHOTOGRAPHING INTERIORS.

At this season of the year, when out-door work is becoming less and less possible and desirable, the attention of photographers may conveniently be directed to the production of negatives of interiors. In the brilliant summer time one is often tempted to put off such work to a more convenient season—for photographs of interiors mostly mean long periods of exposure—and in the time thus occupied, one is apt to argue, three or four landscape studies might be secured. The more convenient season is obviously found in the fall of the year, when the trees are shorn of their foliage, and when nature wears a sombre hue generally. Certainly, under such conditions, the long exposure necessary becomes longer; but when we remember that interior photography is possible even in rainy weather, we are willing to sacrifice a little extra time in consideration of the fact that we are able to work at all.

In no department of photography, perhaps, is greater advance shown than in pictures of interiors, and it is only natural that this should be the case; for in the days of wet plates—in spite of many ingenious plans for keeping the film moist—the photographer was always nervous about the condition of his plate, and would be apt to cap his lens long before it had had time to do its full work. The result was seen in those hard contrasts—black shadows against white windows—which characterised interior photographs of a by-gone era. Things are very different now. We know that in the case of an interior, however long the time may be for which we leave the gelatine plate exposed to the action of the light in the camera, it cannot very well be spoilt, some workers going so far as to say that a negative of a dark interior cannot be over-exposed. This statement, of course, requires a little of the proverbial grain of salt before it can be literally accepted; but we may go so far as to say that the limit of over-exposure of such subjects is a very wide one.

There is no doubt that the gelatine plate has, beyond the lasting property already referred to, other advantages which commend it for use for interior work, and the chief of these is the wonderful gradation of tones which it is capable of affording. In a good interior photograph of a modern drawing-room, for instance, where textile fabrics of different kinds enter so largely into the decoration of the place, it is possible to say which is velvet and which silk. Still more is the beauty of the process brought out in the delicate shadows which are found on crumpled satin, and the pearly tones on almost any material which is white, or approaching white, in brightness. In our opinion the wet collodion process under the best conditions could not render these delicate tones so well, and this is especially observable in the case of snow. Compare a wet plate negative of a snow scene with a similar picture taken on a gelatine plate, and the difference in the half-tones will be seen to be quite remarkable. This wonderful softness of effect possible with a gelatine plate is unconsciously recognised by certain old stagers who are occasionally heard to hanker after the "vigorous negatives" which they used to obtain with wet collodion.

Interior photographs are by no means difficult things to take, for the element of movement is, of course, eliminated. Provided that great care be taken in choosing the point of view, and in levelling the camera, and focussing it, success is sure to follow. In church interiors the windows used to be the stumbling blocks, especially if they were not filled with stained glass, for, in spite of the precaution of backing the plate, halation was sure to show itself more or less. By using a plate with a ground glass back, or a film, this fault is almost altogether obviated, while in the case of coloured windows, the use of an isochromatic plate is at once indicated. It will thus be seen that the worker of to-day has all kinds of advantages in photographing interiors which were undreamt of a few years back.

But the photographer is not confined to interiors of churches or public buildings, for in this age of luxurious living the interiors of private houses often afford the most exquisite pictures. Our forefathers knew little of this lavish domestic decoration, and what there was of it was confined to palaces and large mansions. The upper middle class were content to have everything solid and good, and these terms were too often synonymous with inteuse ugliness. Now, however, it is the fashion for a rich man to spend a large sum on the adornment of his house, and a new trade has arisen to minister to his wants. Modern decoration does not so much depend upon the upholsterer as of yore. Ceilings are painted, walls are freseoed, or perhaps hung with modern tapestry which vies with that of the famous looms of the past, and the richest hangings give completeness to the whole. Photographers would do well to hang in their reception rooms a few photographs of such domestic interiors as these, in order that their wealthier patrons may be tempted to have their homes depicted in the same way. A new branch of work might thus be initiated, which, as we have pointed out, can be carried through at a time when other photographic operations are wont to go slow.

Derby Photographic Society.—The monthly meeting of the above Society was held at Smith's Restauraut, Victoria Street, on Tuesday; Mr. Richard Keene presided. Mr. H. M. Smith, of the Eastman Dry Plate and Film Company, exhibited their products. A collection of enlargements on their bromide paper was exhibited, together with the Kodak cameras, and a lecture was given by Mr. Smith on enlarging on bromide paper, with a demonstration.

A Wire Screen Background.—This is a most useful little device which we recently saw in use by Mr. Hodges and Mr. Harley, while photographing an assortment of cut flowers in some orthochromatic experiments. It consisted of a light wooden frame of about three feet square, with a couple of cross-pieces to serve as feet, so that it could stand upright on a table or bench. Over this was stretched a piece of wire gauze, such as is employed for window screens; and, of course, it was the easiest possible thing to fix the sprays in any desired position on the wire. A background of any required shade could be placed behind, or light reflected through the gauze at any desired angle. The convenience was great and the effect beautiful. Many other uses will suggest themselves to the ingenious photographer for this simple addition to the studio.—*The Beacon.*

THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION IN EDINBURGH.

Last Friday an International Photographic Exhibition was opened at Edinburgh in a suite of rooms in the home of the Royal Scottish Academy of Paintings, Sculpture, and Architecture. This building is in the centre of "Modern Athens," as Edinburgh is appropriately and commonly enough called; it is on a piece of ground which, at a fair elevation, spans the valley which cuts the city into halves, and from its terraces the views are picturesque in all directions. The Academy building is of the Ionic order of architecture, and harmonises admirably with its surroundings. It was founded in 1826, and the Academy received a royal charter in 1838. Its meetings were held in the Royal Institution of Edinburgh at the outset, and subsequently in Waterloo Place. In 1850 the foundation stone of the present building was laid by the late Prince Albert, and the edifice contains the rooms of the Royal Scotch Academy and of the National Gallery. The whole building is now much too small to meet all the demands upon its space for artistic purposes. Its public rooms, including those in which the Photographic Exhibition is held, are all octagonal in shape, and that shape is not the best for the hanging of pictures. The president of the Academy is Sir William Fettes Douglas, and the secretary Mr. George Hayes.

The Photographic Society of Edinburgh, under whose auspices the Photographic Exhibition is held, was founded in 1861, and has now over 400 members. It was preceded by the Photographic Society of Scotland, founded about 1849, and composed of influential members, some of them of considerable celebrity. Sir David Brewster was one of its members, and read some of his papers on optics at its meetings. It held some exhibitions, and occasionally some good papers were read before it, but gradually fell into a lethargic state and faded away like a summer cloud, without anyone being able to say that it died at a particular moment. Before its death, and in the year 1861, the Photographic Society of Edinburgh was founded by a few active spirits, including Mr. J. G. Tunny and Mr. J. Traill Taylor; Mr. John Nicol, now editor of *The Beacon* at Chicago, was also among the founders. The new Society did excellent work, as proved by the photographic journals of the time, and it held occasional exhibitions. One of its features was the giving of lantern entertainments to members and their friends; these began in 1864 in the small hall of the Royal Society of Arts, and became so popular that, about 1867, they had to be removed to the larger Queen Street Hall, which holds about 900 persons. Three or four of these lantern entertainments are given there every winter. Among the public lectures given under the auspices of the Society was one by Professor Piazzi Smythe about the photographing of the interior and the exterior of the Pyramids.

One of the founders of the Society, the late Mr. Tunny, died three or four years ago; he claimed to have acted upon Le Gray's suggestion, published in 1849, and to have used collodion in photography before Archer. However that may have been, he has no public claim in the matter, because he did not make the method known. The albumen process survived in Edinburgh some years after the introduction of collodion, and in 1851 Ross and Pringle, of Edinburgh, obtained a medal at the Exhibition in Hyde Park for photographs on albumen. A story is told that at one time Tunny taught the collodion process as a trade secret, and a man came over from Fife, and paid to be initiated into the mysteries thereof; upon his return home he wasted gallons of chemicals, but could obtain no trace of a picture, whereupon he drew conclusions not complimentary to his teacher. Mr. Tunny went to Fife to see about the matter, and found that his pupil had followed his instructions faithfully—except that he never drew the shutter of the dark slide!

The following are the members of the Executive Council of the present Photographic Exhibition.

President—*Hippolyte J. Blanc. *Vice-Presidents*—*Dr. Drinkwater, F.C.S., and *W.T. Bashford. *Council*—Hugh Auld, *Alex Ayton, Jun., *Andrew H. Baird, James C. H. Balmain, *Herbert W. Bibbs, Hugh Brebuer, *James Crichton, *William Dougall, Alex. M. Forbes, *William Forgan, William Hume, Alexander A. Inglis, *James Jameson, *G. G. Mitchell, *W. B. Mitchell, *F. P. Moffat, *John Stewart Smith, *John M. Turnbull, *T. Wardale. *Treasurer*—*James M'Glashan, 60, Dalry Road, Edinburgh. *Secretary*—*Thomas Barclay, 180, Dalkeith Road, Edinburgh. *Assistant Secretary*—James R. Roddick, 13, Mentone Terrace, Edinburgh. Honorary members of the executive council, the secretaries of photographic societies in Great Britain.

The following medals will be awarded to the more meritorious exhibitors:—

A Gold Medal for the Picture which possesses the highest degree of merit, irrespective of Size or Subject.—One Silver and one Bronze Medal will be given in each of the under-noted Classes:—Class I. Landscape, 8½ by 6½ ins. or under. Class II. Landscape, above 3½ by 6½ inches. Class III. Portraits, below whole-plate size, in sets of twelve direct prints. Class IV. Portraits, 8½ by 6½ up to 10 by 12 inches, in sets of six direct prints. Class V. Portraits, above 10 by 12 inches, in sets of six direct prints. Class VI. Single Figure Studies, not to exceed 15 by 12 inches, direct prints. Class VII. Combination Printing. Class VIII. Genre Pictures. Class IX. Instantaneous Pictures. Class X. Architecture and Engineering. Class XI. Scientific—Micro-Photography, Botany, Astronomy, Geology, Surgery, &c. Class XII. Landscapes, half-plate and under, confined to Amateurs. Class XIII. Landscapes, above half-plate, confined to Amateurs. Class XIV. Photographs, any subject, confined to Amateur Members of the Edinburgh Photographic Society, Class XV. Pictures which have previously obtained a Prize. Class XVI. Lantern Slides, in sets of six. Class XVII. Reproduction of Pictures by any Process not Mechanical. Class XVIII. Vitreous Enamels. Class XIX. Photo-Mechanical Prints. Class XX. Enlargements, which must be accompanied by Original Negatives. Class XXI. Apparatus, Materials, Processes. Three Silver and Three Bronze Medals to be awarded according to the discretion of the Judges.

The previous great photographic exhibition—for there have been several small ones—was held under the auspices of the Society in 1876.

In addition to the artistic aspects of photography, attention is given in the Exhibition to the following subjects:—

History of Photography.—Specimens of the earlier processes.

* Members of Council of the Edinburgh Photographic Society.

Views, and portraits of eminent characters by such process ; of the inventors themselves if available. Optical and mechanical appliances used in working the earlier processes. Daguerreotype, heliotype (Niepce), photogenic drawings, calotype, collodion positives, &c. Specimens of miniature painting on ivory, and silhouettes in vogue immediately before and during the early days of photography.

Applications to Science.—Astronomy—Photographs of the sun, moon, stars, nebulæ, comets, eclipses, photo survey of the heavens, spectroscopic observations. "The Revelations of the Microscope" photographed in any branch of study. Meteorology—Specimens of daily records, natural phenomena, lightning, rain, clouds, sunsets, rainbows, halos. Physical phenomena photographed in the laboratory, or in nature. Geological, botanical, and zoological specimens photographed. Medicine and surgery. Anthropology and archæology. Engineering and architectural—Photographic records of works in progress. Plans ; blue and black processes (white lines on blue, blue lines on white).

Technology.—Applications to the printing and illustrating trades—Photogravure, litho, zinco, collotype, autotype, Woodburytype, stannotype, helio-chromo, &c., &c. Appliances for the production of these, when not too massive for transport. Books and periodicals illustrated by means of these processes.

The Exhibition was opened last Friday night, and the appended report of the proceedings is quoted from the *Scotsman* of last Saturday :—

The International Exhibition of Photography, promoted by the Edinburgh Photographic Society, was opened last Friday with a conversazione in the Royal Scottish Academy Galleries, at which the Lord Provost delivered an inaugural address. A large and brilliant company was present, and during the greater part of the evening the Galleries were uncomfortably crowded. Though the opening ceremony was announced to take place at eight o'clock, it was nearly nine when the president of the Society, Mr. Hippolyte Blanc, mounted a temporary platform in the central octagon in company with the Lord Provost.

In introducing his Lordship, Mr. Blanc took occasion to explain that the Edinburgh Photographic Society was an association of about four hundred members, which had existed and carried on successful work in photography for about thirty years. The objects of the Association were to discuss whatever pertained to photography, and to propagate a knowledge of the art. This was not the first exhibition held in the city, for in 1876 the Edinburgh Photographic Society ventured a similar exhibition, but under much less favourable conditions. The result was highly satisfactory. There had been an excellent surplus, and upon that surplus the present exhibition had been floated. But in 1876 they were not able to present to the public the manifold items of interest such as were displayed on the walls that evening. Photography, although well advanced, was really only in its dawn at that time ; it was the photography of portraiture. Now they had the application of photography in every field of art, literature, and science. It had been desired that the Exhibition should not be merely a show place for pictures and material appliances for photographic purposes, but that it should at the same time have an educative aim, whereby all who had the slightest shadow of an idea of photography might learn how that shadow could become a living and intelligible substance. During the course of the Exhibition, there should, therefore, he said, be a series of lectures in which the technicalities of photography would be dealt with by gentlemen well qualified to take up the respective subjects. He concluded by presenting his Lordship, on behalf of the Executive, with a copy of the catalogue and a couple of season tickets—one for himself, and another for Mrs. Boyd.

The Lord Provost compared the galleries, illuminated with a brilliant light, adorned with sun pictures, and peopled with ladies and gentlemen wearing the sunflower, to a temple of the sun. From the extreme east to the far west, he said, there were traces of the sun worship. In the sculptured stones of Nineveh and the pyramids of Egypt, in the temples of Greece and Rome, the circles at Stonehenge and Steunis, the cromlechs of Scotland, and the monoliths, sculptured and unsculptured, they had traces of that old sun worship which pervaded the whole face of the globe. It was interesting, too, to think how these traces were still to be found in the shape of our churches, and how they came still more home to us in the Yule log, the May morning celebrations, and the mistletoe bough hung up at the close of the year. As vestiges of the old worship so prevalent in the early stage of the world's history, it all came home to them. Proceeding, his Lordship expressed the pleasure it gave him to assist at such a ceremony. He had been told that there were about 1,200 frames in the Exhibition, and as many frames included a large number of specimens, the display, it would be seen, embraced a collection indicative of much labour and industry on the part of those who practised photography. They had to thank the Association for their arrangement of the treasures committed to them, so that visitors might learn the progress which photography had made from year to year since its commencement half a century ago. He did not know that any more pleasant occupation for one's leisure hours in the country could be found than photography, and he was quite sure it had served not only to give a great deal of pleasure to those who had practised it, but it had been of immense value in connection both with science and with art. They had far more to expect from photography in the future than they had to congratulate themselves on receiving in the past. It was hoped that they might some day be able to photograph colour as well as form, but in the meantime they might congratulate themselves that so much had been done, and do all in their power to encourage the study of the art.

On the motion of Dr. Drinkwater, a vote of thanks was awarded to the Lord Provost, after which the company spent some time examining the collection. A string band of the Queen's Own Cameron Highlanders played selections during the evening.

Five octagonal rooms and a vestibule are devoted to the purposes of the present Exhibition; the central room is the largest. About 1,200 photographs altogether are on view.

The apparatus on view includes the cantilever enlarging lantern exhibited by Mr. Hume, the nature of which may be explained by the aid of figs. 1 and 2. At the rear is a duplex paraffin lamp, in which the tops of the flames are inclined towards each other to obtain more light. The flat sides of the flames are turned towards the condensing lenses. The distance of the flames from the condenser may be adjusted by means of a large metal cone, which will move backwards and forwards within the large annular metal adjunct represented in fig. 1. Diaphragms with circular apertures of various diameters may be inserted in front of, and not far from, the flame. A small ruby window at the back of the lamp permits the flames to be seen, and transmits a light suitable for use when developing. For half-plate negatives a condenser 8¼ inches in diameter is used; all the condensers are strongly mounted in brass cells. In the midst of the apparatus the condensers are firmly seated in the stout mahogany frame on which the other essential parts are hung. A leather bellows of suitable length permits convenient adjustment for focussing the picture when different sized enlargements are being made. The bellows, being mounted upon mahogany frames, are easily removable for their better preservation, and also to adapt the stage of the lantern for the projection of physical experiments, as in fig. 2, in which a voltameter is represented with its battery attached. The voltameter is so placed that an image of the two glass tubes, with their con-

tents, can be projected on the screen. The sliding adjustment in fig. 1 is effected by means of polished and well-fitting brass tubes, which give an easy motion, and furnish a ready means of finding the correct position for the intended picture.

Mr. Hume also has on view some prints produced on various fabrics by means of the diazotype process, which prints have been sent to him from London, at his request, by the inventors. Those on cotton and woven fabrics are mostly of inferior quality, not likely to create opinions in favour of the process by their public exhibition. In some frames upon the walls of the rooms are three or four better specimens.

Mr. J. M. Turnbull exhibits miscellaneous apparatus, including several specialities of his own, in the devising and construction of which much thought and care have been exercised. For instance, in his hand-camera, he tries to meet the published requirements of several

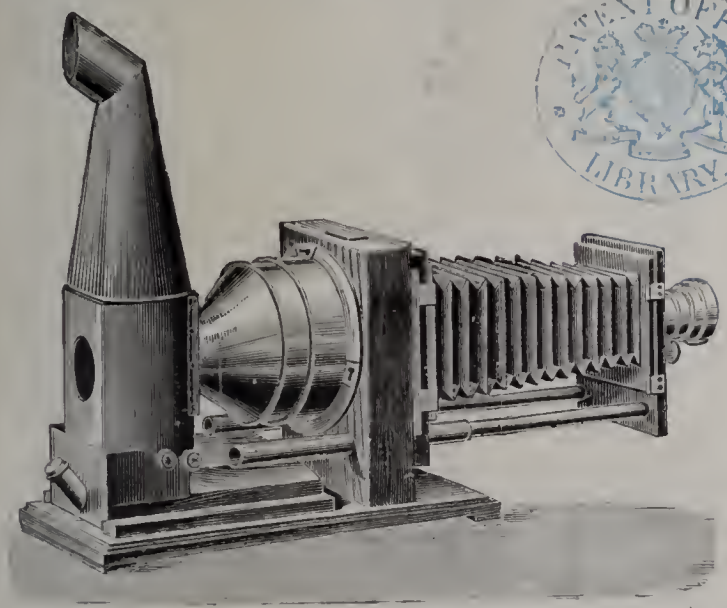


Fig. 1.

photographers. This camera is represented in fig. 3. It has a plain leather-covered case, with no projections outside, for quarter-plate. It is $8\frac{3}{4}$ inches in length, $4\frac{5}{8}$ inches in breadth, and 6 inches in height, and is carried by a small leather handle; it weighs, without slides, $1\frac{3}{4}$ pounds, and with six double slides is 3 pounds 2 ounces; it is supplied of $\frac{1}{4}$-plate, 5 by 4, or $\frac{1}{2}$-plate

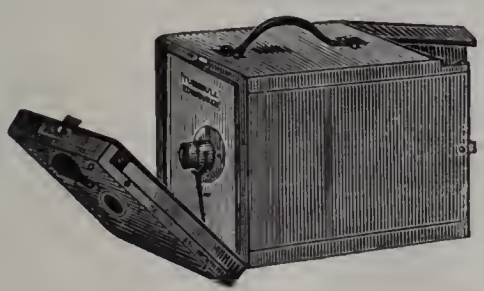


Fig. 3.

size. It opens at the ends only; one end opens to the lens and shutter, and the other end to admit the slides. When not required for shutter work, it can be screwed on a tripod and used as an ordinary camera. Two small finders are attached to the camera. A focussing screen is also supplied, but is only required when the camera is used on a tripod for time exposures. An advantage in this camera is, that it is either a hand-camera of plain and unobtrusive appearance, or, after placing it on a stand and putting in the focussing glass, the image can be seen in the usual way; it is, in fact, a hand-camera and an ordinary camera in one, and can be fitted with six of Turnbull's film slides, half the thickness and weight of plate slides, or with Eastman's roller slide. The lens used with this camera is a rapid rectilinear of six inches equivalent focus, stated to cover the plate well with the full aperture of *f*/8. It has an adjustment for focus, and is marked for 12, 20, 30, and 40 feet, and farther or intermediate distances

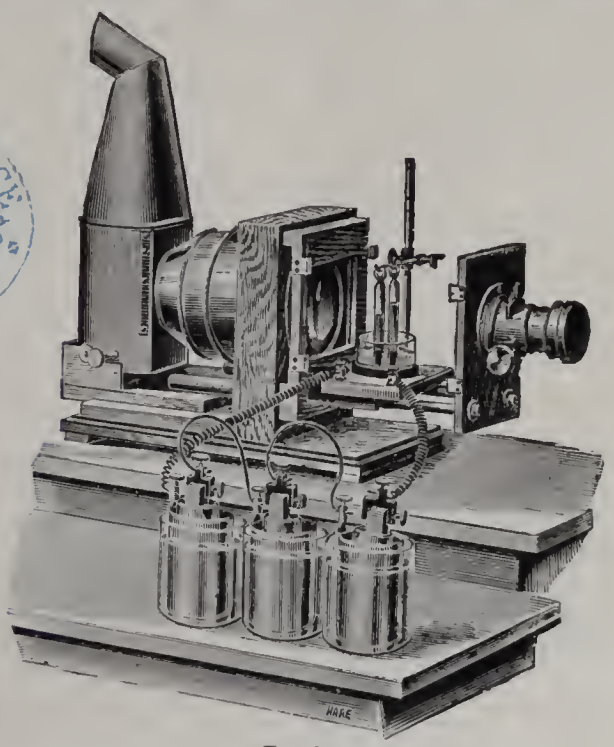


Fig. 2.

A set of standard stops is supplied with the lens. The shutter is the "Waverley Express Shutter," which opens and closes from the centre, and has a speed regulator. The slides are of the American type, with ebonite or celluloid shutters, which pull entirely out when exposing the plate.

One of the most ingeniously devised things in the Exhibition is Mr. Turnbull's walking-stick stand made, all but the case, of peculiarly shaped tubes of thin metal; the metallic legs are hollow at all parts. How they will resist wear and tear we know not. When the legs are first pulled out of the wooden walking-stick case, they look like a walking-stick themselves, being each in horizontal section in form like the segment of one-third of a circle. Each of these tubes contains two other hollow tubes, connected at their lower ends; the section of each of these smaller tubes resembles that of one-sixth of a circle. These smaller tubes bend outwards to form the fork of the upper part of each leg, for connection with the triangular head of the stand in the usual way; greater height is thus obtained than usual with walking-stick stands. All stands of the walking-stick class are more useful when there is little

or no wind. The legs just described are made of specially drawn, thin, hard telescope tube.

Mr. Turnbull also exhibits a folding developing-room lamp for tourists, made on correct principles. It is of rectangular form, and neither of its four sides is opaque; all of them are covered with translucent red cloth. Such lanterns should never have an opaque side, because, if the light be safe which emerges from the window nearest to the developing dish, the same kind of light from the other windows cannot do any harm, and serves to illuminate the room. By the time the rays from these other windows have reached the walls of the room and been partially reflected therefrom, they are far too weak to do any harm. The lamp is small—too small for a candle to be conveniently used inside—so Mr. Turnbull issues with it some specially made "night-lights" of paraffin, in the central wick of which is a fine wire. Mr. Turnbull also has some film carriers on view.

For a time we turn aside from the commercial exhibits, to deal with an interesting collection of pieces of apparatus of historical interest, displayed upon one of the tables near the entrance to the Exhibition.

Among these is a very old portrait lens by Voightlander, made for the firm of Ross and Pringle, of Edinburgh. The lens is so long that it has a special support in front; it has a working aperture of 3¼ inches, and the focus is but 2¼ inches from the back element of the combination. For many years this lens was in use in Edinburgh, chiefly for the taking of portraits of children by the wet collodion process. The lens has no stops. It is placed on public view by Mr. Thomas Pringle.

An old camera of very small size, constructed about 1856, is exhibited by Mr. Turnbull. It has a flap shutter, and a magazine for carrying and sensitising four wet plates of the size of the glasses of mounts for the microscope—3 inches by 1 inch. The plates are exposed inside the nitrate of silver bath; each plate faces a glass window in the bath, and the exposures are made through the windows. By means of a camera of somewhat the same type, arranged to expose but one instead of four plates in a bath, Professor Piazzi Smythe photographed the interior of the great pyramid about twenty years ago. Like the "kodak," this camera has lines upon its exterior to indicate the angle of view. Mr. Turnbull also exhibits one of the old pantascopic cameras, still in good working order.

Mr. E. Lennie exhibits Sutton's panoramic camera, with its lens and its curved glass plates; also its beautifully made curved printing frames, and some photographs taken with the instrument some fourteen or fifteen years ago. One of the views contains the likeness of Mr. Burns, a photographer well known to the past generation in Edinburgh.

Mr. J. Mackean, of Leith, exhibits Aird's original hand-camera, with its magazine of plates held in sheaths, constructed, we are told, in 1872, and fully described with drawings at a meeting of the Edinburgh Photographic Society in March, 1875. The instrument consists of an upper and a lower box; the upper one forms the camera, and each sheathed plate is drawn up in turn for exposure, displacing the focussing screen when it reaches the upper box. When exposed, the plate is lifted from the front and dropped into position at the back. Collodio-bromide emulsion dry plates were used with this camera.

Several curious old-fashioned stereoscopes and monoscopes are on view, dating from 1856 to 1859.

(To be continued.)

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

The French Photographic Society—New Developer—Experiments with Eikonogen—Photo-Chronographic Researches—Universal Camera—Property in Photographic Work—Photographic Congress of 1889—Progress of Collography—Death of M. Gaillard.

The French Photographic Society.—The Photographic Society of France had its opening meeting on November 7th. The proceedings in the first place were for the refilling of the presidential chair, vacated by the death of M. Peligot. The Society, on my proposition, elected by acclamation M. Janssen, of the Institute. The post belonged, so to say, by right to the illustrious astronomer, who was one of the first to make such a remarkable application of photography to the purposes of astronomy. M. Janssen has never ceased to interest himself in the progress of photography, and to follow it closely. It was he who designated the photographic objective by the words "the retina of science of the future." The Photographic Society could not place itself under higher patronage, or under more learned and intelligent direction.

Yxol Developer.—A new developer has made its appearance. It is called yxol by its inventor, M. Lacoste Delperier. The formula has not been given, and the presentation has, therefore, only a modified interest. It remains to be seen what we have to expect from this reducing agent. Later experiments will show.

Experiments with Eikonogen.—M. Reele gives a conscientious summing up of a set of experiments made to compare eikonogen with hydrokinone. According to him, the latter product possesses a powerful reducing action considerably exceeding that of eikonogen. Relying upon the exact proportion of the divers elements necessary to the preparation of a rational developer, he has prepared one which he names "Lightning," the merits of which he highly extols. Samples of this compound were distributed to the members.

Photo-Chronographic Researches.—Mons. Marey, member of the Institute, is pursuing his photo-chronographic researches. He has brought to perfection an apparatus which serves to photograph two distinct views at intervals of time of very small separation. He is now easily enabled to adapt to it pellicular bands of sensitised film, by means of which he can obtain as many as fifty different views of the same moving object within the space of a single second. The apparatus is endowed with extreme rapidity; the band is unrolled with a continuous movement, but a grip, which comes into action just before a periodic exposure, regulated according to the number of impressions that it is desired to obtain, causes a sort of halt, which suffices to establish regular intervals between each image. M. Marey arranges his sensitive bands on an axis, around which they roll. The two ends of the

band are continued by black or red paper, thus permitting the change of reels to be made in a full light. This arrangement—or rather, this collection of improvements—adds to the greater precision of the images suitable for studying the movements of animals.

Universal Camera.—Messrs. Gilles Brothers have completed a universal camera conformably to the specifications adopted by the Photographic Congress of 1889. The instrument is very well made, and responds to all possible requirements.

Property in Photographic Work.—The President has given an account of what passed at the Congress held in London relative to property in photographic work. M. Bulloz, of the firm of Braun, and M. Davanne represented at this Congress the photographers of France. On their proposition the Congress supported the view that photography ought to be treated, in so far as the protection to be awarded to it goes, on a level with the other graphic arts. In this manner the question of pure art is avoided, and artists are no longer irritated and chafed by asking them to assimilate photographic productions to works of art; photography is thus put in the same category with engraving, lithography, and drawing in general. It remains to see this proposition sanctioned by the Congress at Berne, where already the question has been treated with less favour. Perhaps, this time, a better result may be arrived at.

Congress Documents. — Monsieur Pector, Secretary-General of the Congress of 1889, has deposited at the Bureau a collection of reports and documents relative to the Congress. This volume is very well arranged. We find in it models and drawings of the tickets, marks, and coloured scales traced by divers apparatus, and inscriptions conformable to decisions of the Congress. This last publication, edited with great care by Messrs. Gauthier-Villar and Sons completes the first parcel of the "Procès Verbaux and Resolutions," published by the National Printing Office. We have in this collection everything relating to the Congress of 1889.

Progress of Collography.—M. Gravier showed albums sent by Messrs. Lorilleux as evidence of the quality and variety of colours of their inks. The Lorilleux inks are in great demand for photo-collography, and, thanks to them, we may obtain proofs fit to rival the most beautiful engravings.

Obituary.—M. Gaillard (Paul), one of the oldest and most distinguished of photographic amateurs, founder of a prize of 500 francs for improvements to be introduced into pellicular photography, has just died. He had been one of the Committee of Administration of the French Photographic Society from its commencement.

Photographic Society of Great Britain.—Technical meeting, Tuesday, November 25th, at 5A, Pall Mall East, at 8 p.m. ; open at 7 for reading journals.

Douglas (Isle of Man).—An amateur photographic society has been formed in this town in connection with St. Thomas' Church Guilds. The Society has been named the Douglas (Isle of Man) Amateur Photographic Society. Mr. J. M. Nicholson was elected president, and Mr. R. W. Killey, 16, Sydney Street, Douglas, Isle of Man, hon. secretary.

Photographers' Benevolent Association.—At the meeting held on the 14th inst., Mr. W. Bedford in the chair, three applications for assistance were considered, two of which were granted. Messrs. Arthur Weston, E. C. Boucher, H. P. Collins, and H. R. Hume were elected subscribers. The result of the Photographic Club entertainment was £10 18s. 10d. profit.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Ferrocyanide of Potassium in the Quinol Developer—Film Stripping—Gelatine Dry Films on Mica—Two Novel Modes of Intensifying—Combined Pyro and Quinol Developer.

Ferrocyanide of Potassium in the Quinol Developer.—As an outcome of many careful experiments with quinol and its variations, I find the following formula with ferrocyanide of potassium, which addition was recommended some time ago by Capt. Himly, to be one giving most satisfactory results, more especially in the case of portraits. It gives more brilliant light lights and softer half-tones than any other developer which I have tried. I make up the following solution :—

Quinol	...	...	...	25 grammes
Sodium sulphite	...	...	...	200 ,,
Distilled water	...	...	...	750 ,,

The quinol is dissolved in the water, then the sulphite is added, and dissolved also by shaking. The solution is then filtered, and finally there are added to the same :—

Carbonate of potassium	...	...	300 grammes

With this developer I begin development, and as soon as the first details are out, I add to 100 c.c. of the above developer 5 to 10 drops of a solution of :—

Ferrocyanide of potassium	...	...	...	10 grammes
Water	...	...	...	100 c.c.

Development then proceeds quickly, so that the exposure may be considerably shortened. The resulting negative is splendid.

Stripping the Film from an Ordinary Gelatine Plate.—As a trustworthy method of stripping the film from an ordinary gelatine plate, the following plan is recommended in the *Deutsche Photographen Zeitung.* Before stripping, the negative must be freed from the varnish, which is done best with methylated alcohol, or with a solution of 1 gramme of caustic potash in 100 c.c. of ordinary alcohol. The negative is then placed on a levelling stand, and coated over its whole surface with a rather thick film of two per cent. plain collodion ; after setting, the plate is thoroughly rinsed with water, until all greasiness of the film disappears. The plate is then placed in a solution of ten drops of hydrofluoric acid in 100 c.c. of water ; the solution should not be used stronger, as otherwise the film would probably frill. In order to avoid this failure entirely, it is well to add to two parts of the above weak hydrofluoric acid solution one part of alcohol or spirit. As soon as the film begins to loosen at the edges, the plate is removed from the bath and rinsed carefully, but thoroughly. After washing the plate is, with the film side up, placed on a soft support (a few sheets of moistened blotting paper), covered with a moistened (not wet) smooth piece of good letter paper, and the latter slightly pressed by means of the ball of the thumb or by an india-rubber squeegee. The paper is next very carefully stripped off, together with the film ; if this is done skilfully the film will adhere well to the paper ; the latter should have been cut a little larger than the film. In order to remove the paper from the film, and at the same time to give to the latter a suitable support, a well polished glass plate, a little larger than the stripped picture, is well-rubbed with tale powder, then coated evenly with collodion, rinsed with water, and placed aside for

about five minutes to drain. The still moist plate is then coated with a twenty per cent. gelatine solution, and completely dried on a levelling stand. Such plates keep well, so that they may be placed in stock. After drying, one of these plates is placed in a dish with cold clean water, and at the same time the paper together with the film is placed in the water; the whole is then brought in contact under water, and without producing air-bubbles; the plate is next removed, and is once more squeegeed and the paper stripped off while still moist. After drying, a sharp knife is passed through the edges, and the film, which has become a rather strong and flexible film, will easily leave the glass, and may then at once be used for printing.

Mica as a Support for the Gelatino-Bromide Film.—The firm of Oswald Moh, of Görlitz, has introduced an interesting novelty consisting of gelatine plates coated on mica in place of glass. This mineral, known as potash mica or muscovite, is found at some places in considerable dimensions and quantities, so that large films of mica, up to one square foot in size, may be obtained at a comparatively low price. If cut to thin plates this kind of mica is almost colourless; besides, it is very light, twenty to forty pieces weighing only as much as a glass plate of the same size and of average thickness. Dr. Miethe, who has tried these new plates, states that the prepared mica surface is twelve to twenty-three times lighter than a prepared glass surface. It may be exposed in any dark slide, and neither during development, nor in any other liquid, do the films show tendency to roll up; on the contrary, they remain perfectly flat, sticking slightly to the bottom of the developing dish, so that when the latter is rocking they remain still. The finished negatives are equal in appearance to glass negatives, and they may be bent and warmed during varnishing without fear of damage. They may, of course, be printed from both sides.

Two Novel Modes of Intensifying Gelatine Negatives.—The following original method of intensifying is suggested by R. E. Liesegang. If a finished negative is placed, after drying, once more in a water bath, a slight relief is produced on the film, the darkest parts of the image lying deepest. The relief remains also after the negative has been dried. If it be now rolled up with an easily drying red or black ink, like a collotype plate, the ink will adhere fastest to the darkest parts, while it is rejected by the unexposed parts of the film. By this method a very strong intensification is obtained. Dr. Stolze describes another method of intensifying, which depends on the behaviour of the bichromated gelatine. The negative is treated for a minute with a four per cent. solution of bichromate of potassium, and then dried. After a rather long exposure from the back it is thoroughly washed and again dried. If the negative be now placed in an aqueous solution of Indian ink, the latter will be absorbed by the unexposed and soluble parts of the film, which are intensified by it, while the exposed parts of the film are not affected by the solution. Liesegang remarks that this method has proved very successful in his hands in cases where but a slight intensification is required.

Combined Pyro and Quinol Developer.—Dr. C. Schleussner, of Frankfort-on-Maine, one of our most eminent gelatine plate manufacturers, recommends the following developer, which, as I may state, gives excellent results, at least with plates of the above-mentioned factory. It gives fine details and high lights, and quick-printing negatives of beautiful colour. The following stock solutions are made up:—

Solution A.

Quinol	20 grammes
Distilled water	... 2,000 c.c.

Solution B.

Carbonate of potassium ...	100 grammes
Distilled water	500 c.c.

Solution C.

Distilled water	400 c.c.
Sodium sulphite	60 grammes
Diluted sulphuric acid	10 to 20 drops
Pyrogallol	20 grammes

At first the sodium sulphite should be dissolved and acidulated with sulphuric acid, then the pyrogallol added. For use, mix:—

Solution A	40 parts
Solution B	10 ,,
Solution C	10 ,, .

It is well to begin development with an old solution, and to replace it by a fresh one as soon as the high lights have been brought out.

THE PHOSPHORESCENCE OF LITHIUM COMPOUNDS *IN VACUO*.

BY E. E. BROOKS.

Having noticed the great brilliancy with which certain lithium compounds phosphoresce when examined by Mr. Crookes's method in the negative discharge *in vacuo*, it may be of some interest to state the results obtained.

Lithium sulphate gave a bright lilac-blue glow.

Lithium phosphate was equally brilliant, the colour being a light Cambridge blue.

Lithium Chloride.—Pale lavender-blue; only moderate brilliancy.

Lithium Fluoride.—Very light flesh-coloured glow, about equal to the chloride in brilliancy.

Lithium Silico-fluoride.—Deep blue, with darker spots, but not so brilliant as the somewhat similar phosphorescence of the sulphate.

Lithium phosphate fused with sodium carbonate gave a bright emerald-green glow, which existed unchanged for a second or two after circuit was broken, and then faded quickly away. The other salts above-mentioned appeared to have no residual glow.

The nitrate, carbonate, and hydrate did not show any signs of phosphorescence.

Some lithium nitrate was fused and partly volatilised *in vacuo*, and the glass in contact with the fused salt received an opaque, enamel-like coating, apparently unaffected by water or acids; and, when the tube was again exhausted, this white coating exhibited a distinct phosphorescence, similar to, but more yellowish than, the normal phosphorescence of the German glass tube.

Of the lithium minerals, I believe spodumene is the only one mentioned by Mr. Crookes. This gives a golden yellow glow.

Lepidolite phosphoresces with very great brilliancy. The colour is a deep red, with traces of blue.

Petalite is also exceptionally brilliant, glowing with a rich yellow, like a live coal.

The spectra of all the above salts and minerals are continuous, only showing a concentration of light in certain parts of the spectrum.

Rubellite and indicollite did not phosphoresce, and amblygonite gave only slight traces of a whitish glow.—*The Chemical News.*

PHOTOGRAPHY IN RUSSIA.

BY C. T. CHESTERMAN.

PHOTOGRAPHY IN THE IMPERIAL THEATRE AT ST. PETERSBURGH—THE IMPERIAL RUSSIAN TECHNICAL SOCIETY—THE NEXT EXHIBITION IN ST. PETERSBURGH—THE NEXT INTERNATIONAL PHOTOGRAPHIC CONFERENCE AT BRUSSELS—DOUBLE GLASS STUDIOS—THE CHOICE OF PHOTOGRAPHIC LENSES.

A PHOTOGRAPHIC studio has been erected on the premises of the Imperial Marian Theatre in St. Petersburgh, and will shortly be opened.

Up to the present time Mons. Bergamasco has had the exclusive privilege of photographing the *artistes* of the Imperial theatres in costumes belonging to the Crown; now it is the intention of the Imperial Theatrical Direction to take these photographs, as well as scenic views, costumes, and theatrical accessories, and to publish copies of them for the benefit of provincial lessees.

According to the *St. Petersburgh Listok*, the studio and suite of rooms in connection therewith are superbly furnished, and the sum of 15,000 rbls. annually has been assigned for carrying out the plans of the Direction. Nevertheless, it will be some time before such an expert photographer as Mons. Bergamasco will be found to fill the post of Imperial Theatrical Photographer. There is a certain amount of skilled routine necessary to be able to turn out pictures such as the establishment of the above photographer has done for over a quarter of a century.

The Marian Theatre has a complete electric light installation, and some scenes have already been successfully photographed there by Mr. A. Smiruoff, the superintending electrical engineer of the theatre.

The V Section of the Imperial Russian Technical Society has elected His Excellency M. M. Deschevoff, president, and Mr. Leon Levitsky, Jun., vice-president of the Society. The members of council for the ensuing year are: Messrs. V. Gratschoff, N. Indoutny, J. Kovalsky, B. Kourdumoff, A. Lavroff, P. Olkhin, G. Schulz, A. Smirnoff, V. Tressnefsky, S. Vroblevsky, and C. T. Chesterman. Acting secretary, Mr. L. Zverintzoff.

It is proposed to give the next exhibition a scientific-educational character; there are hundreds who are at a loss to distinguish between one process and another. It will be the aim of the committee to arrange systematic collections of apparatus and appurtenances to illustrate the various branches of the art, and at stated times competent persons will explain these to the visitors. Besides the above, there will be the ordinary exhibition of photographs and novelties.

The Society proposes to send a delegate to the International Congress, to be held at Brussels in 1891. Here in St. Petersburgh, where all the houses are furnished with double doors and windows, your proposition of a glass studio within a glass jacket is rather the rule than an exception. In severe weather the moisture between the glasses freezes on to the outer panes unless all crevices be closed up round the inner frame. A space of 8 inches is sufficient between the frames; care should, however, be taken to putty the parts where the panes overlap each other in the roof. Inattention to this would soon make itself evident, as the soot of a town atmosphere would find its way through, and, settling upon the under frame, cause a disagreeable state of affairs.

A Russian newspaper, commenting upon the mineral riches of the Ural Mountains, states that platinum is found in no other part of the globe (?) From 1827 to 1845 coins of platinum were struck here, and upon these being withdrawn from circulation the price of the metal fell rapidly; fifteen years ago it was not more than 200 to 500 rbls. per pood, or about 17s. to 44s. per pound, so that its exploration fell rapidly. The present increased demand for it for technical purposes should create a larger supply. In reality, however, there are only 300 poods extracted annually in the Ural, and that is disposed of at the low figure of £13 per pound to agents of an English firm who are engaged to collect the metal in Ekaterinburg. There is a large amount of platinum along the River Ecsou, near the Katschkanar Mountains, where no notice is taken of the alluvial soil containing less than 8 ounces of metal per hundred tons of *dèbris*.

A translation of Mr. Dallmeyer's pamphlet, "On the Choice and Use of Photographic Lenses," has lately been published here by a Mr. Karpoff.

THE Photographic Society is advertising for an assistant secretary.

MR. S. W. GARDINER sends us a reproduced copy, on bromide paper, from a small negative of the large poster announcing the exhibition of the South London Photographic Society, to be held to-day and to-morrow in Hanover Hall, Hanover Park, Peckham.

REDUCTION OF SILVER NITRATE BY OIL OF BITTER ALMONDS.—E. Le Noble.—This reduction takes place under a variety of conditions. The author concludes that benzoyl hydride behaves like the aldehyds, reducing silver oxide, and passing to the state of benzoic acid.—*Journal de Pharmacie et de Chimie.*

PHOTOGRAPHY AND PAINTING.—The more one looks at exhibitions of photographs, the higher becomes one's estimate of painters. For securing portraits of one's friends photography is a fairly adequate and remarkably cheap expedient, and as such is a boon to humanity, though it usually fails in cases where the features of the sitter are very marked or characteristic, as it almost always exaggerates the special character. But look at the composed groups under different titles in the Exhibition of the Photographic Society (now open at the Society of Water-Colours rooms); at the rustic pair reading at their cottage door, for instance, under the title "In the Evening there is Light." This is intended for an idyllic picture such as we frequently find in the Society's galleries in water-colour time; but look at the hopeless vulgarity and inexpressiveness of this old couple set to pose for an idyll. That is realistic art, of which the camera is the true exponent; and what is it worth? A painter would have taken the same two figures, perhaps, just as models for costume and position, but would have put the light of feeling and sentiment into the faces; not such as could not exist in nature, but such as we do not find in the average man and woman, which is the material photography has mostly to deal with. There are various other scenes in which real figures play a part, but they all point the same moral. Take the absolute realism of ordinary men and women, and there is little to make a picture of; it is the artist who makes the picture; the living figures are only the raw material. Landscape is equally a failure in pure photography. Look at the two large Goupil-gravures exhibited by Messrs. Boussod, Valadon, and Co.; they are worth more as pictures than any of the pure photographs. There is one branch of work only in which photography has a value beyond that of any other process, viz., in the representation of architecture, and it is just this which is neglected. There are hardly more than half-a-dozen architectural subjects in the whole collection. The photographs of racing yachts are interesting, as recording the actual movement of the vessels and set of the sails. The photographs of clouds are interesting and valuable. But the bulk of the Exhibition strikes those who are accustomed to go to that room to look at pictures, as an illustration of what photography cannot do. It can *not* produce landscapes, and it can *not* make figure pictures. It only gives the prose of human life; we have to go to the artist for the poetry.—*The Builder.*

Notes.

A Camera Club is about to be established in Brussels, on the same lines as those laid down in other of the European capitals. It will be furnished:—1. With a luxurious studio, and the apparatus necessary for artistic photography, enlarging, and lantern projections. 2. Well-fitted laboratories, replete with every convenience. 3. A library and reading-room, containing photographic and artistic books and journals, a reception room, an exhibition room, and a "bodega." It will be established in the centre of Brussels, and foreigners as well as Belgians may become members. M. Cremers, of Rue de l'Ecuyer 31, Brussels, is working actively in this matter.

Rapid collodion dry plates are matters of interest to photographers, and, as already announced, Herr Gaedicke, of Berlin, has been trying to solve the problem of making collodion dry plates as rapid as gelatine dark plates. Recently he stated to the Society of Amateur Photographers at Berlin that he had succeeded in making them so as to equal in rapidity average gelatine plates, that they are unchanged by keeping for six months, that they may be developed six or eight weeks after exposure, and that the film is thin and rich in silver. The development is effected in an old quinol bath to which one-tenth its volume of a new quinol bath has been added. The plate is soaked in water for one minute, then is submitted to the action of the developer; the image appears in from eight to fifteen seconds, according to the length of exposure, and in one or two minutes the development is complete. About one minute's immersion in the hyposulphite of soda bath is stated to be sufficient for fixing; it is next washed for five minutes, dried, and varnished. He states that it is difficult to over-expose these plates.

M. Jules Breton has been trying experiments, as others have done before him, with hydrosulphite of soda as a developer; the usual way of making it is to add zinc filings to bisulphite of soda, but it oxidises so rapidly that, practically speaking, it must be used at once. He therefore prefers to produce the hydrosulphite directly in the bath, at the bottom of which he places a plate of zinc, and he surrounds the gelatine plate with a band of the same metal; then he pours upon the whole the solution of bisulphite of soda. The solution must be sufficiently weak to prevent any precipitation of the double sulphite of sodium and zinc, which is also formed by the reaction; he says that if any such precipitate be thrown down on the plate, it is easily washed off by water. Sulphurous acid may be used in place of bisulphite of soda, but its smell is suffocating. When the development is normal the images are of a fine black colour; when the development is too prolonged the images have a yellow tinge, which can partly be removed by means of an alum bath.

The season is now upon us when, in British large towns, the smoke and fog demons may be expected to do their worst. It is a strange thing that the British should be so careful about the drainage of towns and the cleansing of the streets, yet let more filthy air pass down their throats and into their lungs than, perhaps, any other people in Europe. Public buildings are blackened by the dirty air, and the photographic industry is impeded by the same influence. Leeds is often concealed from the vulgar gaze of those approaching it by its mantle of smoke. Cannot all the bright intellects in the Yorkshire College of Science do something to chase the smoke demon out of this country, as St. Patrick drove the snakes out of Ireland?

The Stereoscopic Company is "running" somewhat an innovation in connection with photography and electricity by way of advertisement. In the front of its new premises in Regent Street is a sheet of ground glass, measuring about eight feet by seven feet. This, during the daytime, forms a handsome window, prettily draped, and in the evening is a brilliantly illuminated lantern screen, on which are exhibited pictures of the most popular people of the day. The lantern itself is the outcome of a considerable number of troublesome experiments; it is fitted with most delicate adjustments, and gives a light of 6,000 candles. An assistant can switch on the current at will, and pass the slides through night after night. This form of advertising may do a business house a great amount of good; it certainly tends to popularise public characters. Each slide is properly titled, so that should some of the passers-by not be familiar with the face of the latest beauty, or the most popular man, they are at once informed by the name underneath. Possibly we may hereafter give an illustrated description of the lantern.

The phenomenon known as phosphorescence is one of those scientific puzzles which remain unsolved. Theories have been formulated, but no one has yet satisfactorily explained why light without any apparent heat should be so common in nature. The glow-worm, which has furnished poets with many a pretty simile, shines in our hedgerows as brightly as ever it did, but why it shines, and where it gets its luminosity from, no one has yet told us, although many naturalists have done their best to solve the problem. The luminosity of the sea has been traced to a minute organism called the *Notiluca Miliaris*, but there our knowledge stops, and we know no more about the cause of the beautiful light than we do about the secret of the glow-worm. So it is with other phosphorescent things in the animal, vegetable, and mineral divisions of nature; we know very little about them, although it is easy enough to produce a chemical compound which will exhibit the same curious property; and, as our readers well know, such a compound has been introduced commercially of late years under the name of Balmain's luminous paint.

But all chemical preparations of a phosphorescent quality, from the famous Bologna Stone discovered three hundred years ago, to the so-called luminous paint of to-day, sink into nothingness when compared with the brilliant light emitted by the *elateridæ* or fireflies of the West Indies, which are there used for lighting up rooms, and occasionally in lieu of diamonds in ladies' head-dresses. The light given by these creatures is evidently far greater than that emitted by any organism in this country, and it is not strange that they should have been chosen as representative insects of their class for certain investigations which have lately been conducted by Professor Langley and Mr. Verey at the Allegheny Observatory, Pennsylvania.

These investigators, by means of delicate apparatus, have succeeded in measuring the amount of light given out by the firefly of Cuba (*Pyrophorus Notilueus*). This insect is about an inch and a-half long by half an inch in breadth, and it possesses three light reservoirs, two in the thorax and one in the abdomen. These enquirers have calculated that to produce the amount of light emitted naturally by the firefly—that is to say, to get its equivalent by artificial processes—a temperature of 2,000° Fahr. would have to be employed. They have further calculated that nature, in the case of this insect, produces the cheapest light at about 1-400th part of the cost of the energy which is expended in a candle-flame.

Photographers are interested more than ordinary mortals in the question of light, both natural and artificial, and many of them will be wondering, in common with other thoughtful members of the human family, whether the secret of this marvellous source of natural illumination is really beyond the power of science to unravel. Is this light so wedded to vital processes that such a discovery would be equal to mastering the secret of life itself? We think not, because, as we have already pointed out, phosphorescence is present as a result of certain chemical combinations. It is, therefore, not too much to hope that some day the real source of this wonderful flame which burns—if it may be said to burn—with the expenditure of such a trifling amount of energy may be discovered. When that day comes, both the gas companies and the electric light corporations will find their shares at a considerable discount.

The fallacy of Professor Herkomer's dictum, that photographs were useless as representing the sitter as he or she really is, is clearly disproved by examples taken from the works of artists. There is Frank Holl's portrait of Sir Herbert Stewart, for instance. This picture was painted from a photograph, and the result was so striking a likeness that when the picture was first seen in the mess-room, some of the brother officers of the deceased soldier declined to credit the circumstances under which it had been produced. In this year's Academy there was a portrait of a lady by Mr. F. Goodall, R.A.; this was also painted from a photograph, and was considered a most extraordinarily able performance. Another photographic painting was his portrait of Sir Moses Montefiore, on seeing which his friend Dr. Adler exclaimed with astonishment, "It is Sir Moses himself, *wie er liebt und lebt.*" It is needless to say that in all these instances the painter had never seen the original.

The photographer is an indispensable adjunct at almost every function. His services, we note, are especially called into requisition when any patent to be afterwards exploited by means of a limited company is shown. It looks well, we suppose, to be able to produce a picture in which the representatives of the press are pictured in great numbers. The latest instance of this kind of thing was seen at the exhibition of a patent dredging machine at one of the south coast watering places. Two photographs of the guests were taken as they sat at luncheon, but as the exposure was at least one minute, and as the photograph occupied the place of a grace, we have some doubts as to the perfection of the result—a minute to hungry men is a long time. The time may come when some sturdy person of great strength of character will resist this enforced ceremony. He may say that he does not desire to be photographed, and, instead of sitting still, will commence to ply his knife and fork.

The hat-camera, which has been referred to from time to time as one of the curiosities of photography, is, according to the *New York Evening Sun*, of very ancient date. The credit is given to a Parisian who made a small camera which he concealed in his head-covering. A shutter in front was cleverly arranged so that the joint could not be seen. At first he used wet plates, but he soon saw the disadvantages he was labouring under. About the time the lightning photos were put upon the market the Frenchman's hopes rose high; he could take his hat anywhere with him, and no one at a glance would suspect its double purpose. Placed on a table facing the person to be taken, the little button at the back could be pressed and the exposure made. In some respects the hat-camera was immeasurably superior to the toys now in the market. A characteristic of photography is that no sooner does somebody discover a novelty than somebody else discovers that the novelty is very old, and that the germ was suggested five-and-twenty, or thirty, or more years ago. Probably the first instantograph which obtained a picture without the knowledge of the sitter was Skaife's pistolgraph, a quarter of a century ago largely advertised as the best apparatus with which to take babies.

This may fairly claim to be one of the eccentricities in the way of photographers' advertisements. It is from a show-card in a shop window in the Boulevard Sebastopol, Paris, and runs as follows:—"If you will picture have after photographs, you can yourself for five francs taken have, and your wife for three francs painted have with oils all over."

THE REPRODUCTION OF POSITIVES AND NEGATIVES.*

BY ERNEST J. HUMPHERY, M.A.

BEFORE I enter upon the principal subject of my paper, I should like to show you a few of the results of methods of reproduction which are not very frequently used, but are well worth very careful study.

The first is a transparency on platinotype paper, made in the ordinary way by contact, the print being fully printed, and then rather over-developed in order to sink the image, after which the paper is rendered more transparent by the aid of paraffin, which, amongst its other qualities, has the very valuable property of not turning yellow with age. You will notice, in looking at this transparency, that when looked at by reflected light it appears dull and flat, but when held up to a strong light it is as transparent and almost as brilliant as a transparency on glass.

And now I come to the main point of my paper, viz., the reproduction of positives direct from positives, and negatives from negatives. The process is so simple and so fascinating that I trust you will all give it a trial, and that in the hands of some of you who have more leisure than I have, experiments may be carried out which will give you a perfect mastery over the methods of development necessary to obtain the best possible results.

I do not propose to go into the theory of the subject, as that has been so ably discussed already by Captain Abney and others; but merely to give you the practical results of my experiments with varying exposures and different developers.

The method which I have used is this. The negative, in contact with a sensitive plate, is exposed in the printing frame to diffused daylight for a few seconds, and then developed with a very weak developer.

The developers which I have used are eikonogen, hydrokinone, and pyro and soda.

The first negative which I wish to show you is of more than common interest, inasmuch as in the original negative the central figure was seated on a common Windsor or kitchen chair, in a room containing, as far as my memory serves me, a kitchen clock and two other wooden chairs. The whole of the background was very skilfully worked out. I think you will allow that the present surroundings of heather, rock, mountain, lake, and sky make the picture rather more pleasing than the somewhat incongruous furniture of the original. To obtain the reversed negative, which I will hand round for your inspection, the negative was placed in the printing frame in contact with an Ilford ordinary plate, and given twelve seconds' exposure to diffused daylight at 3.45 p.m. on Saturday last, when, as you will remember, the light was rather poor.

The developer used was eikonogen, Marion's instantaneous.

Formula
- 5 parts sodium sulphite
- 2 parts carbonate of potassium
- 1 part eikonogen
- 30 parts water

Diluted with eight times its bulk of water.

Development takes place in the ordinary way, except that, instead of a positive, a negative image gradually appears, and continues until development is complete, which, in this case, was about fourteen minutes.

* From *The Journal of the Camera Club.*

The second plate from the same negative had twenty-five seconds' exposure to diffused daylight at 4.7 p.m. on the same day; and in this case development was continued for sixteen minutes.

The third plate was given an exposure of twenty-five seconds at 4.45 p.m. of the same day, but in this case hydroquinone was used; I cannot give you the exact constituents of this developer, but it is known by the truly scientific name of hintoquinone, mixed in the following proportions:—Hintoquinone, 1½ drams; water, 8 oz. Time of development, thirty-five minutes.

It will be interesting to compare this with the eikonogen developed negative.

The fourth plate is a transparency, produced in exactly the same manner as the former, but from a paper transparency. I will hand round the transparency and the reproduction in order that you may compare them. This was given a two minutes' exposure at 5 p.m., when the light was, of course, very feeble; developed in eikonogen in the same proportions as before, and development was continued for twenty-five minutes.

The fifth, negative of bridge and trees, 20 seconds' exposure at 4.20, light dull.

Developer, eikonogen, 1 in 8.

Time of development, 15 minutes.

The sixth, exposure 8 seconds, 12.30 p.m., light good.

Developer, 60 minims S.P.

20 grs. carbonate of soda
40 grs. sulphite
8 oz. water

Development, 10 minutes.

This seems to give very good results. There is good detail in the high lights, and, perhaps, better gradation throughout.

The seventh, exposure 2 seconds, 12.55.

Developer same as No. 6, but with the addition of 2 oz. water.

Exposure is evidently insufficient. The high lights in the negative partake evidently of both the positive and negative image. The shadows show plenty of detail, as the exposure for shadows was probably about correct.

The eighth exposure was made in a different manner; the first object being to avoid halation, the second to delight the "new sort of lunatics" who believe in the destruction of detail. The plates were placed in the printing-frame back to back. In this case it will be noticed that the evil effects of halation are greatly diminished, and the gradation appears to me much better than in the other examples I have shown.

This leads me very strongly to the opinion that far better results than I have shown would be produced by backing the plates, or by the use of films.

In the quarter-plate reproduction, which I now pass round, I would particularly draw your attention to the margin; this, although entirely protected from light by the rebate of the printing-frame, is black. If you compare this margin with that of the transparency, you will notice that whereas the margin of the negative, which was exposed to no direct light, is black, the margin of the transparency, which was fully exposed to the direct light without any protection, is simply slightly fogged.

Unfortunately, my time for experimenting has been so short that I have not been able to try the effect of backing the plates to prevent halation; but I am inclined to think that this would be very advantageous. Probably, also,

films would give very satisfactory results; but these will have to be the subject of further experiment.

I am at the present moment experimenting with a view to producing enlargements direct from the negatives, but at present have not carried them far enough to obtain perfect results from them. If, however, I succeed, as I hope to do, the advantage of this method of producing enlarged negatives is so great, that it will probably be found to be the most important branch of the subject.

A COLLISION BETWEEN A PHOTOGRAPHER AND A COUGAR.

From a long narrative in *The Detroit Free Press*, we learn that the other morning, in the city of Seattle, the people in the vicinity of Sixth and Pike Streets turned out and joined in the excitement of a genuine hunt after a cougar.

About nine o'clock, as Judge Wood was crossing the vacant lot on the north side of Pine Street, he noticed an immense mountain lion trotting along leisurely across the lot. He watched it as it disappeared in the Kentucky stables.

The appearance of the wild beast caused a big commotion among the horses. The uproar brought one of the men down; he saw the lion quietly taking in the situation. He hurried upstairs, and caused a stampede with his report. Mr. Bishop, owner of the stables, hurried to get his rifle, while the men cautiously took a look at the brute. He was trying to catch a chicken which was in the stable, and succeeded in killing one. He soon found out that the men were watching him, and he made a dive through the window. Mr. Bishop came up just as the animal sprang, and he fired a shot at him, catching him in the hips as they disappeared through the window.

The lion gave a howl of pain, and leaped to the sidewalk, ten feet above, and started down Sixth Street towards Pike on a dead run, screeching and yelping. Pedestrians scattered in every direction, and gave the beast a clear track.

Mr. Munsen, the photographer, was out in the street adjusting his camera preparatory to taking a view of the power house. He had the cloth over his head, and was deeply interested in his work, when the cougar came flying along and ran square into the photographer from behind, turning him and his camera over in a succession of confused revolutions. The cougar righted himself and trotted away, gazing at the astonished photographer as he sat amid the wreck of his apparatus.

On reaching Pine Street, the cougar jumped the fence into Dr. A. P. Cole's yard, and crouched down on the ground. Several children were on the porch, but were too frightened to move. The lion made a spring for them, but was weak from loss of blood, and fell short.

At this point Eugene Chapin rushed out from his store flourishing a big 44 six-shooter, and opened up a brisk cannonade upon the crouching cougar. A good shot from the revolver dropped him as he sprang from the ground.

The dead animal weighed 160 pounds. It probably wandered in from the timber sometime in the night, and could not find its way out in daylight.

The London and Provincial Photographic Association.—November 27th, demonstration of Messrs. Varley and Greene's Magazine Camera, also paper by Mr. Friese Greene; December 4th, "The Primuline Process," demonstration by Messrs. Green, Cross, and Bevan; December 11th, lantern night.

THE ARC LIGHT FOR PROJECTION.*

BY DR. L. H. LAUDY.

A general adoption of the electric arc light for purposes of projection is not far distant, and, having devoted some time to the subject, following it up from the days in which the current was produced from batteries until to-day, when we have on tap a current of electricity as we have gas or water supplies, it seems most fitting that my experience should be given to the members of this Society, and my object in inviting you here this evening is to give you some experimental facts, and ask your verdict as to their application for lantern projections.

Our usual method has been to make use of incandescent lime. This was a great advance from the oil lamp, and to-night we take probably the last step in this direction of improved illumination, and make use of the most intense artificial light known to science.

Artificial light is generally produced by raising some body to a high temperature. If the temperature of the body be greater than that of the surrounding atmosphere, it parts with some of its energy in the form of radiation, and at a high temperature this radiation becomes sensible to the eye, passing from red, yellow, green, to blue and violet. At the present time, for all artificial illumination the radiant body is some form of carbon, either incandescent or combining with the oxygen of the air.

The electric light is the outgrowth of the experiments of Sir Humphry Davy, made at the Royal Institution, London, in 1801, when he used 2,000 cells, with which he decomposed Na and K, and separated their metallic bases. These experiments were repeated and extended, and by using charcoal points as terminals an intense and dazzling light was produced, to which the name voltaic arc was given. Foucault used a more dense form of carbon for his newly-invented lamp or regulator, producing a more steady and uniform light.

The arc light, when produced from a battery, brilliant as it is, was confined to the lecture-room or an occasional outdoor display. The fatal difficulty was the labour and cost of the electrical energy, and it was not until the discovery of induced currents by Faraday that this obstacle was removed.

It was many years before any practical application was made of this most important electrical discovery, and it required the combined forces of Nollett, Von Maldern, Holmes, Wilde, Ladd, and Siemens to produce by mechanical means, direct from motion, a supply of electrical energy that would equal that produced from the battery. Even as late as 1870 this did not seem possible, for the best dynamos at that time yielded only a small amount of electrical energy.

In 1871 Gramme presented to the Academy of Science a description of a new form of magneto-electric machine possessing new features, which were so remarkable as to astonish all the world. Gramme conceived the idea of using a ring, and rotating this between the poles of a magnet in such a way as to prevent reversals in the armature. Many ridiculed this idea; nevertheless, it produced in practice a machine which yielded large currents at much less cost, and laid the foundation of our present system of electric lighting.

From whatever source the electricity is supplied to produce light, it is necessary that the current meets with a resistance, and this condition is best fulfilled when two

* Read before the American Society of Amateur Photographers.

pieces of carbon are made to touch and are then slightly separated. The current, in passing between the space, so increases the resistance as to produce light of great intensity, and is called the arc light.

That a constant resistance may be maintained favourable to the production of light, some mechanical device which will separate and regulate the distance of the carbons is essential. Such an apparatus is called a regulator or arc lamp. There are few inventions on which so much ingenuity has been expended as on arc lamps. The number is already very great and is on the increase, and every bulletin of the patent office is sure to contain several inventions of this kind.

Between the better lamps there is not much to choose for ordinary illumination, but for special purposes, as in the case of lantern projection, some points are of vital importance, for the success will depend mainly upon the steadiness, good behaviour, and the excellence of the automatic feed, quality and position of the carbons, together with a uniform action of the dynamos.

At present arc lights are run both by continuous and by alternating currents, *i.e.*, in some cases the current is steadily in the same direction, while in others the current consists of pulses, alternately positive and negative, succeeding each other at the rate of from 200 to 300 per second.

The first lamp for regulating the position of the carbons was devised by Thomas Wright, of London, in 1845. A few years later Le Molt, of France, devised a clock-work regulator which kept the light steady for several minutes at a time, but the flickering was too great to make it of any practical value. These were followed by Archereau, Lacassagre, and Garlfe, each lamp an improvement on the other, which brought the standard of regulators near to practical application.

In 1849 Foucault devised a clock-work regulator which differed in many details from the ones before used, and gave comparative satisfaction. It was extensively employed for scientific purposes, and, in fact, was the only lamp that was suitable for lantern projection, and is today used in many physical laboratories in preference to other lamps.

The next advance was by Serrin, whose regulator kept the carbons exceedingly steady, and maintained them in their relative positions. This lamp has been used for light-house illumination, and still maintains that position, for, like the Foucault, it is a focussing lamp, the function of which is to maintain the carbons at a central point. To produce this effect the carbons are so arranged that a different motion is imparted to each, that the wearing away may be compensated by a more rapid movement of the positive pole with only a gradual waste of the negative carbon. By this simultaneous approach of both carbons, the positive moving through double the distance of the negative, the arc preserves its normal length, and its position is maintained in space. This is accomplished by an ingenious mechanical device, actuated either by clock-work or electric magnets.

The regulation of the length of arc that shall produce the most intense light with the least current is confined to very narrow limits, and the mechanical construction of the lamp which will yield satisfactory results must be most perfect. In many of the lamps this regulation is still wanting, and lamps lacking the above essentials, which are put together without regard to any electrical laws, with the hope that chance may make them work, produce a hissing and hammering noise that is disagreeable when silence is required, and are not to be recommended for any purpose.

However good the regulation, due to the electrical and mechanical part of the lamp, they cannot regulate the minute accidental variations in the structure of the carbons, which cause a shifting of the arc or chasing, and as the arc flies around, the direction of maximum emission will change with it. These fluctuations produce immense variations in the intensity of the light, changing back and forth from 400 to 2,000 candles. Great improvements have been effected in the homogeneity of the carbons, and the time is not far distant when the flickering will be entirely removed.

The mechanical and electrical regulating devices are all that could be desired, and at present the light is not too irregular to be adopted for purposes of projection. With any good regulation, results may be obtained that far exceed in brilliancy any of the old methods employed. This matter of increased intensity is of great importance, especially in large public halls, where in many cases the picture is enlarged many hundred times, without regard to the diminished light produced by means of the oxyhydrogen light.

In considering the application of the electric light as a source of illumination, it is very important to notice just what position the carbon poles must occupy in relation to certain requirements.

For outdoor illumination the axes should coincide, that the crater formed in the upper carbon may act as a reflector, and thus produce an increased downward illumination. Advantage is taken of the crater-like reflection to cast the rays at variable angles in a given direction.

To obtain the best effects for lantern projections, the carbons are arranged that the axis of the upper carbon coincides with the edge of the lower carbon farthest from the condenser. In this position of the carbons the light will be concentrated upon one side and radiate freely in front, and will be cut off from behind, with little escape at either side. From this it follows that many different results can be obtained, depending upon the position of the carbon.

It is more or less difficult to make a classification of arc lamps in their present state, or divide them into a few distinctive types. The old classification divided them into monophotal and polyphotal. In the former the electro-magnet system, which produces the adjustment of the distance of the carbons, is traversed by the main current and is adjusted for a constant current. This prevents a number of lamps being placed in series, as the approach of the carbons is produced by mechanical means independent of the current. Polyphotal lamps are adjusted for a constant resistance of the arc. This is effected by placing the regulating apparatus in a shunt of the main current, which is also supplied with a cut-out device to short-circuit the lamp in the event of a disconnection in the arc. The objection to this classification is that one would be transferred to the other by an alternation in the winding of the coils. The better or later division is to class them either as series or parallel, which is dependent upon electrical conditions rather than mechanical. We may again subdivide them as a matter of convenience into : 1, hand regulation ; 2, actuated by a spring (clock-work) ; 3, train of wheels and gravity ; 4, differential and gravity ; 5, clutch and dash pot ; 6, electro

motor; 7, focusing; 8, electro magnet and dash pot; 9, lever movement.

The most important consideration is simplicity of construction and sensitive motion of carbons, with speed to allow of instantaneous adjustment. These conditions are changing at each variation of resistance, which alters with the change of temperature in the conductor, and this again varies the potential, so that it is impossible to keep the arc constant. For any increase in the current the wire coils are heated with an increase of resistance in the lamp. To regulate these variations, and to secure the proper proportions, we meet with colliding difficulties, and are confined to narrow limits in order to reconcile them. The necessary features in construction of a lamp are: 1, striking mechanism or separating the carbons; 2, feeding; 3, replacing, to put in new carbons (trimming); 4, moderating, to prevent carbons striking or hammering; 5, change over for two carbons; 6, cut-out; 7, clamps for carbons; 8, driving power, which may be clock-work, gravity, weights, electro magnets, and electro motors.—*The American Amateur Photographer.*

Patent Intelligence.

Specifications Published.

16,778. *October 24th*, 1889.—"Photographic Cameras." Samuel Dunsieth McKellen, 3, Chapman Street, Manchester, Photographic Apparatus Manufacturer.

The first part of the invention has for its object an easy means of carrying any convenient number of plates in one storage box, so that they may be exposed one after another, and an easy means of transferring the exposed plate from its position in the storage box into a separate receptacle.

A chamber or magazine is provided at that end of the camera which is opposite to the lens. This chamber is made to contain any convenient number of plates, preferably one or two dozens, which are placed therein face to back, the sensitive films being towards the lens. The plates are pressed forward against a frame (afterwards to be described) by suitable springs, which exert sufficient pressure at the back of the plates to ensure that the front one shall be always kept in proper register. The transferring of the front plate, after exposure to the receiver, may be effected in the manner described in detail in the patent.

"The second part of my invention is to provide a cover for cameras of all kinds which have to be carried about. This cover is intended to dispense with the use of a carrying case. For this purpose I employ any material of which camera cases are usually made. I cover the base-board of the camera with the material attaching it by means of studs placed in a convenient position, or by any convenient means. I make an opening in the centre of the material corresponding in size to the turn-table in my cameras, or large enough to allow a triangle to be screwed to the base-board, or with only a small hole through which a base-board screw may pass. I make this material of such size and shape that it will fold over and cover all of the camera when it is folded up. It can then be fastened by buckles, or in any convenient way, so as to appear as if the camera were in a case. The advantage of this cover is that the camera can be mounted on its legs, and, the cover being unfastened, the camera can be opened, leaving the cover still attached to the base-board. The camera, cover, and legs attached, can thus be carried about, when photographing, from one point of view to another much more easily, as there is no empty camera case to handle.

"The cover may be attached to the under side of the camera if preferred, but the action is the same. A handle may be fixed to the cover, or the handle of the camera itself may be used by having an opening in the material through which it projects to allow of its being grasped by the hand. If the cover is attached to the under side of the camera, the base-board apertures may be omitted, and in that case the cover would be unfastened before placing the camera on the legs."

The inventor claims:—

1. The use of sheaths or frames with side projections for the purpose described.

2. The method of removing the front exposed plate from its position by sliding the containing sheath or frame along the rails till the projections pass through the notches in such rails as described.

3. The use of a receiver, which is caused to close up against the face of the magazine to enable the exposed plate to fall into it.

4. The use of gripping cushions or racks to firmly grip the sheaths when in the receiver.

5. The combined arrangement of magazine, sheaths with projections, receiver, and gripping racks for the purpose described.

6. The combined arrangement of magazine, sheaths, pinion, or shaft with catch, receiver, and gripping racks.

7. The use of a constantly attached cover with ordinary cameras to take the place of the usual carrying case.

17,548. *5th November*, 1889.—"Cameras." Francis Beauchamp, Hope Cottage, Chadwell Heath, Essex, Engineer.

This invention relates to a camera for photographic purposes, which may be used either on the tripod stand or for detective work, and is made to carry any suitable number of plates. The said camera is divided with partitions for the purpose of forming dark chambers; one chamber has a ground glass for focussing purposes; the plates are held up to an adjustable face by springs. Each plate is provided with a frame which has an arm attached—each arm has a hole in—which is threaded on to a rod or a piece of tube for the purpose of working thereon; each arm is provided with a notch which comes in contact with a push piece from the outside of the camera for the purpose of lifting the said frame, which holds the plate up or down for exposure, through a slot provided with a cover; the frame has a spring tension for clutching the plate firmly. The camera is so arranged that it can be drawn in or out by hand, or by a rack-and-pinion working in a tube which acts as a guide for focussing purposes. As the front of the camera for carrying the lens works telescopically by tubes working in each other, or springs at each corner of sufficient strength for supporting the covering, which may be of any suitable material for excluding the light in the movable part of the camera, I sometimes employ two chambers for the plates, one for the exposed plates, and one for the unexposed. The plates are held by a spring frame in the same manner as before described, but in this case the ground glass is not used, as it has a fixed focus, and a finder is required.

17,773. *November 7th*, 1889.—"Improvements in Photography." Ernest Howard Farmer, of the Polytechnic School of Photography, 309, Regent Street, London, Photographer.

The so-called chromium processes in photography are based upon the property possessed by light of decomposing bichromates and other reducible compounds in the presence of gelatine or other colloid substance; whereby in the gelatine (or other colloid) are induced both chemical and physical changes—chiefly that they are rendered insoluble in their usual solvents.

I have discovered that the like changes take place when bichromates, or chemically similar reagents, are brought into contact with silver surrounded by gelatine or other colloid; that is to say, more or less of the gelatine or other colloid is rendered insoluble in proportion to the quantity of silver present.

I prefer to proceed as follows:—I prepare dry gelatine films in all respects in the ordinary manner, except that I do not add any hardening material to the gelatine, as is sometimes done. I expose these films in the usual way, either in a camera or under a negative or positive, and if only an invisible image has been impressed the picture is developed also in the usual way—I prefer the iron developer. Then the plate or surface carrying the film with the silver image upon it is immersed in a strong solution of bichromate of ammonia, a suitable formula being—

Pure bichromate of ammonia ... ... 4 ounces
Water ... ... 20 ,,

The time of immersion may be one minute. The plate or surface is then washed and dried, when it becomes suitable for use in the various ways in which plates with exposed chromated films are now employed.

For example, the plate or surface may be used in the following well-known processes :—

1. The plate may be of copper and may be etched ; the etching fluid will act least where the plate is most protected by insoluble matter. A copper printing plate is thus obtained.

2. The plate or surface may be treated with hot water, and then used for printing by pouring a suitable ink on the surface, laying a paper thereon, and expelling the superfluous ink by pressure.

3. The plate or surface may be used direct for printing by rolling a greasy ink upon it ; the ink adheres to the insoluble parts, and is repelled by moisture which the unchanged parts retained ; the inked plate is then pressed against the paper to be printed.

4. The plate or surface may be charged with greasy ink, and after washing the image may be transferred to a lithographic stone or surface, which may then be used in printing in the well-known manner.

In the preparation of the plate, chemically similar reagents may be used in place of the bichromate of ammonia, and organic bodies similar to the gelatine (gum, starch, albumen, and the like) can be used in place of or in conjunction with it. The bichromate or similar reagent may be placed previously in the film or developer, and react on the gelatine at the same time as the developer sets free the metallic silver, but the method above described is preferred. It will be seen that in this process the chemical reducing properties of silver are employed, the silver image, acting with the aid of the bichromate, to render the gelatine film insoluble. In this process the metallic silver forming the image acts in the place of the light in causing chemical change in the film.

The inventor claims :—

1. The employment in photography, substantially as described, of the reducing powers of the silver image produced by light in rendering insoluble gelatine and like colloid films.

2. In the production of photographic pictures substantially as described, the process consisting in obtaining a photographic image on a sensitised gelatine or like film, exposing and developing the said image, whereby silver is liberated in the film, and further causing the film so treated to be acted upon by bichromate of ammonia or similar reagent, whereby the film is rendered insoluble more or less in different parts, and proportionally to the varying action of the light upon the sensitised film.

19,319. *December 2nd*, 1889.—"Reducing-Cameras for Lantern Slides." ARTHUR PEARSON, 5, New Station Street, Leeds, Yorkshire, Dealer in Photographic Instruments.

My invention has reference to reducing cameras for lantern slides, and consists,

1. In constructing the end of the camera (where the negative is placed) so that the said negative can be adjusted in its position either horizontally, vertically, or diagonally. To enable me to do this I preferably employ flat springs, one arranged at each corner of the camera, for the purpose of holding the negative in any required position, and when more or less of the picture is required to be exposed, the negative can readily be adjusted or moved from one position to another, which cannot be done with the present construction of camera ; consequently a long felt want is supplied. Instead of employing the flat springs for holding the negative, other equivalent devices may be substituted.

2. In the present construction of cameras, there is always some difficulty in getting access to the lens. To obviate this I divide the camera into two parts, connected together by a suitable form of slide, between which parts there is a space left, giving free access to the lens. The space left between the divided camera is covered over by the focussing cloth for the purpose of darkening the camera, rods or projections being employed to suspend the said focussing cloth. The reducing end of the camera is also lessened in size, and made to the size of plate to be used, the object being to economise room, reduce the cost, and make the camera more portable.

19,618. *December 6th*, 1889.—"Boxes for Changing Photographic Dry Plates." GEORGE BRAMLEY and GEORGE BUTTERWORTH, Clay Cross, Derbyshire, Foundry Manager and Foreman of Mechanics respectively.

The improvement is in the means adopted to ensure the delivery into the dark slide of a single plate.

The inventors claim :—

Constructing changing boxes with a reciprocating frame movable from the outside of box, and a particular combination therewith of a lever and latch, substantially as herein described.

5,860. *April 17th*, 1890.—"Photographic Cameras." HARRY RANSOM, 122, Newington Butts, London, Photographer.

This invention relates to improvements in photographic hand or detective cameras, whereby a number of plates may be successively exposed in a simple and convenient manner.

In carrying out my invention, I provide a rotating shaft or cylinder, to which is hinged a number of sheaths or holders in which the sensitive plates or films are placed. The cylinder is adapted to be rotated in a suitable case or box, and is advantageously formed with as many sides as there are plate-holders, say twelve, for example ; the sheaths or holders are flexibly hinged to the cylinder, and a suitable ratchet arrangement is provided to allow of the cylinder being rotated one-twelfth of a revolution, each movement bringing a plate in a proper upright position opposite the lens and against a flexible frame, which helps to retain the plate in a rigid position during exposure, but allows the sheath or holder with the plate to be passed through it when the cylinder is turned, whereupon the plate by its own weight falls down clear of the lens, bringing the next plate into position for exposure.

In practice, I find it advantageous to form my sheaths or holders so that they shall act as springs to clip the plate firmly, and to form them in parts adapted to slide one upon the other, so that they may be used for different sized plates. I employ a drop shutter with suitable arrangements for operating the same.

In some cases I adopt an auxiliary lens outside the case adjusted and working with the operating lens, whereby I am enabled to accurately focus the object to be photographed.

13,381. *August 26th*, 1890.—"A Photographic Posing Chair." JAMES MCKENZIE DOW, Ogdensburg, in the County of St. Lawrence, and State of New York, Photographer.

My invention relates to posing chairs, more especially adapted for photographers, although equally adaptable to other purposes, and it consists in part of the combination with a suitable seat, of a series of adjustable parts, rest supports, and braces, adapted for varied and independent adjustments for the head, back, arms, &c. ; also in the construction and arrangement of said head, back, and arm rests, combined with other parts, whereby an independent vertical and lateral adjustment may be had ; and thirdly, in the construction and combination of the several parts, whereby such chairs may be utilized with a greater degree of efficiency than when otherwise constructed.

The object of my invention is to provide such chairs with such parts and adjustments, that the subject to be operated upon may be posed more properly, and to the desire of the photographer or other person, posing, or being posed, than by any other means, and at the same time insure the greatest amount of comfort to the person posed.

8,647. *4th June*, 1890.—"Focussing Arrangement for Photographic Cameras." JAMES CHAPMAN SHENSTONE, 13, High Street, Colchester, Essex, Chemist.

My invention relates to a device for attaching a focussing cloth to a camera, and it has for its object attaching the cloth in such a manner that it may be easily attached to or removed from the camera, and it is so firmly attached as to need no control on the part of the operator.

I attain this object in the following manner :—I take an

ordinary focussing cloth, and on one edge I attach a clip designed to embrace the camera on the top and two sides, just in front of the back frame, or at any other conveuient poiut. The clip may be made in a variety of forms, and may either be made adjustable to fit a camera of any size, or it may be made non-adjustable to fit a camera of a given size.

The clip consists essentially of a bar, adapted to lie across the top of the camera, and of two spring arms or their equivalents at each end, adapted to embrace the sides of the camera.

In an adjustable clip the bar is made telescopic, or otherwise, so that its length may be varied either automatically by a spring or springs, in which case the arms at the ends may be rigid, or by meaus of any suitable locking arrangement, iu which case the arms at the euds would be formed as spriugs. In a non-adjustable clip I make the bar of one given leugth, and I attach the spring arms to the end of the said bar. In all cases I prefer to attach the arms to the bar by means of knuckle joiuts or their equivalents, so that they may be folded to lie against the bar, thus euabling the focussing cloth to be folded up into the smallest possible space.

Correspondence.

INSTRUCTIONS FOR USE OF OPTICAL LANTERNS.

Sir,—Numerous enquiries are made as to how to obtain the maximum amount of light from the lamps supplied with optical lanterns.

We venture to enclose advance proof of matter at present in the press on this subject, thinking you may consider the hints it contains useful to many of your readers.

Perken, Son, and Rayment.

Instructions.

Wipe the frout and condensing lenses with a piece of soft silk free froin every particle of dust.

Thoroughly dry the new wick before putting it into the lamp ; let the wick be saturated with oil before lighting.

The best paraffiu oil gives the brightest light ; Diener's A1 safety oil, and Strauge's A1 crystal oil, also the Vascline Co.'s Luxor, are specially recommended.

The best quality of wick is indispensable to brilliant illumination. Cheap wicks and cheap oils are false economies, answerable for very mauy failures and disappointments when exhibiting the lantern. A large and strong pair of scissors should be used to trim the wicks, or preferably the "Optimus" patent wick trimmer, as a perfectly straight and even edge to the cotton is necessary for the avoidance of an uneven flame aud smoke. Cut off the protruding corners to allow the flame to draw evenly upwards.

Light the lamp with wax vestas or tapers. The heads of matches or charred paper are liable to fall into the air passages between the wick tubes, so impeding complete combustion.

When lighting the lamp, do not turn the wicks high immediately, but raise them little by little at intervals of a few minutes. This system, besides improving the flame, gradually warms the condensing and front lenses ; if suddenly heated they are likely to crack. Cold air being allowed to blow on a heated condenser will also certainly cause unequal contraction, *i.e.*, a cracked glass.

The oil reservoir and other exterior parts of the lamp should be wiped *perfectly* dry, otherwise the oil about them will vapourise and fill the apartment with a most unpleasaut odour.

The wicks should be trimmed prior to each exhibition, aud when not burning should be turned one-eighth of au inch below the top of wick tubes, so that they may be permeated with oil.

A plentiful supply of pure air is an imperative necessity for perfect combustion or perfect illumination. In crowded rooms, opening a window or door will greatly improve the light of the lamp ; insufficieucy of air ensures a bad light and an unsatisfactory exhibition. Like ourselves, the lamp gives its best results when it enjoys pure air, clean surroundings, and pure food (oil).

LANTERN SLIDE MAKING.

Sir,—In your article on the above subject in last week's issue, yon say, "chloride plates are also unsuitable for copying work in the camera when a larger negative has to be reduced to lantern plate size." A paragraph or two above this you say, "the makers do not all state by which process their plates are prepared, but there is no difficulty iu distinguishing the chloride plate by its translucent film, and by the orange colour which it has by transmitted light."

Judged by this standard, as well as by the variety of tones obtaiuable, alpha lantern plates are undoubtedly chloride plates, and yet I have within the past three weeks produced several dozen lantern slides on them by daylight reductiou iu the camera from whole-plate negatives, using a RR. lens of 6 inch focus with *f*/11, and an average exposure of 60 seconds.

When I further tell you that an experienced (professional) lanteruist a few days since projected some of these on a disc 18 feet in diameter by limelight, and pronounced them equal to the best slides he had seen produced by the gelatine process, aud much better than the great majority, I think you will agree that it is time it was knowu that chloride plates are equally amenable with bromide ones to camera reduction or copyiug, a longer exposure merely being required.

Plymouth, November 18th. E. H. Micklewood.

PHOTOGRAPHS OF METEOROLOGICAL PHENOMENA.

Sir,—At the Leeds meeting of the British Associatiou, a committee consisting of Mr. G. J. Symons, F.R.S. (Chairman), Professor Raphael Meldola, F.R.S., Mr. John Hopkinson, and myself, was appointed to report npon the applicatiou of photography to the elucidation of meteorological phenomena, and to collect and register photographs of such phenomena. The success with which these instructions can be carried out necessarily depends iu a great measure upon the voluutary co-operation of others.

Will you, therefore, allow us to appeal to photographers through the medium of your columns, and to ask all who have in their possession negatives of clouds, lightning, hoar-frost, hailstones, or any other meteorological phenomena, or of damage done by whirlwinds, tornadoes, or storms, to communicate with me. We shall be grateful for copies of any such photographs, but shall especially welcome offers of future assistance in the shape of photographs taken in accordance with some simple instructions which will be supplied on application.

Arthur W. Clayden.

Warleigh, Tulse Hill Park, London, S.W., November 18th.

Photographic Society of Ireland.—At the technical meeting on November 27th, Mr. J. Carsou will give a demonstration of lautern work.

Herefordshire Photographic Society.—December 2nd, the subject of "Bromide Enlargements" will be opened by the Hon. Secretary.

Indexing Photographic Literature.—In these days of a rapidly iucreasing photographic literature, a systematised index is a necessity to him who wonld have his photographic store of knowledge within easy reach. It is not always easy to lay one's hand on this or that article which was casually glanced over the other day, but which to-day is just what one wants if he can only find it. Even the most modest photographic library is the better at command through an index. Some hiuts from one who is fortunate in the possession of a photographic library of over two hundred volumes, and to whom some thirty periodicals briug the photographic news of the day, may be of value. The first thing is to purchase a small blank book indexed from beginning to end. In this are entered the titles of all the leading articles in the periodicals as they come to hand, the chapter headings of all new books, and references to formulæ and wrinkles. When this book is full, its contents are transferred by subjects to a larger Index Rernm, where they form a condensed *resumé* of photographic matters. In this way the systematic and thorough study of auy subject is simplified, and anxious inquirers are referred to competent authorities.—*American Amateur Photographer.*

Proceedings of Societies.

The Camera Club.

On Thursday, November 13th last, at a meeting of the Camera Club, Capt. W. de W. Abney, president, occupied the chair.

Dr. C. S. Patterson exhibited a printing frame for transparencies, one of the features of which was that no light could get from the sides and pass under the edges of the plates to cause fog.

Mr. Bevan then gave a demonstration of the diazotype process of Messrs. Green, Cross, and Bevan. He gave various particulars, which have been previously published in these pages, and he stated it to be a curious fact that the diazotised primuline itself is almost inseusitive to light, even after exposure to daylight for several hours; only in contact with the matter of the fibre does it become sensitive, and the amount of sensitiveuess differs with the kiud of organic substance with which it is iu contact. On cotton or paper it is more sensitive than upou wool or silk; on cotton it is quicker than the blue ferro-prussiate process, and rather quicker, he thought, than ordinary ready-sensitised albumeuised paper. The sensitive compouud, placed under water and exposed to light, gives off bubbles of nitrogen gas, which can be collected in the usual way iu au inverted bell-jar or test-tube. When the colour of a diazotype print does not please, it can be recouverted into the sensitive substance by suitable treatment, and then be brought out of another colour by the application of a suitable developer. The inventors had exposed pieces of sensitised cloth under glasses of different colour, and under yellow glass, such as might be used in developing rooms, there was a powerful action. Through the kindness of Mr. Norman Lockyer they had been enabled to make spectrum exposures, and fouud the maximum place of actinic power to be different from those given by silver salts, aud apparently somewhere in the orange, but it was difficult to get a maximum; the D-lines were distinctly visible. The speaker then exhibited some lantern slides priuted by the process, with gelatine as the vehicle; they were rich in fine detail, and in one of them the image was of a green colour.

Mr. Davison asked what were the industrial applications of the process?

Mr. Elder remarked that this was not the first process in which the substance sensitive to light was a purely organic body, for at the very dawn of photography Niépce de Châlons nsed bitumen, which was of organic origin, although a mineral substance. When diazo-primuline was decomposed by light, was the substance left the corresponding phenol?

Mr. Bevan replied that it was too soon to say much about industrial applications, but it was hoped that amateurs would take it up for purposes of decoration, and he believed that some silk manufacturers were about to use it in a practical way. He had overlooked the fact that the bitumen process depended entirely upon the sensitiveuess to light of an organic substance of mineral origin. In the decomposition by light of diazo-primuline, he thought that the corresponding pheuol was not produced.

In reply to Dr. Pattersou, he farther stated that the diazo-primuline is rather more sensitive when wet. Paper prepared with it will not keep long after the diazotising; it should be used almost at once, and developed as soon after printing as possible. On gelatine the substance is about one-tenth less sensitive than upon cotton, and the exposed gelatine plates will keep for about a month. He thought it to be cheaper than any photographic process with which he was acquainted. He thought that the process could be applied to wood; so far as they had tried it the image had a sunk-in look ou wood, but means might be adopted to keep it on the surface. In reply to auother speaker, he stated that when the purple developer was used the image must not be washed after coming out of the tartaric acid bath; it must remain acid. The temperature of the developers has little influence.

Mr. Maskell asked whether it had been tried in the camera.

Mr. Bevan replied that by two hours' exposure in the camera they had obtained a weak positive image. With gelatine plates it was impossible to tell when the image was properly exposed; their plan was to expose small test pieces under the same conditions, and every now and then to drop one of them into the developer; it is possible to over-expose, and thereby to weaken the image.

Mr. Elder asked if other amido bodies had been tried.

Mr. Bevan replied that many of them were sensitive to light, but he thought that primuline was the only one which could be successfully applied to practical purposes; all the others are difficult to fix on the fabric, and the results wash out. They were inclined to think that the quicker the printing, the brighter were the colours produced.

Mr. Dallmeyer had read that green could not be produced by the process. How had they produced the greeu image iu oue of the lantern slides?

Mr. Bevan replied that they had only obtained it lately under uncertain conditions with gelatine, while developing a blue colour; it passed through the greeu stage first, so that he could not give any definite information on the subject. Wheu they could mix the developers they could vary the colours, but some would not mix. An exceediugly nice effect was obtained by developing the maroon colour first, and then putting the print in the purple developer. They had found that they could print by an arc electric light of 2,000 candle power at a distance of two feet; the exposure then required was ten or fifteen minutes. In reply to another question, Mr. Bevan said that he did not think that they should charge for a licence to use the process; still, they naturally expected some returu for the invention, and should probably hand the matter over to somebody more versed in business matters than they were.

The President remarked that wherever light was absorbed work must be done, and Mr. Bevan had said that in this process yellow light was largely absorbed, so he was curious to learn the spectrum value of the substance; he expected that its solution would give a spectrum with a baud in the orange. Wheu aniline is acted upon by bromine an orgauic bromide is obtained, and this, when sensitised with nitrate of silver, yields silver bromide, and a compound of a yellow colour, which gives the power of photographing a considerable distance iu the red below the A line of the spectrum. He (Captain Abney) had found that the same effects could be produced by changing the molecular form of ordinary bromide. The dye was very sensitive in the orange, and on examining the spectrum of the said organic substance he had found that it gave a band in the orange. If Mr. Bevan were willing to come at any time to his laboratory at South Kensington, he could give him facilities for carrying on spectrum experiments, and without being dependent upon sunlight. The sensitiveness of the new substance seemed to be very great, and the whole process exceedingly beautiful, to the extent that it ought to be commercially and artistically useful. He thought that it was one by meaus of which a lady would like to make beautiful curtains from her own designs, especially as it is the fashion now to consider yellow to give artistic effects. On behalf of the Camera Club, he would say that the Club was much obliged to Messrs. Green, Cross, and Bevau for showing its members the beautiful process, which, he hoped, would soon becoue beneficial to the photographic world at large.

Mr. Bevan replied that he should be glad to avail himself of the favour of so carrying on his spectrum experiuents, and that, instead of his demonstration being a favour to the Club, he thought that the obligation was the "other way round."

The London and Provincial Photographic Association.

November 13th.—Mr. A. Cowan in the chair.

The eveuing was devoted to judging slides sent in by members for competition; the whole of the members present acted as judges. The trausparencies were made from four negatives; the subjects were, "Cottage at Shere," "Miller's Dale," "Matlock Bath," and "Girl at Well." This set of negatives had beeu handed in succession to those members who had previously signified their intentiou of competiug. Two siugle lanterns were employed, projecting discs side by side on the screen. The process of judging was as follows:—A slide was inserted in the carrier of each of the lanterns, and the pictures

carefully compared on the screen as to detail, transparency of the shadows, colour, and other matters which go to make a good slide. The picture voted to be the best was allowed to remain on the screen until displaced by one that was decided to be of greater merit. The competition was an exceedingly close one, and in several cases only decided by very narrow majorities. Each slide had a distinguishing mark or motto ; corresponding marks were enclosed in envelopes, together with the name of the competitor. The result of the competition was as under :— 1st—"Miller's Dale," "Matlock Bath," T. E. Freshwater ; "Cottage at Shere," A. C. Pemberton ; "Cottage at Shere" G. W. Atkins ; "Girl at Well," P. Everitt. 2nd—"Miller's Dale," "Matlock Bath," H. M. Hastings ; "Girl at Well," A. C. Pemberton ; "Cottage at Shere," C. H. Cooke.

The processes employed were wet collodion, Mr. T. E. Freshwater; wet collodion toned with gold, Mr. G. W. Atkins ; gelatine lantern plates developed with hydrokinone and carb. ammonia, Mr. A. C. Pemberton ; collodio-bromide, Mr. C. H. Cooke.

The Chairman, at the conclusion, spoke about the high quality of all the slides exhibited, and said that it was the best competition that had been given by the Association, and that the task of judgiug not an easy one.

Subsequently a number of slides was projected on the screen contributed by Messrs. G. Newman, W. H. Summers, and J. B. B. Wellington.

West London Photographic Society.

A meeting was held on the 14th inst., at Broadway Lecture Hall, Hammersmith, Mr. W. A. Brown in the chair.

Mr. Jones (Platinotype Co.) gave an account of the platinotype process, and illustrated his remarks by practically demonstrating its working.

In the discussion which followed, Dr. Low said expense need not deter anyone from taking up platinotype ; a spirit lamp or gas stove and an enamelled iron dish from the ironmonger were all the apparatus required. He considered the hot bath process the easiest, cheapest, and most satisfactory of all printiug processes, providing the negative was a good one. The temperature of the solution was not very important ; anything above 120° Fah. gave good results. As to printing, he could do nothing with a thin negative, but with a good one he found the strouger the light the better the print. The "D" salts, as used in the cold bath process, gave much better results thau the plain oxalate solution.

Mr. Blackmore said that the sepia process was the one he preferred. He had sometimes been troubled with small black spots. He had not had time to puzzle the matter out, but thought they might be caused by small particles of calcium getting ou the paper. A curious experieuce had happened to him recently ; he had been under the impression that it was not possible to reduce a platinum print, but on putting a very much over-exposed sepia print in the developer it flashed up immediately very dark and dense, then on transferring it to some strong hydrochloric acid, considerable reduction took place, and the print became quite passable. He would like to know whether the black process was susceptible of reduction in the same way.

Mr. Whiting expressed dissatisfaction with the colour of platinum priuts. He pointed out that there were many shades of black, and he himself preferred a warm black. Would the use of "D" salts give a softer image or a differeut colour? It was rather unfortunate that we could not modify the developer to meet the exigencies of under and over-exposure.

Mr. Hodges agreed with Dr. Low and others that platinum was one of the easiest processes to work, the only difficulty being in the exposure. Unless the prints were carefully watched while printing, it was difficult to detect over-exposure. The negative need not be very dense, but must be full of gradation to produce a good result. He preferred a negative developed with plain pyro of a yellowish hue, but not stained, to one developed with sulpho-pyro. Like Mr. Whiting, he admired the warm black colour, but could rarely produce it. He had tried the addition of bichloride of mercury to the developer, but, although the colour obtaiued was warmer, the lights suffered as a rule. Very much over-exposed prints could be entirely saved if developed in quite cold solution. It was very necessary to remove all traces of iron by using a sufficient number of acid baths—four or five in some cases would be required. If the operation were not thoroughly performed the prints would turu yellow.

Mr. Jones replied that it was better to print a thin negative in a weak light, but a vigorous one would print just as well in the sun. When he spoke about the light, he referred to examining the print. The black specks were caused by minute particles of metal, either in the paper or from the tin. Calcium would produce white spots. The strong acid would reduce a black print just as it did the sepia one, but would rot the paper. Old paper would tend to give warm toues, and a very hot developer would also give a brownish black.

At the next meeting, November 28th, Mr. Andrew Pringle will give a demonstration on "Bromide Printing."

Hackney Photographic Society.

A meeting was held on the 13th inst., when Dr. Roland Smith presided.

The Secretary aunounced that this was the last day for receiving prints for the competition, and that Mr. Henry Crouch had promised to give a lens as one of the prizes.

There is to be an exhibition of the Society's pictures (competition) and lanteru slides on December 11th next, at St. Andrew's Hall, Well Street.

The members had their slides put through the oxy-hydrogen lantern by the Secretary. A good number was shown.

Birmingham Photographic Society.

At the ordinary meeting of the above Society, held at the club rooms on the 13th inst., Mr. J. P. Stone in the chair, Mr. J. H. Pickard gave a practical paper on "Film Photography," and illustrated his remarks by passing a stripping film negative through all the stages, and thus making an enlargement from half-plate to 12 by 10 inches.

The Secretary anuounced that Mr. R. Keen, of Derby, had offered to place any negatives he had of Warwickshire at the service of the Survey Council.

Glenalmond Photographic Club.

The fortnightly meeting was held on Nov. 15th, when the president, Mr. A. S. Reid, M.A., F.G.S., took the chair.

It was resolved that a lantern slide competition should be started, open to members of the Club ; and, after discussing other busiuess, the usual exhibition of members' photographs and apparatus took place.

At a previous meeting six new members were elected.

Mr. C. F. Scobell gave a description of the Kodak and its working, with special demonstrations of its parts, and specimens of work doue by him.

Glasgow Photographic Association.

The first general meetiug was held on November 6th in Bath Street : Mr. William Lang, jun., occupied the chair.

The Secretary's report for session 1889-90, as also the treasurer's, were read and adopted. Office-bearers for current session were theu elected as follows :—*President*—Mr. William Lang, jun. : *Vice-Presidents*—Messrs. J. Craig Annan and Archdeacon Watson ; *Council*—Messrs. Johu Annan, Robert Gardner, William J. Mellwrick, Andrew Mactear, George Mason, and John Morrison ; *Treasurer*—George Bell ; *Secretary*—Percy Rowden.

A vote of thauks was given to the retiring secretary, Mr. J. Craig Annan, for the work he had done for the Society during the time he had held office. Fifteen new members were then elected.

Dr. Emerson's book (presented to the Society), "Life iu East Anglia," was shown to the members, and Mr. J. Craig Annan read a paper in connection therewith. A lively discussion followed.

Specimens of diazotype printing were exhibited, and several series of transparencies were afterwards passed through the Society's lanteru.

THE PHOTOGRAPHIC SOCIETY OF IRELAND.

AN ordinary meeting of this Society was held in the rooms, 15, Dawson Street, Dublin, on Friday evening, 14th inst., Mr. HERBERT BEWLEY in the chair.

A number of questions was read from question box, and one inquiring whether collodiou alone or collodion with a surface of gelatine gave the best results in enamelling excited a discussiou, the general opinion being that gelatine was unnecessary except as a protector to the collodion filu.

The CHAIRMAN then called on Professor J. Alfred Scott to give his paper on "Toned Photo-Micrographs."

In the course of his remarks, Professor SCOTT said that iu 1889 he was shown some beautiful photographs, on Liesegang's aristotype paper, of the spinal cord, taken by Dr. Ringrose Atkins, of Waterford. They were of such a brilliant tint as to give a correct idea of the original specimeus when treated by some staining agent. Dr. Atkius kindly explained the process he had adopted. Prof. Scott made a few modifications in the process, adaptiug it specially for lantern slides, and then found that the process could be extended into other colours. Dr. Atkins' process consisted in touing the silver image with ferrocyanide of uranium. The completed slide, well washed in alum to remove the sodium thiosulphate from the gelatine, was placed in a bath composed of equal parts of a 1 or 2 per cent. solution of potassium ferridcyanide ($K_6 Fe_2 CN_{12}$) and a 6 per cent. solution of uraniuu nitrate. According to the length of time the plate is immersed, the tone passes from a brown to a red. The process would appear to be that silver and potassium ferrocyanides are formed, and the latter is subsequently decomposed, formiug uranium ferrocyanide, the silver salt remaining and giving rise to the opacity mentioned. At this stage the colour can be heightened and rendered more transparent by placing the slide in sodium thiosulphate, which dissolves the silver salt, and leaves an image formed solely of uranium ferrocyanide. The next step was an easy one. Given that the actiou of a 2 per cent. solution of potassium ferridcyanide ($K_6 Fe_2 CN_{12}$) is to form a pale, whitish image of silver ferrocyanide, then let the plate be well washed to remove the free ferrocyanide from the gelatine, and afterwards flood it with a solution of ferric chloride. The image will then turn to au opaque blue, which can be rendered transparent if the silver chloride is dissolved out iu sodium thiosulphate. This latter method gives an image in Prussian blue, but the method is more easily worked for lantern slides thau any hitherto described.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A MEETING was held in the Mayor's Parlour, Old Town Hall, on November 12th, Mr. S. S. PARTRIDGE iu the chair. Two members were elected, and the details of the forthcoming conversazione ou the 26th inst. were communicated to the members.

Mr. H. SMITH, of the Eastman Co., gave the members some instructions in the development and general treatment of bromide paper, also practical hints as to the details of the process, such as focussing, vignetting, and the several after treatments. Mr. Smith then proceeded to give a practical demonstration of enlarging on bromide paper, aud produced a 15 by 12 enlargement on bromide paper from a Kodak circular negative of $2\frac{1}{2}$ inches diameter.

THE VIENNA PHOTOGRAPHIC SOCIETY.

Mr. FRITZ, technical manager of the State Printing Office, read a paper on the "Auastatic Printing Process," and gave a description of all the different methods employed, also of the method used at the State Printing Office. He exhibited specimens iu which prints twenty, fifty, and more years old were reproduced. The conclusion of Mr. Fritz's paper noticed the new patented process invented by Bartos, in which the sand-blast takes the place of the network used to get half-tone zinc etchings.

Mr. LAINER spoke on "Anhydrous Sodiochloride of Gold."

Dr. J. M. Eder showed some new coloured prints by Veres, of Klauseuburg. Dr. Emerson's photogravures were exhibited, and studies of female models by O. Anschütz, of Lissa.

Answers to Correspondents.

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

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

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

FONTAINE.—By referring to the indices of the last ten volumes, we find uo meution of such a machine. Mr. Acworth's exposing apparatus is figured on page 569 of the NEWS for September 7th, 1888.

H. W. N.—*Blisters on Albumenised Prints.* This is a very common complaint of late. We should advise you to fumigate the silvered paper dry, instead of adding ammonia to the sensitisiug bath, which always teuds to loosen the adhesion of the albumeu filu. The paper is a well-known brand, approved in other quarters, and you may be able to use it in this manner, employing the precautious already takeu.

VARNISH.—*Difficulties Encountered.* 1. We do not think it possible that the varnish, even if applied too hot, should clear off the retouchiug peucil marks from one side of the face without affectiug the other. Your experience points to the desirability of inspecting the negative, in future, before applying the varnish. 2. If overheated in this process we should expect to sce little blisters or bubbles formed within the gelatiue film. 3. Examine with a magnifier to look for traces of black lead on the off side of the face, and this will show you whether the heat applied has been too great. In damp weather always give time and gentle temperature for slow dryiug of the film before warming up to the point of varnishiug.

L. E.—*Husbands' Papyrotint.* A short accouut of this process was given some years ago in the *Photographic Society's Journal*, with au illustration of Rochester Cathedral; but full working details will be found in Mr. W. T. Wilkinsou's "Manual of Photo-Eugraving," &c., page 106.

A MEMBER.—*The Photographic Society's New Premises.* As soon as the arrangeuents are completed the ordinary and techuical meetings of the Society will be held at 50, Great Russell Street (opposite the eutrance to the British Museum), where it will be easy to provide for the holding of small periodical displays, but the annual exhibition will be held at one of the West End picture galleries as heretofore. There are rooms now being fitted up for library, stores, and working laboratory, accessible to members under regulated conditions, and open during the daytime as well as certain eveuings of the week.

ANXIOUS ONE (Kendal).—*Transferotype Paper.* Enquire of Messrs. Morgan and Kidd, who used to supply a bromide-coated canvas, and with this there would be no reversal of the iuage.

F. P.—*Photography in Colours.* The whole subject was very fully treated of in the last YEAR-BOOK, fourteen pages being devoted to it by the Editor. Since theu there is little or no progress to record, unless you include under this headiug the two primuline processes, which give coloured priuts, it is true, but not withiu the meaning of what is commonly understood by photography in colours. We know of no other novelty in this counection.

C. H. COLLINGS.—A full report of the matter to which you refer appeared in the *Newcastle Weekly Chronicle* of Saturday, the 8th iustant.

A. M. S.—*The Quadrant Hand-Camera.* In this apparatus the holders have a couple of projecting pins, which enable the plate to be swung into position for exposure from the horizontal magazine at top to a vertical receptacle at the back of the camera, passiug through an arc of 90 degrees or quadrant—hence the name.

M. A.—*South London Photographic Society.* Under the old name a new society has been constituted which bids fair to do useful work. Besides this, there is a proposal for a South London Club to be formed on the lines indicated in Mr. Harold Senior's letter on page 874. See the NEWS of 7th instant.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1682.—*November* 28, 1890.

CONTENTS.

A STANDARD LIGHT IN PHOTOGRAPHY.

A few days ago, the full report of the late International Congress of Photographers was published at Paris in the form of an illustrated and interesting volume. In it full details about the accepted amyl-acetate lamp to produce a standard light for photographic use are given, and on the next page we reproduce the working drawings for the construction of the lamp, in the hope that a sorely-felt photographic want will soon be met in commerce. The standard selected is inexpensive in first cost of apparatus and in use, and the decision of the Conference to adopt an amyl-acetate lamp was a wise one.

The lamp, it will be noticed, differs but little from the ordinary benzoline lamps commonly selling in shops at a few pence each, except that it is much better made, and to accurate measurements; moreover, it has extra adjuncts, and twin screws to regulate the wick. In use, the outside of the lamp must be kept clean, otherwise the amyl acetate (pear oil) will diffuse an aroma throughout the room, and the wick must be kept low enough in the tube not to itself enter into combustion. Whether petroleum spirit or benzoline would not answer practically if not theoretically as well as pear oil, or whether it cannot be specially prepared to answer the purpose, is a question for the future; at all events, Professor Leonhard Weber, of Breslau, once used a benzoline flame as a standard in photometric apparatus.

The Standard Light Committee of the Photographic Congress reports that the standard of light it recommends is produced by means of a lamp with a metallic reservoir and a non-projecting wick, burning acetate of amyl or amylacetic ether. This lamp is represented in figs. 1 to 5. It is made of nickel-coated brass, and consists of a cylindrical reservoir with a flange forming the base of a dome carrying a wick-tube and its screws. The base of the wick-tube is furnished with a fillet upon which slides the extremity of a cap, which is placed there to prevent the evaporation of liquid when the lamp is not in use.

The same wick-tube receives, when the lamp is in use, a screen formed of a thin plate of blackened brass, pierced with a horizontal aperture, and furnished behind with spring clip which adheres to the tube by friction, and permits the screen to be fixed at any height whatever.

The system of screws to regulate the wick is formed of two fluted cylinders placed parallel to each other on opposite sides of the wick-tube, and of which the teeth penetrate to the inside of the tube through two lateral cuts. Two toothed wheels, mounted on the axes of these cylinders and gearing into each other, cause them to work simultaneously. The axis of one of the cylinders is prolonged to the exterior, and terminates in a milled head which is turned to regulate the height of the wick.

The wick is of cotton, plaited cylindrically; its diameter is five millimetres.

This system permits the regulation of the wick, without exterior openings permitting the escape of vapour of ether.

The principal dimensions of the lamp are as follows:—

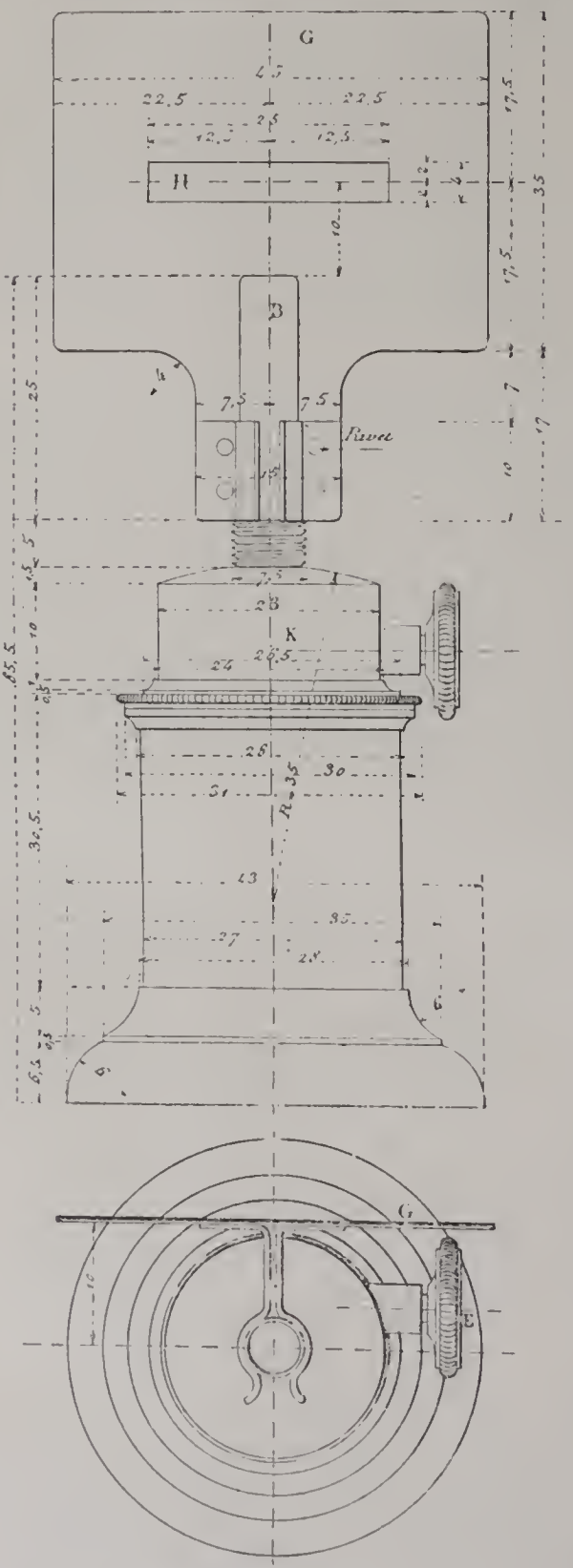
Interior diameter of the wick tube		5	mm.
Total length of the wick tube		58*	,,
Height of the end of the wick tube above the dome		30	,,
Total height of this extremity of the wick-tube above the base of the lamp		85	,,
Approximate contents of the reservoir to the base of the dome		10	c.c.
Dimensions of the rectangular part of the screen	Breadth	45	mm.
	Height	35	,,
Dimensions of the opening in the middle of the height of the screen	Breadth	25	,,
	Height	4	,,
Distance from the plane of the screen to the axis of the wick		10	,,

The acetate of amyl used with this lamp is a colourless liquid, very volatile and odorous, of well-defined chemical composition, and easily procured pure. It is an ether obtained by treating a mixture of acetate of soda and sulphuric acid with amylic alcohol or potato spirit. It is employed by perfumers and confectioners

* The great length of the tube notably reduces the length and brightness of the flame, but it prevents the heating of the reservoir, and assures the constancy of the lamp. The height of the flame should be so regulated as to leave the wick in the interior of the tube to prevent it from being burnt.

under the name of essence of pears, and serves notably to give an aroma to the sweets called "English bonbons," but for this use it is nabitually diluted with alcohol.

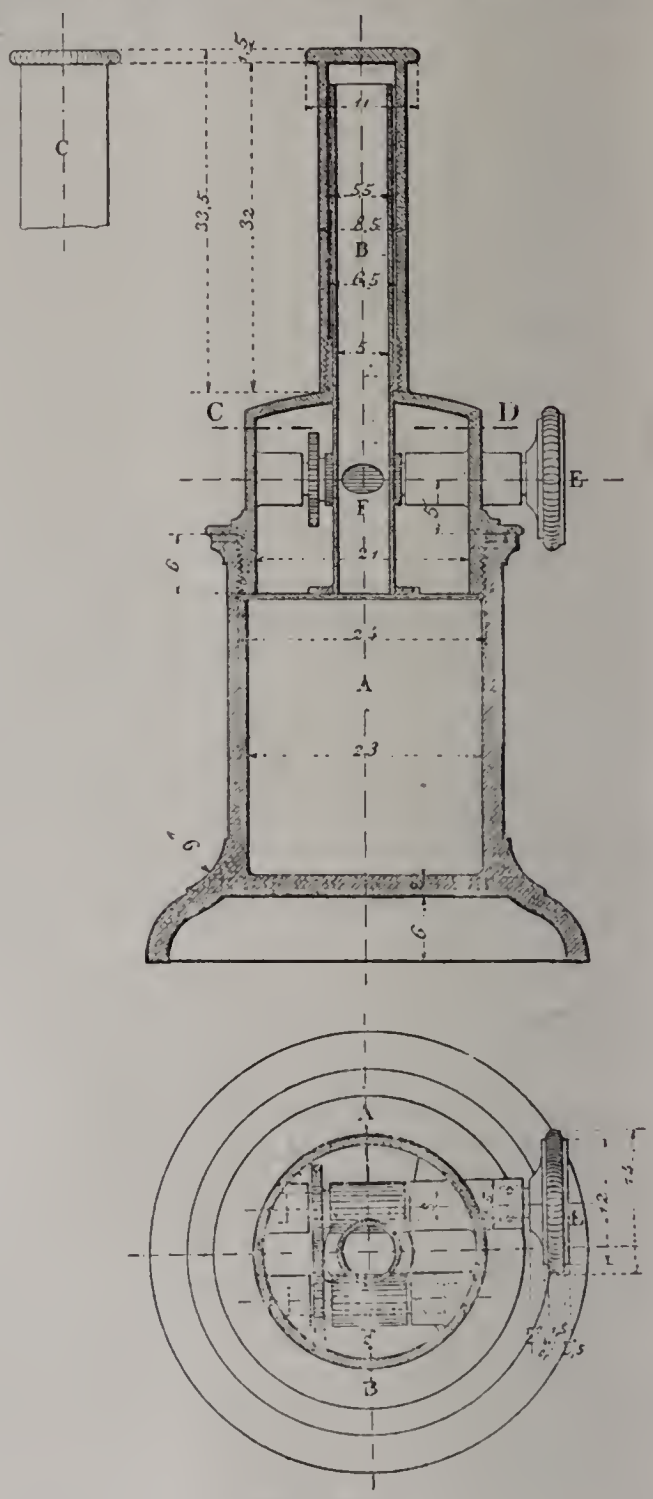
Pure acetate of amyl has a density of 0·87; its



Figs. 1 *and* 2.

boiling point is 125° C., and its price in France is from ten to twelve francs a kilogramme.

To prepare to use the lamp: after having unscrewed the dome, the reservoir is to be filled with amyl acetate almost to the screw thread, and the dome is replaced after making sure that the wick is in good condition,



Figs. 3 *and* 4.

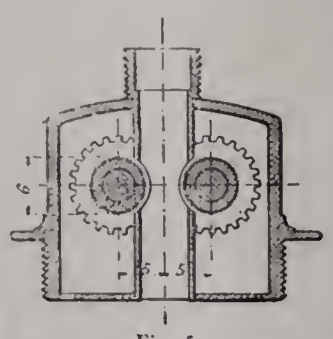


Fig. 5.

and long enough to pass into the liquid when its upper end is at the upper orifice of the wick-tube. The aperture of the screen will then be opposite the most luminous part of the flame, and, placing oneself in front of the screen with the eye at the level of the aperture, a luminous section of the flame will be seen, having the whole

breadth of the flame, and a height of four millimetres, therefore presenting a luminous surface equal to one-fifth of a square centimetre. In working with the lamp, it is sufficient to make sure that the flame burns regularly and keeps itself sensibly at the fixed height.

An improvement in the report would have been a complete specification as to the nature of the wick to be employed. Another improvement would have been a full acknowledgment that the original pear oil lamp was devised by a German, Hefner-Alteneck, whose name is but once incidentally introduced, and then not as the inventor. Hefner-Alteneck's lamp was not of the same dimensions as the one adopted at the Paris Conference.

Herr von Hefner-Alteneck, in his paper describing his lamp, read before the Electrotechnical Society of Berlin, stated that the wick-tube is of German silver, 25 millimetres high, 8 millimetres internal diameter, and 8·2 millimetres outside diameter. The height of the flame is 40 millimetres from the edge top of the wick-tube to the top of the flame. He says that the light should not be used for measurement until it has been burning at least ten minutes. The proper height of the flame is shown by a gauge-rod fixed to the lamp, and carrying two horizontal sights with which the point of the flame must be in line. The wick is a strand of cotton yarns with fifteen or twenty separate threads laid together straight until the wick-tube is filled without squeezing; a slight inaccuracy in this is not of practical consequence. It is essential that the wick should be cut quite level at the top. The quantity of amyl acetate in the lamp is immaterial so long as all the ends of the wick are immersed. The illuminating power of the flame is only normal when it is burning in free air—that is to say, without a chimney—but when draughts cannot be avoided a cylindrical glass chimney may be used, eighty millimetres high, and fifty-five millimetres internal diameter; it is carried on a clip on the rod which also carries the sights. When the chimney is put on, the flame drops slightly; if it be again brought up to the standard height, the illumination is about two per cent. less than when the flame burns in free air.

The Paris report refers to Mr. Bothamley's modification of the pear oil lamp published in the Photographic News, and adds that the labours of the Committee of the Conference were finished before that article was printed.

Le Touriste Photographe, of Bordeaux, has, Japanese fashion, its title-page at the end. It is edited by M. P. Sivan, and on its premises is a developing room for amateurs.

Photographs for an Indian Exhibition.—Mr. H. P. Robinson has sent the following platinum-toned prints to our Exhibition:—(1) "A Strange Fish;" (2) "Against the Wind—A Race with Gran'dad;" (3) "Stalking a Trout—Sunlight through Mist;" (4) "What Sport?" (5) "Over the Hedge;" (6) "What is it?" (7) "Sunny Hours;" (8) "Shades of Evening." I shall defer describing these pictures until after the exhibition, as they have been sent for competition; but there is a unanimity of opinion here that never before has Mr. Robinson sent so good a collection.—*The Journal of the Photographic Society of India.*

DRAWINGS FOR PROCESS BLOCKS.

During the past few years newspapers and periodicals of all kinds have blossomed into illustrated publications, and we know that this is due to the ease with which a printing-block can be produced, without the intervention of an engraver, by the photo-zincographic or one of the allied processes. There has, therefore, sprung up a demand for draughtsmen who are capable of executing the kind of drawings which are alone suitable for this quick method of reproduction as a printing-block ready for the press, and schools are being started where the necessary education for such work can be obtained.

Among photographers generally, there are many who are adepts with their pencils—practical artists who have been tempted to join the photographic army because of the attractive features of such work, and also because they knew that they could bring to bear their art knowledge upon it, and so hope to achieve something in the way of portraiture rather above the average. From such men have our best photographers sprung, while there are not a few who, although they have not been able to reach the topmost rung of the ladder, are sufficiently clever with their pencils to work up enlargements, and to do much in other ways to help them in their daily practice. To photographers having such artistic tastes, a knowledge of the best means of executing a drawing from which a printing-block can be made should be most valuable, and we propose to give in the present article a few hints upon this important subject, and, for the sake of simplicity, we will only deal with the method of producing a line drawing in ink for the zincographic process.

It is a necessity of this process that the drawing shall consist of lines or dots, or the two combined, and that the various half-tones, or *tints*, as an engraver would call them, shall be made up of such dots or lines placed nearer or closer together, according to the depth of tint required. The zinco process is essentially a black-and-white method, which admits of no half-tones, as a photographer would understand that term, these half-tones being made up of the juxtaposition of lines as just described. We would advise anyone who has never done any of this sort of work to study a collection of drawings of the kind as a preliminary operation. He will have no difficulty in obtaining such a collection, for it has for some time been the very commendable custom to issue illustrated catalogues of our chief picture exhibitions, both oil and water-colour. In these catalogues, rough, and in some cases highly finished, sketches of the principal pictures are reproduced by the process under consideration, and as these sketches are furnished by the artists who have painted the original works, they are, as a rule, executed in a masterly manner, and, so far as is possible in such a medium, the peculiarities of touch are faithfully reproduced. The same remarks apply to Mr. Blackburn's admirable "Academy Notes," and we should also recommend the student to get the French publication, containing nearly three hundred pictures, entitled

"Catalogue Illustró du Salon," which can be obtained through any foreign bookseller. After careful examination and dissection of such pictures with a good magnifying glass, the student will learn how the different effects are produced by different hands, and will be tempted to try himself what he can do in the same direction.

The materials are of the simplest. Bristol board of good quality is the basis to work upon, while the best ink to employ is "Stephens' Ebony Stain." Ordinary indian ink rubbed up in a saucer will, after a short time, thicken, clog the pen, and refuse to flow with ease, but the medium which we recommend has none of these faults, while, at the same time, it gives an intensely black line. Some artists prefer to work upon a chalk-faced card, which is manufactured for the purpose, for the reason that the lines inscribed upon its smooth surface are more perfect in outline than is possible on Bristol board. We should, however, advise the tyro to begin, at any rate, on the latter material, and to try the other when he has had a little practice.

It is the invariable rule to draw the original picture a good deal larger than it is intended to be when finished in the form of a printing-block, for, by this artifice, the general work is rendered finer. It would be next to impossible, indeed, for the finest pen to trace lines so delicate as those represented in several of these process pictures. But the amount of reduction which is allowable is a question that requires very careful consideration. We once saw a very beautiful pen and ink drawing measuring about twenty-four inches in length, which was executed by one of our first artists. It was required to reproduce this in block form, but, in the process, the original was reduced to about half-plate size, with the result that the details seemed to be all reduced to a uniform, flat, ineffective grey. The best rule to follow is to ascertain first the size which the future block is desired to be, and then to make the drawing not more than about twice its length and breadth —that is to say, four times the area that the picture is subsequently to be.

In such work there is always a temptation to overelaborate by filling in every atom of space with an assemblage of fine lines. This is a mistake, for the beauty of a drawing does not depend upon the amount of work which it contains, but rather upon the disposition of its lines.

THE EDINBURGH PHOTOGRAPHIC EXHIBITION.*

BY WM. LANG, JUN., F.C.S.

IF one were disposed to be hypercritical, the term "international," which has been applied to the interesting exhibition now within the walls of the Royal Scottish Academy National Galleries at Edinburgh, might perhaps be considered as somewhat overstating the case. The contributors from abroad are, perhaps, not more than six in number; this fact, however, only brings out in strong relief how largely and extensively the photographic art has been developed in our own country, when a collection so varied in character can be brought together without the aid of foreign contemporaries. The Edinburgh Photographic Society deserves to be complimented in this attempt, as we are told in their original prospectus, "to direct attention to the development, in recent years, of photography, and to stimulate further advances by encouraging artistic skill and invention." That the Exhibition will tend to increase public interest in the photographic art there can be no gainsaying. There are to be found what may be termed all the various phases of photography. The oldest practical processes—Daguerreotype and Talbotype—are represented; also the most recent—the primuline. The aid rendered to science by photography is well brought out by the spectrum photographs, the lunar photographs, photographs of various solar eclipses, and so on, displayed on the walls. What the microscope can show of the infinitely little, the photographic plate—"the retina which never forgets"—duly records for us.

In the various photo-micrographs exhibited, the one which should, perhaps, evoke the greatest interest at the present moment, in view of recent investigations, is the bacillus of tuberculosis. To the popular mind, which, to a large extent, considers that photography has only to do with the making of pretty pictures, the scientific applications of photography to which reference has been made should come as a revelation. In meteorological observations photography will yet come to play a most important part; as a forecast of work to be done in this direction, special interest attaches itself to the cloud pictures which have been sent in for exhibition by the Scottish Meteorological Society. Then, again, as showing how photography enters into the daily affairs of our ordinary life, a significant example is to be found in the exhibit forwarded by the proprietors of *The Daily Graphic*. The original sketch of the scene to be reproduced in the example shows the appearance presented by the railway disaster at Taunton; the negative taken therefrom, the type blocks which have been secured by its means, the corresponding composition mould, and finally, the cylindrical form the actual printing surface is made to assume—all form not only an interesting but a highly educational exhibit.

For the purposes of the wood-engraver, the production of a silver print on the wood block itself presents obvious advantages. Several instructive examples of blocks prepared in this manner are to be seen in the Exhibition. Photo-engraving and photo-etching processes are well represented by the finished pictures scattered over the walls of the various rooms, while collotype reproductions have not by any means been overlooked. Specimens of photo-relief printing—or, to give it its more lengthy designation, photo-zincography—are shown, which illustrate well the nature of the process and its applications.

It was intended originally by the executive that the various classes should be apportioned off by themselves; but the wealth of material that was forthcoming was such, that this idea had to be abandoned. Consequently, the classes are all intermingled, and although this arrangement may give a little more trouble to the jurors when they enter upon their labours, it has the advantage that there is a freedom from monotony, which might otherwise have arisen. This was the plan adopted in the Photo-

* To make way for this general description of the Exhibition by Mr. Lang, we postpone the publication of the conclusion of our description of the apparatus there until next week.—ED.

graphic Section of the Glasgow International Exhibition of 1888, and met with general approval there.

From the fact that the writer has been appointed one of the judges, it would scarcely be in accordance with the fitness of things that he should criticise individual competitive pictures, but a few remarks in a more or less general way will not surely come amiss. It was intended that all the pioneers of the photographic art should be represented, as far as it was possible, by enlargements. This has only been in part accomplished. A very interesting enlargement by Moffat, of Edinburgh, of Fox Talbot is to be found in the first room on entering the Exhibition. This picture was taken in the year 1865, and a note in the catalogue states that it was the only time our English pioneer sat for his portrait. Daguerre—an enlargement from Mayall's picture by Nadar, of Paris—is to be found in close proximity to Talbot. Herschel's lineaments are well presented to us by Mrs. Julia Cameron's head-study of the famous astronomer and philosopher. Becquerel and Niepce de St. Victor—the latter produced by Nadar—are duly represented; but this would seem to exhaust the list. It is unfortunate that the Council could not have gone farther, and given the whole of the illustrious founders, as they had proposed. The Exhibition is particularly rich in specimens of Rejlander's work. There is, of course, the somewhat disappointing *magnum opus* of the Dutchman, "The Two Ways of Life," a composition picture made up from a great number of single negatives. The copy shown, which presents a somewhat faded appearance, belongs to the Edinburgh Photographic Society. "Catching—Caught," "Mental Distress," "Oh! Missus," "Baby," "She's looking at me, the dear creature," &c., &c., all indicate a power possessed by Rejlander of making up a picture from slender materials which has never yet been surpassed by any subsequent worker.

One has also to remember that there were no rapid plates in Rejlander's day. What might not have been done by him had he worked under present conditions? Glancing at some of the calotype prints produced by D. O. Hill, the slowness of the sensitive material is brought before us very palpably by the strained appearance of the sitter, and one can see that strong sunlight has been streaming down on the poor unfortunate's face. Many of D. O. Hill's pictures were taken among the tombstones in Greyfriar's Churchyard. Apart from the long exposure under the conditions aforesaid, the surroundings were such that a cheerful aspect was scarcely to be expected. Several frames of D. O. Hill's work are to be found in the Exhibition, and very many of the portraits consist of men famous in their day and generation; sufficient, perhaps, to note the following:—Sir David Brewster, John Murray, James Ballantine, David Roberts, Dr. John Brown, the author of "Rab and his Friends."

Before bringing to a conclusion the somewhat fragmentary observations herein recorded, a special reference should, perhaps, be made to the catalogue which has been issued in connection with the Exhibition. It is a tasteful compilation, and has interspersed throughout its pages several very artistic pictures produced by various photo processes. Several pages are devoted to an historical *resumé* of photographic progress, and many of the more important processes are given in outline. During the time the Exhibition is to remain open arrangements have been made for lectures to be given bearing on photographic matters.

TRANSFERRING GELATINO AND COLLODIO-CHLORIDE PRINTS TO GLASS.

BY HERMANN E. GUNTHER.

In making transparencies as lantern slides or prints on opal glass by the gelatino-chloride process, the emulsion may be poured upon glass plates, and these exposed in the printing frame in quite the same manner as gelatino-chloride paper. In this case, however, plate glass must be used for the negative as well as for the print, since, ordinary glass being uneven, the prints would otherwise be somewhat wanting in detail and half-tones. Furthermore, especially constructed printing frames are required, allowing the watching of the progress of the impression without disturbing the negative.

A much simpler method, yielding transparencies and lantern slides of equal beauty to the printing-out process, consists in transferring an ordinary print on gelatino or collodio-chloride emulsion paper directly to glass.

In the case of gelatine-chloride paper, the following method may be used. After drying, the print is immersed once more in water, and, after removing it from the water bath, it is squeegeed on to a glass plate, allowed to dry, and then steamed over hot water, or put into a dish containing hot water. From time to time a pin or the point of a knife should be passed beneath a corner of the paper, to try to loosen the paper without the picture; if you succeed, strip the paper off the picture, and rinse the latter, which rests upon the glass plate, with cold water.

According to L. Imperatori, the same method may be employed in the following manner:—

The glass plate should first be well washed, dried off, rubbed off with some acetic acid, and then coated with an aqueous solution of gelatine or glue, and dried. The prints to be transferred should not be allowed to dry after washing, or, if that has been done, should be soaked for at least two hours in cold water. They should then be laid on the prepared glass plates, picture side down, in the same way as the prints are squeezed on ebonite or ferrotype plates in order to render them glossy, carefully avoiding all air-bubbles. One corner of the print is then carefully lifted, and the gelatine film separated from the paper at this corner; two sheets of blotting paper are next placed upon the print, a glass plate over these, and the whole allowed to dry under pressure. The print should be exposed to the hot water vapour, but not before it has been perfectly dried. For this purpose water is heated up to the boiling point, and allowed to cool down to 150°F. The print is then held over the vapour from the water for about four to eight minutes, and when the film has become soft, the corner of the paper which has been separated from the gelatine film earlier is carefully lifted up, and the paper carefully peeled off, leaving the glass plate together with the picture exposed to the vapours of the hot water during this manipulation. To give the picture an extra gloss, Imperatori recommends the immersion of it in a warm water bath of about 90° F. after it has stood some twenty minutes in the air. This softens the gelatine film without dissolving it. The picture is next allowed to dry spontaneously, and is then varnished.

Though exceedingly fine results may be obtained by this process, I have found that it is rather complicated, and not entirely trustworthy. When the print on gelatino-chloride paper is exposed to the vapour of the hot water, it oftentimes happens that in spite of all care a part of the gelatine film is stripped off along with the paper, the print

remaining on the glass plate, consequently, often being a weak one. Much more trustworthy is the process involving the use of collodio-chloride paper, by which process I have produced a large number of lantern slides of great beauty. The method I employ is the following:—In a test-tube I heat 10 c.c. of distilled water, in which I dissolve 12 grammes of silver nitrate. The hot solution is poured into a vessel containing 40 c.c. of alcohol, which should be violently shaken to prevent the silver salt crystallising out. The mixture is then added to 320 c.c. of plain collodion of 2 per cent. Also, I dissolve 1 gramme of citric acid and 1·2 gramme of chloride of lithium in 20 c.c. of alcohol, which I add to the collodion and silver solution after filtering. This collodion emulsion should be kept in the dark in a well-stoppered bottle. With it I twice coat a thickly gummed baryta paper (kept in stock by the firm of Ed. Liesegang, of Dusseldorf, under the name of "Abzich-Papier C."), then dry it quickly before the fire. After drying, I float the paper for about one minute on an ordinary silver bath of 10 per cent., dry it again quickly before the fire, fasten the paper, by means of drawing pins, to a piece of pasteboard, and allow it to dry for at least two days in the dark. The reason for the repeated silvering of the paper is that only by the use of this second silver bath is it possible to produce prints of sufficient vigour and uniformity.

Printing is done as usual, but in the case of the production of transparencies it is well to slightly over-print until the lights show a light-brownish tint; for opals the time of printing is as usual.

Toning may be done with the acetate of soda bath, as in the case of albumenised paper, but the hypo solution may be used much weaker than for ordinary silver prints. Good results are also obtained by the use of one of the combined toning and fixing baths, as recommended for gelatino-chloride prints, but without alum. The print is allowed to remain in it until it appears violet by transmitted light. The print may be transferred to the glass plate in the following manner: A glass plate is coated with a 10 per cent. gelatine solution and allowed to dry. The print is immersed in cold water; also the prepared glass plate upon which the picture is laid under water. The whole is then taken out of the water and an india-rubber squeegee passed over it. After a short time it will be found possible to strip off the paper, leaving the picture adhering to the gelatinised glass plate. The picture is then fixed in hypo solution, thoroughly washed, and dried.

Another method of transferring, recommended by W. Kranzhoff, is the following:—

After toning and fixing, the print is thoroughly washed and squeegeed on to the glass plate, which has previously been cleaned with water. It is then, picture downwards, laid upon a table and allowed to dry. After the lapse of about fifteen minutes the paper may be loosened by means of the vapour of hot water. An ordinary coffee-kettle is well suited for this purpose. The water is heated up to the boiling point, and the glass plate, together with the adhering print, is passed with a circular motion through the vapour escaping at the outlet-pipe. After two or three seconds the paper falls down, leaving the picture adhering to the glass. To thoroughly clean the picture this operation may be repeated a few times, when the picture should be rinsed and allowed to dry. After about five minutes the picture will be perfectly dry, and quite finished.

THE TUNBRIDGE WELLS PHOTOGRAPHIC EXHIBITION.

LAST Wednesday the Tunbridge Wells Photographic Exhibition opened under disadvantageous circumstances, for the weather was bad, and the snow lying upon the ground there five or six inches deep. For the last two days snow has been falling in the district to the south of London, but none worth mentioning in London itself; the dirty atmosphere of the town checks the radiation of heat into space; the heat from the chimneys tends also to raise the temperature, and these combined influences may have had something to do with the phenomenon. Yesterday the snow at Dover was eight or nine inches deep.

Such weather thinned the attendance at the Exhibition, but those who were present seemed highly pleased with the lantern entertainment given to them by Sir David Salomons. The lantern employed was good in its design and construction. The projection lenses used on Wednesday were of twelve inches focal length, and, by means of brass framework fixed upon the base-board, their mounts receive support at the outermost ends as well as at the flanges; when lenses of shorter focal length are employed they, by suitable carrying tubes, receive the same support from the framework. The lenses are made to register from the front, on releasing screws on the bed-plate. All the registering arrangements for the limes and the traversing table are governed from the outside of the lantern. The gas supply system has complete cut-offs, so that it is not necessary to disturb the regulating taps after they have been once adjusted; there is also an arrangement for dissolving with the top and bottom of the lanterns without disturbing the one in the middle.

The condensers are of good design, and consist each of a meniscus and double convex lens; the hollow side of the former is turned towards the lime-light, but between it and the source of light is a piece of plate-glass to protect the condenser from the sudden action of heat. At the bottom of the lantern is a metallic tray to catch dust from the limes. The gas bottles are held by a wooden framework found to be of considerable convenience, devised by Sir David Salomons, who also had the lantern made from his own designs, and one of them includes a device for getting a true optical axis to the system in each lantern. He has also devised an improved reading lamp for use during lantern exhibitions. This is the tenth or twelfth lantern he has built, so it is the outcome of long experience. The manufacturer was Mr. J. H. Steward.

Among the photographs which Sir David Salomons projected on the screen last Wednesday, was one of the Royal Scottish Academy, in which the Edinburgh Photographic Exhibition is now being held. He exhibited high-class slides including widely divided classes of subjects; some of the slides were delicately coloured. He exhibited a picture of a house by night, in which the windows suddenly became lighted up, and initiated the uninformed as to the method of producing the effect; in so doing, he incidentally remarked that in the days of old, when photographic lantern slides were unknown, it was impossible to secure such accurate register as is now the case with the two slides used in producing the result. Such work is difficult to perform by hand-painting on glass.

The Exhibition, held under the auspices of the Tunbridge Wells Amateur Photographic Association, contains a pleasing collection of photographs to the number of 604 altogether, produced by about sixty exhibitors, and

it will close to-morrow night. The names of the officers and members of the Exhibition Committee we published a few weeks ago. The Tunbridge Wells Amateur Photographic Association was founded in 1887.

The following is the list of awards by the judges—Sir David Salomons, Bart., Mr. H. P. Robinson, and Mr. C. W. Hastings:—

Sir David Salomon's medal—F. G. Smart.

Other medals—Silver, Joseph Chamberlain; Bronze, Daniel Howard.

Class 1 (architecture)—Silver, Joseph Chamberlain, "Norman Doorway"; Bronze, F. G. Smart, "Interior of St. Cross." Class 2 (interiors)—Silver, Joseph Chamberlain, "Drawing Room"; Bronze, H. T. Wood, "Four Interiors." Class 3 (landscape)—1st, A. W. Pierson, "On the Medway"; Bronze, Daniel Howard, "At Fedsay." Class 4 (instantaneous)—Silver, F. G. Smart, "Fishing Boats in Whitby Harbour"; Bronze, W. B. Cassingham, "Feeding Chicken." Class 5 (genre)—Silver, F. G. Smart, "Fishermen Mending their Net"; Bronze, A. W. Pierson, "Carting." Class 6 (lantern slides)—Silver, A. W. Pierson; Bronze, Alfred Cornell. Class 7 (transparencies)—Silver, withheld: Bronze, Joseph Chamberlain. Class 8—withheld.

Open Classes for Amateurs.—Class 9 (landscape or seascape)—Silver, John Naylor, "Sunshine and Shadow;" Bronze, Ernest Beck, "Off to the Banks." Class 10 (genre)—Silver, John E. Austin, "The Love Letter;" Bronze, Alex. M. Morrison, "A Duet." Class 11 (lantern slides)—Silver, J. E. Austen; Bronze, E. G. Lee. Class 12 (architecture)—Silver, C. Court Cole, "Choir, Christ Church, Oxford"; Bronze, John Naylor, "Fountain's Abbey."

Professional Classes.—Silver, Percy S. Lankester, "Picture of Lady"; Bronze, Clarence James, "His First Model." Class 13 (landscape or seascape)—Silver, J. P. Gibson, "The Woods of Tyne"; extra Silver medal, Lyd. Sawyer, "The Smoky Tyne"; Bronze, C. P. Castine, "Village Scene in Kent." Class 14 (genre)—Silver, S. N. Bhedwar, "The Feast of Roses"; Bronze, Percy S. Lankester, "Picture of a Lady." Class 15 (lantern slides)—Silver, G. W. Wilson and Co.: Bronze, Percy S. Lankester. Class 16 (portraits)—Silver, Percy S. Lankester, "Mrs. Albert Barker"; Bronze, Clarence James, "His First Model."

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

When the Peckham and East Dulwich Photographic Society assumed the name of the well-known association of photographers that, after a long and honourable career of usefulness, was incorporated with the Photographic Club in 1887, some natural fears were expressed as to the result of comparison between the old and the new South London Photographic Societies. If, however, the promise of the exhibition on Friday and Saturday last in the Hanover Hall, Peckham, be fulfilled, all misgivings may be set aside, for there can be no doubt that the young Society, founded about eighteen months ago, has established its claim to high rank among suburban photographic associations. It already numbers over one hundred members.

At the first exhibition last year, held at Shawbury Hall, there were ten exhibitors, but on the present occasion there were about thirty-five, principally amateurs, who contributed a creditable collection of photographs.

On the opening night there was an attendance of 250 visitors, and on the following evening there was such a crowded assembly as to make the viewing of the pictures a matter of great difficulty.

The proceedings on each evening were opened with a programme of vocal and instrumental music by local artistes, followed by an exhibition of lantern slides by Messrs. Banks (treasurer), Boydell, Edwards (president), Gardiner (secretary), Palmer, Ransom, Rice, Walford, and Whitby. The lantern, a powerful triple oxy-hydrogen, with mixed jet, was lent by the treasurer, and the slides were passed through by the secretary.

The following were the awards of the judges, Messrs. A. R. Dresser, J. Traill Taylor, and Leon Warnerke (honorary member of the Society, a former member of council of the old South London):—

Class A—For best general work—(1) W. Rice, silver medal; (2) T. C. Kirby, bronze medal.

Class B—For best six pictures taken at the Society's excursions—(1) J. F. Kelly, silver medal; (2) H. E. Farmer, bronze medal.

Class C—For the best set of six local views—F. W. Webb, bronze medal.

Class D—For the best series of lantern slides—(1) W. Rice, disqualified by award Class A; (2) H. E. Farmer, disqualified by award Class B; (3) E. Boydell, bronze medal.

The hon. secretary also contributed a large frame of lantern slides, many of which slides were meritorious.

Some of the slides were from photographs taken with the Society's 12 by 10 camera, completely fitted, which is hired out to members.

The best general collection shown, but not for competition, was that of the president, Mr. F. W. Edwards, and consisted of photographs of silver shields and plaques, large landscapes and other views, and copies of old engravings, together with the beautiful transparencies which have already been distinguished at the Crystal Palace. Dr. Munyard was also an exhibitor whose works were not in competition.

Among the limited display of apparatus, Mr. H. Ransom showed his new ground glass focussing screen. The glass is finely ground, perfectly flat, and has a transparent spot in the centre which, while not interfering with focussing for views, forms a base over which an eye-piece may be placed, thus enabling the photographer to convert his camera into a telescope.

ASTRONOMICAL TELESCOPES.*

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

Before speaking of the enormous instruments of the present day, with their various forms and complicated machinery, it will be well to give some little time to a consideration of the principles involved in the construction of the telescope, the manner in which it assists the eye to perceive distant objects, and, in a brief and general way, to the construction and action of the eye as far as it affects the use of the telescope, all as a help to consider in which way we may hope to still further increase our sense of vision.

* A lecture delivered at the Royal Institution.

I will ask you to bear with me when I mention some things that are very well known, but which, if brought to mind, may render the subject much more easy. Within pretty narrow limits the principles involved in the construction of the telescope are the same, whatever form it ultimately assumes. I will take as an illustration the telescope before me, which has served for the finder to a large astronomical telescope, and of which it is really a model. On examination we find that it has, in common with all refracting telescopes, a large lens at one end and several smaller ones at the other; the number of these small lenses varies according to the purpose for which we use the telescope. Taking out this large lens, we find that it is made of two pieces of glass; but as this has been done for a purpose to be presently explained which does not affect the principle, we will disregard this, and consider it only as a simple convex lens, to the more important properties of which I wish first of all particularly to draw your attention, leaving the construction of telescopes to be dealt with later on.

Stated shortly, such a lens has the power of refracting or bending the rays of light that fall upon it; while they are passing through the lens the course they take is altered; if we allow the light from a star to fall upon the lens, the whole of the parallel rays coming from the star on to the front surface are brought by this bending action to a point at some constant distance behind, and can be seen as a point of light by placing there a flat screen of any kind that will intercept the light. For all distant objects the distance at which the crossing of the rays takes place is the same. It depends entirely on the substance of the lens and the curvature we give to the surfaces, and not at all upon the aperture or width of the lens. The brightness only of the picture of the star depends upon the size of the lens, as that determines the amount of light it gathers together. If, instead of one star, we have three or four stars together, we will find that this lens will deal with the light from each star just as it did with the light of the first one, and just in proportion to the angular distance they are apart in the sky, so will the pictures we see of them be apart on our screen. So if we let the light from the moon fall on our lens, all the light from the various parts of the moon's surface will act like the separate stars, and produce a picture of the whole moon—in the photographic camera the lens produces in this manner a picture of objects in front of it, and this picture we see on the ground glass. When we attempt to get pictures of near objects that do not send rays of light that are parallel, we find that as the rays of light from them do not fall on the lens at the same angle to the axis, the picture is formed further away from the lens. The nearer the object whose picture we wish to throw upon the screen is to the lens, the further the screen must be moved. If we try this experiment we shall find, when we have the object at the same distance as the screen, the picture is then of the same size as the object, and the distance of the screen from the lens is twice that which we have found as the focal length; on bringing the object still nearer the lens, we find we must move the screen further and further away, until when the object is at the focus the picture is formed at an infinite distance away, or, what is more to our purpose, the rays of light from an object at the focus of a convex lens after passing through the lens are parallel, exactly as we have seen such parallel rays falling on the glass come to a focus, and this holds good in other cases where we take the effect of reflection as well as refraction.

We can also produce pictures by means of bright concave surfaces acting by reflection on the light falling upon them. Such a mirror or concave reflecting surface as I have here will behave exactly as the lens, excepting, of course, that it will form the picture in front instead of behind. The bending of the rays in the case of the convex lens is convergent, or towards the axis, for all parallel rays; if we use the reverse form of lens—that is, one thicker at the edge than in the middle—we find the reverse effect on the parallel rays; they will now be divergent, or bend away from the axis; and so with reflecting surfaces, if we make the concavity of our mirror less and less, till it ceases and we have a plane, we shall get no effect on the parallel rays of light except a change of direction after reflection. If we go beyond this and make the surface convex, we shall then have practically the same effect on the reflected rays as that given to the refracted ray by the concave glass lens.

As regards the size of the picture produced by lenses or mirrors of different focal length, the picture is larger just as the focal length is greater, and the angular dimension is converted into a linear one on the screen in due proportion. Now, as we shall assume that the eye sees all things best at the distance of about nine inches, we may say that the picture taken with a lens of this focal length gives at once the proper and most natural representation we can possibly have of anything at which we can look. Such a picture of a landscape, if placed before the eye at the distance of nine inches, would exactly cover the real landscape point for point all over. A picture taken with a lens of shorter focal length, say four inches, will give a picture as true in all the details as the larger one, but if this picture is looked at at nine inches distance, it is not a true representation of what we see; in order to make it so, we must look at it with a lens or magnifier. With a larger picture one can look at this at the proper distance, which always is the focal distance of the lens with which it was obtained, when we will see everything in the natural angular position that we have in the first case.

But if, instead of looking at this larger picture, which we may consider taken with a lens of, say, 90 inches focal length, at a distance of 90 inches, we look at it at a distance of 9 inches, we have practically destroyed it as a picture by reducing the distance at which we are viewing it, and we have converted it into what is, for that particular landscape, a telescopic picture; we see it, not from the point at which it was taken, but just as if we were at one-tenth of the distance from the particular part that we examine. A telescope with a magnifying power of ten would enable us to see the landscape just as we see it in the photograph when we examine it in the way I have mentioned.

Having thus seen how a lens or mirror acts, we will turn our attention to the eye. Here we find an optical combination of lenses that act together in the same way as the single convex lens of which we have been speaking. We will call this combination the lens of the eye. It produces a picture of distant objects which, in the normal eye, falls exactly in focus upon the retina. We are conscious that we do see clearly at all distances beyond about 9 inches. *(To be continued.)*

PHOTOGRAVURE is drawing the attention of Indian amateurs.

THE PROGRESS OF PHOTOGRAPHY.*

BY SIR RICHARD WEBSTER, M.P., ATTORNEY-GENERAL.

The progress of photography can be traced step by step in the records of the Society of Arts. The year 1839 was signalised by the discoveries of Daguerre, viz., that a highly-polished silver plate could be rendered sufficiently sensitive to the effect of light to retain the image or impression refracted upon it. In 1847 we find M. Claudet reading a paper on the Daguerreotype process before the Society. He had then recently propounded the theory, which later researches in connection with electricity are thought by some to go far to verify, that the principal agent in photography was an emanation from the sun, something which is not light, nor yet heat, and he had to admit that the most skilful operator was only an empiric who obtained his results without knowing their cause. M. Claudet seemed to have arrived at the conclusion that no increase in the rapidity of photographic processes was required, and that if we could find a substance which permitted an exposure of half the time —I may mention that a Daguerreotype portrait could then be taken in about twenty seconds—it would be desirable to use a lens which would operate with half the speed. As a matter of fact he was not very far wrong, having regard to the conditions under which he was working.

Later on in the year 1852 Roger Fenton read a paper shortly after the Society had held its first exhibition of photographs (which exhibition, I may note, resulted in the formation of the Photographic Society), and in that paper Fenton spoke of the collodion negative as the *ne plus ultra* of photographic excellence. The application of this phrase to a process which is now, to a large extent at least, obsolete, shows how slow we should be to apply such a term to any known scientific process. Though Mr. Fenton seemed to be satisfied with what we should now consider the very limited power then placed at the command of the photographer, he had a sufficiently clear notion of what might be done in the future. He suggested the application of photography to astronomy—an interesting prophecy, now that the heavens are being so elaborately mapped by photographic means—and to the microscope, and he quoted, as an instance of the application of photography to scientific and geographical research, the fact that photographic apparatus had been supplied to the Arctic expedition under Sir Edward Belcher, and to another exploring expedition sent into the South Pacific under Captain Denham. In the following year, 1853, Mr. Kingsley described before the Society a method of photographing microscopic objects on a large scale, which, though considered at the time a great development, would now be regarded both as clumsy and inefficient. From that time down to the present we have had continual reference to the progress of photography, and descriptions of its various applications, until of late years we find its present condition admirably described in the papers and lectures given by Captain Abney, Mr. Bolas, Mr. Burton, Mr. Spiller, and others.

Nor is it to pure photography, apart from its applications, that this observation applies. The first practical method of producing a printing-block by photographic means, Pretsch's process of photo-galvanography, was described here by the inventor in 1865, and in 1869 Mr. Davenport predicted that at no remote period engraving, like miniature painting, would, owing to the progress of photography, become practically obsolete. If this prediction has not been realised as regards engraving proper, it has very nearly been fulfilled as regards wood-engraving, which has been seriously affected as a profession by the various photographic processes on which illustrated journalism is now so largely dependent. We shall look forward with much pleasure to the latest information on this subject in the paper promised us by Mr. Carmichael Thomas on "Illustrated Journalism."

Few speculations possess more interest than that of the probability of our succeeding in the production of photographic pictures in their true or local colours. For more than half a century this problem has engaged the attention of many experimenters, although originally pronounced to be an illusion by so great an authority as M. Biot. In February, 1840, Sir John Herschel succeeded in procuring upon photographic paper a coloured image of the solar spectrum, and he regarded this result as bringing near the hope that coloured photographs might be obtained. In 1857 Robert Hunt, the well-known pioneer in scientific photography, detailed various experiments in which he had obtained pictures of the spectrum by means of Daguerreotype tablets, prepared in a peculiar way with iodine, on which he stated that the colours had softness and brilliancy. Daguerre himself had remarked that, when he had been taking the picture of any red-brick or any painted building, the photograph assumed a tint of that character. From these facts Robert Hunt expressed the opinion that the possibility of our being able to produce coloured photographs was decided—the probability brought infinitely nearer; and he alludes in the same publication to some experiments of M. Niepce de St. Victor, which, when first produced, were alleged to be perfectly coloured. I am not sufficiently in the secrets of those who have recently been in active pursuit of the same object to express any opinion as to whether or not these hopes are much nearer fulfilment, but if rumour be correct, we shall, before long, have an announcement of great progress in the same direction; and I trust that the members of the Society of Arts will have an opportunity of themselves judging of the processes by which those results have been achieved.

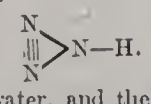
It is, moreover, interesting to note that the subsequent theories of Clerk Maxwell with regard to electricity, and the experiments of Professor Oliver Lodge and Sir Archibald Campbell, may verify the somewhat crude suggestions of M. Claudet as to the real agency which operates in producing a photographic image.

* A portion of the Presidential Address to the Society of Arts last week.

The Photographic Club.—The subject for discussion on December 3rd will be "Collodio-Bromide Processes;" December 10th, "Experiences with Hydrokinone."

Wilson's Photographic Magazine for November contains about the best photograph of the Daguerre Memorial at Washington yet published, and the more one sees of that memorial, the worse it looks. The young woman carved in front thereof, with her stiff wooden legs, chignon, and other prominent characteristics, is, presumably, intended to represent Fame.

A New Gas, Azothydric Acid.—Prof. Curtius, of Kiel, has obtained a compound, N_3H, for which he proposes the constitutional formula—



It is very soluble in water, and the solution dissolves zinc, copper, and iron, with evolution of hydrogen and the formation of nitrides, in which the metals are substituted for the hydrogen set free.—*Chemical News.*

Notes.

Perhaps nothing more illustrates the power of mind over matter than the commercial influences which result for generations from the utterances of poets. Had Scott never written of seeing "fair Melrose aright" and of the grave of Michael Scott, to what extent would the number of hotel-keepers now in the adjacent village have been reduced? Likewise, had Byron not written of Chillon, where would now have been the desecrating electric railway carrying visitors from Vevey to its gates? The Castle of Manfred has had the same glamour of poesie thrown over it, attracting thereunto the photographic amateur who, otherwise, would intelligently have let it alone, because of its unsuitable foreground, and being too high above any possible level of the lens to yield a picture artistic on its own merits. Such is the situation of the Castle of Unspunnen, of which Byron wrote:—

> You red cloud, which rests
> On Eigher's pinnacle so rested then—
> So like that it might be the same; the wind
> Was faint and gusty, and the mountain snows
> Began to glitter with the climbing moon.
> Count Manfred was as now within his tower,
> How occupied we knew not, but with him
> The sole companion of his wanderings
> And watchings—her whom of all earthly things
> That lived, the only thing he seemed to love—
> As he, indeed, by blood was bound to do,
> The lady Astarte.

An amateur recently sent a negative of Manfred's Castle to a commercial firm to enlarge on bromide paper, and one of their intelligent workmen seems to have been operating on negatives by the dozen, and pushing all of them for the same times into the same dish preparatory to leaving, in a few minutes, for his Saturday half-holiday. A nice, flat print, with lights and shades approaching the same density, was the result, the negative being thin and full of detail, so requiring different treatment to that given to average images. The irascible amateur, having made smaller but much better prints himself, said to the firm, "Why is this thus?" and sent some of his own results. The attention of the superior authorities being thus drawn to the matter, they resolved to return a decent enlargement, but took their revenge out of the amateur by writing sarcastically on the wrapper enclosing the returned negative their instructions to their particular workman: "*Replace*, and see that same brilliancy is obtained as in contacts. *Never mind them being chalky.*" The amateur, however, having obtained what he required, was satisfied, and, as said at the end of novels, they all were happy ever afterwards, and had large families.

French opinion about the ugly Daguerre monument at Washington is of interest. The *Moniteur de la Photographie*, after quoting our recent remarks about the monument, says:—"In publishing the preceding extracts we nevertheless recognise the respect paid by the United States to one of our illustrious countrymen, to one of the fathers of photography. We are among those who believe that Daguerre was but the outcome of Nicéphore Niépce. It may, however, be asked whether, without the discoveries of Daguerre, photography would now have arrived at its actual position. We owe to the kindness of M. Schwier, of Weimar, the block of the accompanying engraving representing the monument erected to Daguerre at Washington. The design is in effect sad, disgraceful, but that is of little moment; the work of the committee at Washington none the less deserves our gratitude. We need not look at the outer form, but can attach ourselves to the spirit of the act. We have not waited for the authority of the committee at Washington to print a picture of this monument, being convinced that giving increased publication to its work will have its entire approbation."

Lantern slides produced by the diazotype process, with gelatine as the vehicle, have a long range of gradation and are full of fine detail, but are of gorgeous colours as compared with ordinary lantern plates; therefore, for most subjects, not so pleasing in effect. A delicate emerald green colour has recently been obtained by special development; the green appears in the early stage of the development of a blue picture, so we suppose that some of the yellow compound sensitive to light is then unacted upon by the developer, and the mixture of blue and yellow produces the green. If so, these green prints are unstable.

The Company which was formed many months ago to take the portraits of any of her Majesty's subjects who could be persuaded to forego their customary penny-in-the-slot chocolate or butter Scotch in favour of photography, have not as yet made any great installation of their patent machines; and although it has been stated that such machines are in use, we have not yet had a chance of contributing the sum of one penny; for, truth to tell, we do not know where they are. However, we wish the Company every success in its endeavour to still more popularise our already popular art. But unless the Company looks sharp and takes possession of all the best sites for their operations, they will be eclipsed by a new device of the same kind, which has been contrived in America, and which is sure to make its way across the Atlantic if it is as successful in operation as it is said to be.

It is, of course, only natural that an American invention should altogether outstrip its English prototype; but at present we can only refer to promises, not performances, for the patent is not yet complete. A pretty full description of the contrivance, however, is published in that excellent periodical, the *Scientific American*, and from this description we can get a good idea of what the new device is expected to do. Its grandest feature seems to be that it will work quite independently of daylight, for paucity of light is the initial difficulty with which the English machines—at any rate, those placed in London—will have to contend. At the moment of exposure a charge of magnesium is ignited by an incandescent platinum wire, and the sitter is photographed by flash-light.

The incandescent wire savours of electricity, and, as a matter of fact, the whole of the necessary movements, after the impetus is given by the falliug coin, are carried through by the electric current. The sitter takes his place after having dropped a quarter dollar into the slot, and he theu gives a slight pull to a cord in front of the case. This uncaps the lens, and causes the magnesium flash to take place, and in two and a-half minutes the finished photograph, on a little sheet of flexible celluloid, is preseuted to him. The celluloid, it appears, is carried through the developing and fixing fluids by means of rubber tapes, and "the necessary chemicals are each supplied separately, from an air-tight reservoir, and the flow regulated by a dial apparatus to correspond with the temperature of the atmosphere and the strength of the chemicals."

This last sentence, which we have quoted literally from the published description, will cause a flutter of expectation in the bosoms of those amateurs who like to photograph with the least trouble to themselves. We have heard of gentlemen of this description who do absolutely nothing towards the production of their pictures but selecting the view and uncapping the lens. The mere mechanical work of developing and priuting is carried out by professional hands, and pictures produced in this manner, we are told, have actually more than once taken a medal at an amateur exhibition. Now, if these easy-going amateurs can only secure this marvellous dial apparatus described above, to correspond with the temperature, &c., they will be still more happy. But, perhaps, perfect bliss will not be attained until someone else invents an automatic device which shall select the view and uncap the lens for them.

The balloon, just now, is a subject of great anxiety to military authorities on the Continent. It is strongly suspected by the German War Office that enterprising French balloonists are in the habit of hovering over certain forts on the frontier, and taking photographs of the defences. The difficulty which the commanding officers of the forts in question are in is, that they don't know whether to fire at the balloon or not. If they do take this course, the result would certainly be fatal for the daring aeronaut, and if it should happen that no evidence of his suspected photographic work were discovered, it might prove rather awkward for the commandant. He probably knows sufficient of photography to be certain that only on the negatives taken being developed would any proof or not of the supposed spy be forthcoming, and as in all probability the apparatus and the plates would be smashed when the balloon came in contact with the earth, one feels that the experiment is rather risky.

Mrs. Fawcett is probably a student of physiognomy, or may be she has been studying Mr. Francis Galton's composite photographs of criminals. In a lecture she delivered last week on General Booth's scheme, she thought there was a process of selection which would weed out drunken, lazy, and half-witted individuals, and that photography might be employed in getting to know bad and unsatisfactory characters. This is all which is reported of Mrs. Fawcett's words on the subject, and we certainly should like to know a little more about her views. How is photography to be employed? Will it be necessary to take what Mr. Galton would call a type of face, and compare with it people of supposed demoralised character, or is the camera to be used to take photographs of such persons, so that they may be studied at leisure, and traits of character discovered which, invisible to the naked eye, are revealed by photography?

The ingenuity of photographers is limitless. Hundreds, nay thousands, of persons have noticed the effect when standing between two mirrors, that their reflections are multiplied infinitely. A clever photographer, M. Paboudjian, of Constantinople, has succeeded in photographing this curious multiplication of a single face, and a reproduction of one of his photographs appears in *La Nature*. To obtain this photograph, Mr. Paboudjian took two glasses placed parallel to one another, and separated by about sixty centimetres. In the space between the two glasses he placed the subject to be photographed; and the difficulty he had to solve was how to take the photograph without being seen one's self with the apparatus. This was easily managed by one of the glasses being shorter than the other, and by placing the apparatus on the top of the shorter one, a little inclined towards the floor. The glasses must be unframed, for the frames being reflected would give a very bad effect.

The experiment may be made more complicated by three large glasses placed in the form of a prism, reflecting sides beiug turned inwards; three or four persons are posed in the interior, thus giving the impression of an enormous crowd. A similar effect may be seen just now at the Royal Aquarium, Westminster, where, with only two or three persons, quite the impression of an enormous throng moving to and fro in a garden is produced by a series of mirrors. The illusion is really a very pretty one, but whether the idea is taken from M. Paboudjian's photographs we are unable to say.

It is to be hoped that Mr. Alcott, the naturalist on board the Indian Marine Survey steamer *Investigator*, is also a photographer. This steamer left Bombay on the 18th of October, and in the course of its dredging operations brought up some large prawns. One night, a prawn lying in a bucket of sea-water on deck was observed to be shining brightly, and when seized gave out such a volume of phosphorescence that by its light Mr. Alcott was able to see the details of the interior of the bucket and his own hands. Here was a splendid chance for securing photographic evidence of this luminosity. The light probably might not have been sufficiently sensitive to have taken a photograph of the prawn itself, but it certainly would have secured an impression of the phosphorescence.

AMERICAN AMATEURS' EXPENSES IN PHOTOGRAPHY.

BY CATHERINE WEED BARNES.

How many people know much, if anything, of the expense required to manage an ordinary portrait studio? Does the average sitter consider that a dozen sittings cost the operator any more than one? I speak not only to the amateur, but to the general public, in saying that there is much unconscious ignorance on these and other points in photography which a few words may serve to make clearer. I am often asked if it is not possible to clean an exposed plate so as to use it again, and as regards proofs or prints, they are usually considered as of little, if any, value. It seems to be a positive revelation to one who is not familiar with photographic processes to be told that every sheet of paper must be silvered, and requires pure gold to tone and render the picture permanent; that simple printing will not do this. One very important point is, that the ordinary sheet of silvered paper is 18 by 22 inches. Calculate how many cabinet pictures can be cut from it, and also how much has to be wasted if larger sizes are desired; unless, indeed, one follows the example of some photographers, and cuts the wrong way of the paper, making the long faces broad and the latter still broader. This simple explanation will account for many so-called "poor" pictures. It is usual with professionals to silver every day what paper they estimate will be needed, and, if any is left over, or there is a sudden change in the weather of long-continued dark days, there is a deficit when the books are reckoned up. The general public finds it also hard to understand why, if a negative can be made in stormy weather, it is impossible to make albumen prints.

Many amateurs are deterred from any but the simplest work because some one else has a finer lens, and "of course, there is no use in my trying to do such work," is the ready excuse for careless manipulation, leaving the lens uncovered, wiping the glass with any cloth that happens to be at hand, working with soiled graduates or trays, and generally neglecting the absolutely important rules of neatness and order. Lenses are made now at prices to suit any purse, but it is well to make up one's mind first what kind of work is to be done. It is utterly impossible to make ordinary portraits, landscapes, groups, large heads, interiors, and snap-shots with the same lens. I have done quite good work with a 4 by 5 lens—camera and lens costing twenty dollars—but only outdoors and in the best of light. Do not, in such cases, ask for absolutely sharp outlines clear to the corners, or a soft, well-lit face with everything in focus. Of course, an expensive lens is best for the best work, else why should men spend so much care in devising them? but it is not necessary that an amateur should attempt to cover the whole photographic field. It is much better to select some particular branch, and learn to do that as well as possible. The cheapest work is that done with a small view lens, and using such cameras as the Kodak, Turnover, P. D. Q., &c. I do not think the film rolls have really helped the art side of photography, for, with so many chances to work quickly, one is tempted to make many useless exposures, and not take time to thoroughly study the view before exposure. I was in California once with a friend who had a kodak camera, and he must have made six or seven pictures to my one, but his were two and a-half inches, and mine 5 by 7 in size. His camera had cost twenty-five dollars, and mine, an Anthony "Climax," nearly one hundred and forty dollars. His was always ready and no weight, while mine was heavy, and required much trouble in filling holders and packing exposed plates. I had used a R. R. Dallmeyer lens (6½ by 8½), and, though the results were smaller in quantity, I was not ashamed of them in quality.

The lens is the first thing to be considered as regards expense, for the camera and tripod can be home-made. So, where expense is an important consideration, get as good a lens as you can afford, and fill up the deficiencies in your outfit with brains. My first outfit (5 by 8) cost less than thirty dollars, but, as my great ambition was interior work, I soon disposed of it for an 8 by 10 camera and a fine wide-angle lens, of course at a much greater expense, the latter costing over sixty dollars. As this worked more slowly than my long-focus lens, it was not possible to use it for portraits, which was my next temptation. So a hundred-dollar portrait lens was bought and did very well, using only side light, but added experience made me critical, and then my attic studio was built. Before this, an ordinary view camera on a tripod had been used for portraits, but with the studio a regular portrait camera and stand were needed. Then, as ambition grew, a lens for large heads was required, which cost 164 dollars, and all sorts of accessories. The room being short and full-length, figures being called for, a wide-angle group lens joined the collection. This, being expected to do fine work, was expensive, costing nearly ninety dollars, and when I found certain work could not be done with the lenses on hand, I looked for what would do it. I do not believe in straining a lens, and would prefer buying one rather larger than is actually required. But lenses, and good ones too, are becoming more reasonable in price, and I have one now, a W. A. Euryscope (Voigtländer) covering a 5 by 7 plate with full opening and an 8 by 10 with the smallest stop. Certain kinds of lenses do special work better than others, and I do not believe in pinning one's faith to any one make, although confessing my preference for Voigtländer's and Dallmeyer's for portraits and interiors.

There are several good ones for instantaneous work, but I have had best success with the Dallmeyer and Hermagis. It is curious that one person will succeed where another fails with the same lens or developer. Try for yourself, and decide which is your "particular vanity." If possible, test your lens before buying one; no two, even of the same make, are exactly alike, no matter who tells you so. But the main point settled, then comes the camera, and early in camera work I learned one very useful "point." If you have more than one camera, screw your flange on the front-board of the smallest, and slip that board, when necessary to use a larger plate, tightly into a frame on the larger front-board. By this device one lens can be used on several cameras. One reason for using high-priced lenses is, that often several of the same make fit into the same flange, rendering only one front-board necessary. Tourists will appreciate this necessity for travelling close-reefed. In my reducing camera I use for 8 by 10 negatives a wide-angled Dallmeyer, and for 11 by 14 a R. S. Ross lens. In the former case, put the lens inside the camera, and in the latter put it in the sliding front-board. I have a 5 by 7 Universal camera, and usually carry a 6½ by 8½ Dallmeyer R. R. lens with Prosch shutter, and into the same flange fits a 10 by 12 Dallmeyer W. A. With this outfit it is

possible, with separate front-boards, to carry a 5 by 7 Dallmeyer W. A. and also a Voigtländer W. A. Euryscope, which has a longer focus than my small Dallmeyer; but circumstances govern cases, and it is not generally necessary to take four lenses on short trips. This fitting one front-board on another I utilise for the studio, for interiors, and landscapes. It is especially useful when using a drop shutter, and I have the Green, Low, and Prosch shutters; the first two are not expensive, and are quick enough for the studio, but not for view work. The Prosch is the most expensive, and the quickest for closely accurate work.

As regards cameras, they can cost comparatively nothing, or a great deal. For portraits they should be heavy and rigid, with sliding front, double swing-back, and every other movement which can be devised to secure uncertain sitters. Remember, however, that this means added expense. The stand should be firm and easily controlled. My two portrait cameras cost about one hundred dollars, and my stands, for there are two, cost respectively fifteen dollars and twenty-five dollars. Tripods are comparatively inexpensive, but should be thoroughly trustworthy, and one can well bear an extra weight in outdoor work if sure they will not suddenly give way and bring wreck and ruin in their path. In truth, there is too much demand nowadays for light outfits, while strength and solidity are being sacrificed. People want a good picture, but without its costing them much expense, time, or trouble, and they will not get it.

In studio work one needs backgrounds and various other articles, and the expense of these is limited only by the condition of the operator's purse. Those who have studios are always altering them, as I can testify, and the more one learns, the more chances offer themselves for such alterations.

The landscape worker is spared this, and his expenses must be in the line of plates, lenses, and chemicals. Plates cost all sorts of prices, increasing, of course, with the larger sizes. There is not much difference between those of a size. Cut films are somewhat more costly, but have many advantages, more so, I believe, than the film rolls, while 4 by 5 plates cost about sixy-five cents per dozen; 8 by 10's, 2.40 dollars; 11 by 14's, 5 dollars, and so upwards. Considering the possible risk of defective plates and uneasy sitters, plates are quite a heavy item of expense, especially with weak negatives, when to the cost of development is added that of intensification. With portraits comes the expense of retouching, which ought only to be done by an experienced worker, and this requires a long and severe apprenticeship, besides good eyesight, a steady hand, and endless patience. It should not be attempted by the average amateur, and never done on interiors or landscapes unless under very exceptioual circumstances.

A good negative becomes such only by development with certain chemicals, and their names and combinations are legion. The simpler formulæ are the best, unless you wish to show what you *can* do, and if you get a good one do not change quickly. Pyro costs about six dollars per pound, and both carbonate and sulphite of soda are cheap. There is no better developer for portraits than this combination, while for lantern slides I use eikonogen, which is growing cheaper, in place of pyro, with, generally, sulphite of soda and bromide of potassium. The new acid sulphite is excellent for keeping the pyro bath clear, and can easily be made by Lanier's formula. T. C. Roche uses it in the pyro developer, but I have not tried that. A little sulphuric acid in the alum bath is also a cheap and easy way to clear negatives and slides. It is claimed that one should not use acid with eikonogen, but I have no trouble with it. —*The American Amateur Photographer.*

PHOTO-CHEMICAL INVESTIGATIONS.*

BY FERDINAND HURTER, PH.D., AND V. C. DRIFFIELD.

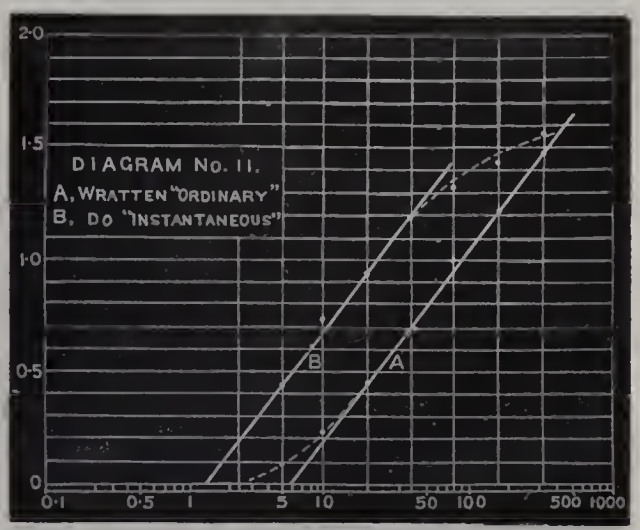
THERE is a theoretical possibility that a plate may be rapid to one developer and slow to another, so as to require different exposures according to the developer used. If silver bromide be reduced to metallic silver, 22,700 units of heat must be supplied to replace the heat of combination. Of this amount of heat, the developer in the act of development supplies a portion. Ferrous oxalate, for instance, would probably supply 12,900 units, so that the light need only supply the difference, viz.,9,800 units. But if another developer could supply more than 12,900 units, then the light clearly need not supply quite so much, and, in that case, the plate would be faster to one developer than to another.

We have not paid such close attention to this question yet as to enable us to decide it finally, but, as far as our experiments have gone, we have found very little difference, if any, between the various developers, and we do not feel justified in assigning to the small differences we have observed any great importance.

If a developer could be found which would render a plate materially faster, that developer would strike a serious blow at the hypothesis that the latent image consists of sub-bromide of silver.

We append a number of interesting diagrams representing our graphic method of determining the inertia of a plate.

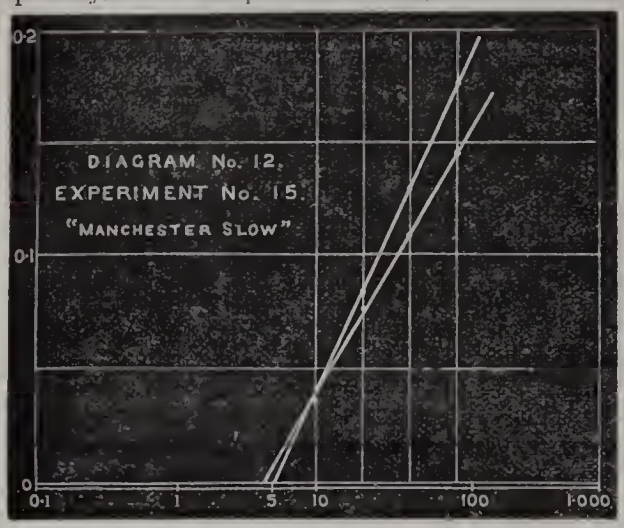
Diagram No. 11 shows the general arrangement we adopt for finding graphically the value of the inertia. An ordinary "slide rule" furnishes the mode of subdividing the scale, the distances of the numbers being proportional to their logarithms. The two curves are the curves of



Wratten and Wainwright "ordinary" and "instantaneous" plates. It will be noticed that the "instantaneous" plate shows, within the given exposures, a portion of the period of over-exposure, whilst the "ordinary" shows a portion of the period of "under-exposure." The inertia of the one is 1·4, that of the other 5·5, and, in round numbers, the one plate is four times as fast as the other.

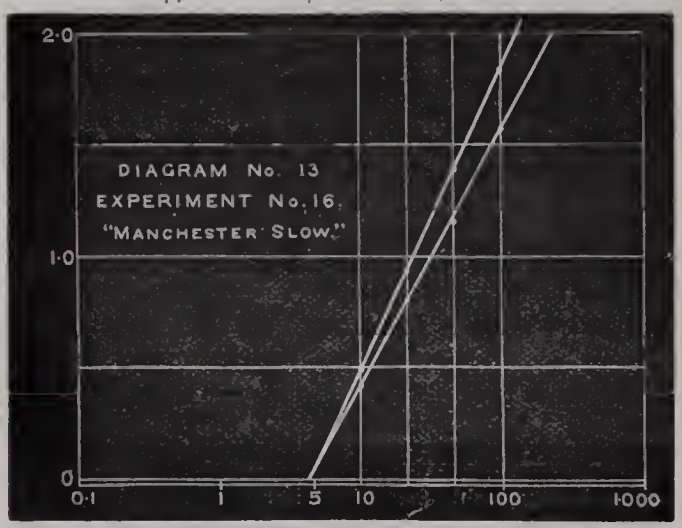
* Concluded from p. 842.

Diagram No. 12 shows the results of experiment 15 graphically, for the purpose of showing that variations in

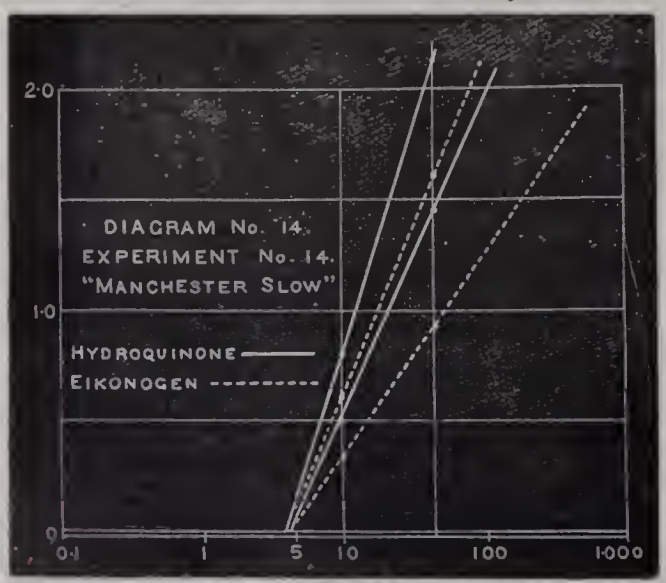


the mode of development do not influence the determination of the inertia, the densities of the two modes of development being different; yet the straight lines practically converge to the same point.

Diagram No. 13.—This diagram represents another variation in pyro development, viz., in the amount of



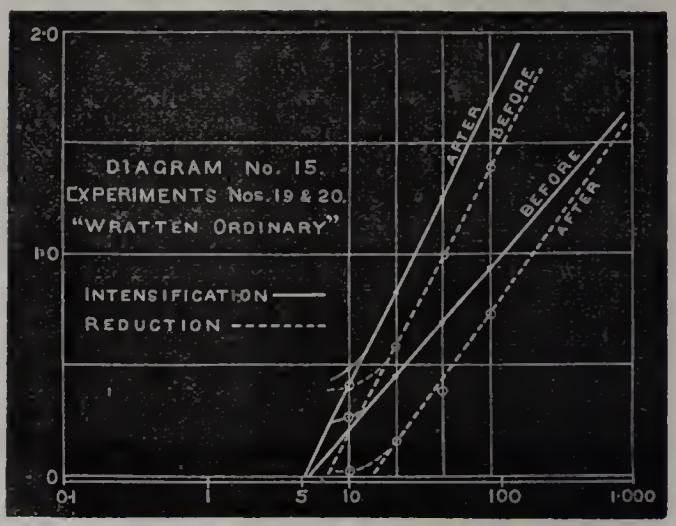
bromide (experiment 16). It will be again seen that the values of the inertia are almost identical, in spite of a con-



siderable difference in the composition of the developer and the time of development.

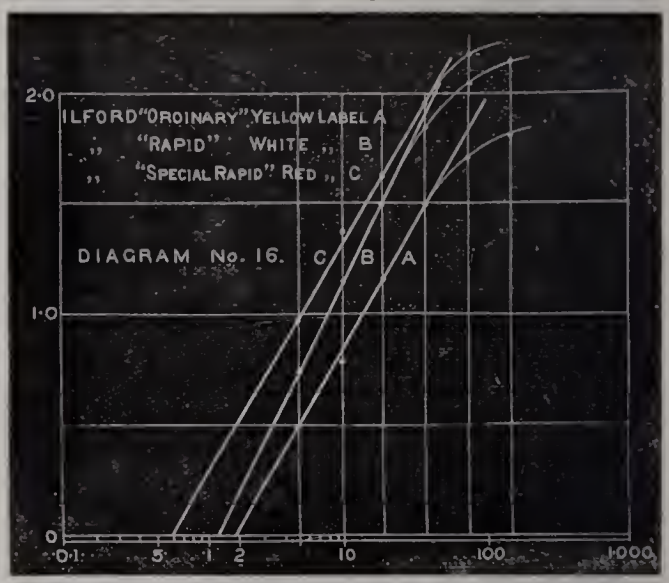
Diagram No. 14 shows four determinations of the inertia of one plate (see experiment 14), two determinations being made with eikonogen and two with hydroquinone, the duration of development being different for each determination; yet the results of all four determinations are practically identical.

Diagram No. 15 shows that the inertia of a plate can be determined after intensification, *but not after reduction*. It



is, therefore, better to develop too little rather than too much. We clearly must not resort to reduction, but we may intensify if the trial plates have been under-developed. (Experiments 19 and 20.)

Diagram No. 16 shows the determination of inertia of the Ilford plates, "ordinary," "rapid" and "special rapid" (red label). Their inertias are respectively 2·0, 1·4, and 0·56, and their speeds are relatively as



1 : : 1·41 : 3·5. The "red label" plates are the most rapid plates we have so far investigated, but we found it very difficult to ascertain their true speed in the camera, on account of the difficulty in securing adequate density.

When the inertia of the plate is known, it is possible to time the exposures in the camera so that the densities of the gradations are almost exactly proportional to the logarithms of the light intensities which produced them. By this means negatives can be produced which satisfy very nearly the definition we gave of a theoretically perfect negative. It must be borne in mind, however, that such a negative is not necessarily true to nature. The optical density after development differs from the density

of the latent image. If the negative is to be true to nature, a plate must be used which is richly coated, the exposure must be carefully timed, and the development must be carried only so far that the value of the development constant γ is numerically equal to 1. Experiments which we have made indicate that for the production of artistic effects on ordinary silver chloride paper, it is necessary to exaggerate the densities, *i.e.*, to prolong the development until γ is greater than 1, and nearly reaches the value 2. This requires further investigation; suffice it to have pointed out that what Captain Abney terms "photographic untruth" is not necessarily inherent in photography, since the photographer has it in his power to decide the degree of exaggeration.

The exposure to be given in the camera can be found by means of the actinograph. when the inertia of the plate is known.

The "actinograph speed" of the plate is found by means of the formula $S = 34\,i$, where S is the speed and i the inertia in candlemeter seconds. We find, for instance, the speed of the Ilford plates from their inertia (as shown on Diagram 16).

		Speed.
Ilford "ordinary"	$= \frac{34}{2}$	$= 17$
Ilford "rapid"	$= \frac{34}{1\cdot01}$	$= 24$
Ilford "special rapid"	$= \frac{34}{0\cdot56}$	$= 60$

This method of referring the sensitiveness of the plate to the candlemeter second as unit will, we believe, greatly promote progress both in the preparation of the plates and in their application. We flatter ourselves that we have supplied one of the greatest needs of plate makers and photographers in general, by enabling them, for the first time, to ascertain accurately the sensitiveness of different plates, and, by means of the actinograph, to apply this information in practice.

The above is the main practical result which has accrued from our investigations, but identically we have shown the fallacy of many popular views on the subject of development, and the paramount importance of correct exposure.

From a purely scientific point of view, perhaps, the most interesting result of our labour is the elucidation of the numerical relation between the exposure and its effect on the sensitive film, and the simple explanation of these relations, based upon the optical properties of the unexposed sensitive film. It would not have been difficult to extend these considerations so as to include in them the reversing action of the less refrangible rays. This would not, however, have served any practical end at present, and it would have complicated the formulæ very considerably. We reserve for a future communication this extension of the law which we have discovered.

THE LANTERN SOCIETY.—On Monday, November 24th, at an exhibition of lantern slides for members and their friends, a selection of about ninety slides was shown on the screen, and several lantern attachments were then shown practically, in operation; namely, the kaleidoscope, pandiscope, cycloidotrope, and vertical attachment. The curious effects capable of being produced by some of these instruments appeared to be somewhat in the nature of a revelation to many of those present.

GELATINE IN PLACE OF GLASS FOR STEREOSCOPIC SLIDES.*

BY CAPT. KISS.

I HAVE already detailed my experience in the preparation of stereoscopic slides on glass plates. In spite, however, of their unquestionable advantages, they have two great faults; they are heavy, and easily broken. If, in order to decrease the weight, the thinnest possible glass is selected, the fragility is increased; if thick glass is used, the weight becomes enormous. These evils stand in the way of the production of stereoscopic slides on glass. Who buys when travelling, an occasion when—at least it is so with me—money is more freely spent than at home, these heavy, unportable pictures? Very few, even when they are to be found in commerce; but in order that their preparation may be profitable to the photographer such rare sales are insufficient. I have, therefore, recently occupied myself with experiments having for their end the replacement of glass by gelatine, and have obtained some very gratifying results, even if the process cannot be considered quite perfected. For the preparation of gelatine stereo-transparencies I employ the same chloride of silver gelatine emulsion as when working on glass; but instead of coating it on plain glass it is poured upon the cleaned, and not too finely ground, side of ground glass. These plates are first thoroughly cleaned by washing. The matt side must appear quite even, without lighter spots, greasy patches, or finger-marks. The plates are then well rubbed on the matt side with talc by means of a linen cloth, and then thoroughly dusted with a soft brush. A linen cloth is then moistened with alcohol of ninety-six per cent., and the edges of the plates are cleaned with it so that the talc is removed to form a border of 7 to 8 mm. (about one-third of an inch).

The coating of plates thus prepared is certainly somewhat more difficult than ordinary, for the emulsion does not flow smoothly on the talced surface, but with the pipette formerly described it goes, after a little practice, very well. The emulsion is poured on in pretty good quantity, about 12 cm. for a plate of 10 by 18 cm. In drying, the use of warm air must be avoided.

Upon these plates, as with glass stereograms, the picture is produced by contact printing and development. The developed plates are washed and placed in an acidified chrome alum solution of two per cent. After drying and retouching the border is cut round, and the film with the picture easily removed. The film is matt on the side which was next the glass to the same extent as was the glass plate itself; the other side bears the picture. Gelatine films obtained in this way are naturally very thin, about the one-fifteenth of a mm. They can, however, easily be strengthened by the process given in *Eder's Ausführliches Handbuch der Photographie*, on page 345 of the third part, 1890 edition. The collodion coating may be omitted, and the plate, warmed to blood heat, coated direct with 20 cm. of a ten per cent. gelatine solution to which some glycerine has been added. For spreading the solution upon the levelled plate, a brush of about 25 mm. (about an inch) in width dipped in warm water, and then pressed out, serves exceedingly well.

If the negative has been divided, as in printing glass stereograms, so that the prints are in their proper positions and do not require to be transposed, the film is cut with sharp scissors to the stereoscopic size, and is laid between

* Translated for the PHOTOGRAPHIC NEWS from *The Photographisches Wochenblatt*.

two films of commercial sheet gelatine, and these again between two thick paper mounts, such as are generally used for coloured paper stereograms. The whole is cemented together, and we have a gelatine stereogram which, viewed as a transparency, resembles a glass stereogram, but is neither so fragile nor so heavy. If either of the protecting gelatine films should suffer damage it can easily be replaced. The picture film lies protected between two other films, and, except by violence, can scarcely be damaged.

If the negative has not been divided, the picture film must be cut and the corners cemented with wax to one of the protecting gelatine films; the other film is then laid upon it, and the whole enclosed between the two paper mounts.

If the picture film, without strengthening, is placed between the two transparent sheets of gelatine, the operation is simplified to that extent. My own collection of stereograms is prepared with the strengthened films laid between two paper mounts with no further protection. This is certainly not a complete safeguard, but, with careful treatment, films thus prepared will last a long time.

THE PLATINOTYPE PROCESS.*

BY JOHN PIKE.

I INTEND merely to give a brief description of the process, for there are certain points which deserve notice, and I am wishful also to enlarge somewhat the scope of the title, and refer to platinum toning generally. Most of the older photographic text-books contained formulæ for platinum toning, designed, I imagine, for use with ordinary albumenised paper. Personally, I never met with any success whatever with such formulæ. The error, or failure, arose from using the chloride of platinum, or chloro-platinic acid, as some prefer to call it; but with platinic nitrate or sulphate a successful toning bath may be made, and this bath was introduced so far back as 1859. It is noteworthy that the gentleman who devised this formula also used chloro-platinite of *sodium*, a salt closely analagons to the platinum toning salt in use at the present time. The same gentleman, Mr. Burnett, also at nearly the same period recommended, as developers of the images formed by his ferric and uranium printing processes, salts of gold, *platinum*, and palladium; and here we have foreshadowed many years ago the platinotype process of the preseut day.

No member of our Society should forget the share taken in experiments of this kind fifty years ago by Sir John Herschel, the distinguished relative of our own distinguished late president. The fact that the action of light reduced the ferric salts to the ferrous was one of the earliest known in photographic chemistry. It was also known that the ferr*ous* compounds would throw down gold and silver from their soluble salts, while the ferr*ic* salts would *not*. Sir John Herschel was aware of this, and devised his chrysotype process. In this process paper was washed over with a solution of a salt of iron, dried, and exposed; it was then toned with a solution of gold chloride, made as neutral as possible, and a picture obtained formed of *purple oxide of gold*. If for gold we substitute platinum, we do not get a precipitate; and here we come to the experiments of Willis, who discovered that the addition of a *soluble oxalate* would cause such a precipitate. Willis also used a platin*ous* salt, viz., the chloro-platinite of potassium, and was enabled thus to get a double deposition of platinum.

The method of obtaining prints by Willis's process depends, firstly, on the fact that ferr*ic* oxalate is reduced by the action of light to ferrous oxalate; secondly, that the ferrous oxalate, when dissolved in a hot solution of potassic oxalate, instantly reduces the metallic platinum from chlorides and other salts, more particularly when in the platinous state; for instance, a solution of a platinous salt—*i.e.*, the chloro-platinite of potassium—is mixed with one of ferr*ic*-oxalate. A properly sized and prepared paper is floated upon this solution and carefully dried; on exposure to light the *iron* salt is affected, being changed to ferrous oxalate, and the particles of this salt will be in close contact with those of the platinum salt. Float this paper upon a hot solution of potassic oxalate; the ferrous image is at once dissolved by the potash salt, but at the moment of solution is reduced also *in situ* some or all of the *platinum*, and the result is a picture in pure *platinum* black. This, the hot-bath process, Mr. Auty will demonstrate first. The advantages of this process of Willis's are the replacing of all the iron salt by one of platinum, and not forming an alloy with that metal; the disadvantages are the faintly visible appearance of the picture during printing, and the numerous precautions to be observed against damp.

So far we have been getting nothing but black tones; hence farther experiments to meet the desires of those who were wishful for the warm tones of the silver print. With the matt surface of the platinotype the Platinotype Company issued a special solution to be added to the hot bath for the production of sepia tones. This solution is believed to contain a salt of mercury, probably the chloride.

In the cold-bath process, which we also propose to demonstrate, Willis's paper is coated with a solution of ferric oxalate and a small quantity of mercury salt; on exposure to light the ferric salt is reduced as before to the ferr*ous* state. The exposed prints are developed—or, rather, toned—in a cold solution of potassic oxalate, say 50 grains to the ounce, to which has been added 6 or 8 grains to the ounce of chloro-platinite of potassium (the toning salt of the Platinotype Company). With a strong solution of oxalate of potash *cold* tones are obtained; with a weak solution warm tones. There are some advantages claimed for the use of cold-bath paper. Prints made by this method are more transparent in the shadows. This may be because the toning is produced by *application*, so to speak, of the platinum salt to the surface of the paper, and not precipitated in the body of the paper, as in the hot bath method. Another important characteristic is the greater purity of the *whites;* this is because the paper is coated with iron only.

The developed prints are placed *at once* in a bath of acidified water, one part of hydrochloric acid to fifty of water, for ten minutes, and then transferred to a second and third acid bath, by which time all traces of *iron* should be removed; a final wash in clean water follows, and this completes the operations.

You will observe that the cold-bath platinum method is essentially a toning process, and by all accounts it admits of many modifications and various ways of application. My own work is generally done by floating. The solution may be applied by means of a brush or flannel roller, or a spray producer may be used.

* A communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.

So far we have been using paper and referriug to paper containing a basis of an iron salt; when we come to use silver we are able at once to secure a greater variety of tone, platinum being well known to form alloys with silver. Blanchard's paper has a basis of silver, and the other matt-surface papers sold for platinum toning are also sensitised on a silver bath. The name of Mr. Lyonel Clark is, of course, very intimately associated with fine work in this direction, and priuts prepared by his method are, iu my opinion, a distinct advance in photographic work. Mr. Clark recommends home-prepared sensitised paper, and some pithy remarks of his on the relative merits of ready-sensitised and home-prepared aud selected paper are well worth quoting. He says:—"With the advantages that ready-made paper brings, it has also its concomitant disadvautages; we are more or less bound to one quality of paper, slightly thicker or slightly thinner in substance, perhaps, or of a more or less hideous tint, but still always the saiue texture or surface, and ou this are indiscriminiately printed the bold outlines of large heads, or grand landscapes, or the exquisite details of stereoscopic work, or the micrographical fidelity of nature's minutest organisms."

Mr. Clark therefore suggests wisely that the paper be selected to fit the subject, and it naturally follows that the tone or colour should also be obtained which more accurately represents the idea to be carried out. I am glad to say our Society has not been altogether behind-hand in experiments with Lyonel Clark's processes aud methods. Mr. Parry, Mr. Sawyer, and Mr. Goold have all, I believe, followed the lines laid down, though I am not sure that platinum has been in all cases in the toning salt used. Possibly one or all of these gentlemen will, if present, favour us by remarks on this subject.

In conclusion, let me remark that years ago, on the walls of our exhibitions were to be seen nothing but the glossy surface of the prints and warm tones; now-a-days we seem to have fallen into the opposite extreme of all matt-surface papers and *cold tones*. Abolish the albumen surface if you will, but let us at least show some idea and sense of fitness in the matter of colour, and remember that variety is pleasing.

THE JURY OF THE NEXT INTERNATIONAL EXHIBITION AT VIENNA.

A Vienna correspondent writes that sooner than was anticipated, the jury of this exhibition has been formed. Hitherto no photographic exhibition has been able to show a jury like this. Artists of the first rank, free from every prejudice, have declared themselves ready to join it and exercise the office, which is by no means free from trouble. By these means the exhibition acquires an importance unsuspected before. Englaud, it is to be hoped, will induce her best men to help to carry out the ideal ou which the exhibition is founded; this is all the more to be hoped because, probably, she is destined to take the highest place there. A few words may be added as to each member of the jury.

Henry von Augeli—Professor at the Imperial and Royal Academy of Fine Arts, Vienna, a celebrated painter whose name is as well known iu England as on the Continent.

John Benk—A sculptor renowned for his sculptures for the House of Parliament, for his Clythia, and other works.

Julius Berger—Professor at the Imperial aud Royal Academy of Arts in Vienna; a great master, who is now engaged in executing a commission to decorate the walls and ceiling of the Historical Art Museum with frescoes.

K. Karger—Professor at the School of Art Industry, Vienna. Recently the city of Vienna entrusted him with the difficult task of painting, for the new Town Hall, a picture representing the *Corpus Christi* procession, and containing portraits of the Emperor and a great number of those about him.

Augustus Schæffer—Director of the Imperial Picture Gallery, Vienna, who, in his own department—landscape paintiug—enjoys a reputation not inferior to that of the others.

Fritz Luckardt—Professor, to whom was given the task of selecting the members of the jury, and whose efforts have succeeded in iuducing the celebrated artists here named to agree to serve. He has declared his readiness to take part in the labours of the jury as a photographic expert, and to draw up its report.

Literary Notices.

Sun Artists. No. V. (*London: Kegan Paul, Trench, Trubner and Co., October.* 1890.)

This is, perhaps, the most interesting number of the excellent periodical, *Sun Artists*, yet issued, for it contains photogravure reproductions of four of the best pictures produced by Mrs. Cameron, the founder of what is now unfortunately called the "Naturalistic" school of photography. In gazing at these beautiful photographs, it seems strange that critics should have existed who showered public abuse upon her head for their production. Mrs. Cameron, however, took no notice of the vulgar outcry, and reviled not in her turn. She was too cultured and refined to indulge in more than silence or gentle speech about her worst adversaries, a moral characteristic which stamps a great mind.

Sun Artists also contains an essay, relating to Mrs. Cameron and her work, written by Dr. P. H. Emerson, from which we learn that Julia Margaret Pattle, daughter of an Indian civil servant, was born in Calcutta on June 11th, 1815. Her father was a Scotchman, and her mother French. In 1837 she married Mr. Charles Hay Cameron, successor to Lord Macaulay as fourth Member of Council of Calcutta. In 1860, some years after their return to England, Mr. and Mrs. Cameron settled at Freshwater Bay, and here Mrs. Cameron found in photography an all-absorbing pursuit. One of the portraits she took here was that of her neighbour, Mr. Alfred Tennyson, a photogravure reproduction of which forms one of the four illustrations which are accompanied by the essay. Another is a splendid portrait, artistically excellent and technically faulty, of Sir John Herschel, which will be valued not alone for its high order of merit, but in remembrance of the work of Herschel as one of the greatest pioneers of photography in its early days. The other two illustrations are "The Kiss of Peace" and "The Day Dream."

Mrs. Cameron's first out-of-focus portrait was a "fluke," as she called it, but, with deep original insight unfettered by man-made conventionality, she saw a beauty therein invisible to the many, so thereafter pursued intentionally a course which had been initiated by accident.

Mrs. Cameron died in Ceylon in 1878. Her photographic period of production extended over ten years, 1865 to 1875.

Patent Intelligence.

Applications for Letters Patent.

18,067. C. CUSWORTH, Eagle House, Leytonstone, "Photographic Shutter."—November 10th.

18,081. R. KRUGENER, 46, Southampton Buildings, London, "Changing Cases."—November 10th.

18,120. R. G. MASON, 24, Clapham Park Road, Loudon, "Lanteru Microscopes."—November 11th.

18,168. C. MONTI, 323, High Holborn, London, "Photographic Shutters."—Novemher 11th.

18,181. W. PALMER, 47, Liucoln's Inn Fields, London, "Cameras."—Novemher 11th.

18,213. C. BECK, 23, Southamptou Buildings, Loudou, "Cameras."—November 12th.

18,238. C. LAWRENCE, 141, Fulham Palace Road, London, "Camera Guns."—November 12th.

18,363. E. R. FLETCHER aud D. A. CROMBIE, 1, Quality Court, London, "Binder and Mask for Lanteiu Slides."—Novemher 14th.

18,403. E. S. MILLER, 11, Bath Road, Bedford Park, Chiswick, "Photographic Shutter."—November 15th.

18,410. W. WATSON, 70, Welliugtou Street, Glasgow, "Photographic Background."—November 15th.

Specifications Published.

12,232. *August 5th*, 1890.—"Improvements in Photographic Apparatus." WILLIAM EDWIN SCHNEIDER, 422, Ninth Street, N.W., Washington, Columbia, United States of America, Manufacturer.

This patent cannot be adequately described without the aid of diagrams. It contains twenty-six claims.

Correspondence.

THE UNNATURALNESS OF NATURALISTIC FOCUSSING AND LONG FOCUS LENSES FOR PORTRAITURE.

SIR,—Mr. W. H. Wheeler points out what was an accidental omission in my paper on "The Unnaturalness of Naturalistic Focussiug." The sentence should read, "If I take a full-length figure on a quarter-plate with, say, a 7-inch focus lens, I can get the accessories and background defined to an extent that is sufficient. Why, then, if I use a lens of double the length of focus *for an image of double the size on a whole-plate*, and a stop of the same proportiou or rapidity, cau I not get the same amount of general focus as in the former case?" The words in italics, which—or the equivalent of which—I intended to include in the sentence as representing the question actually put, were inadvertently omitted, and I am thankful to have the omission pointed out so that I can take the earliest opportunity for correcting it.

I certainly did not iutend to imply an objection to the use of long focus lenses for portraiture. I have, indeed, both practised aud advocated for this purpose and for copying, the use of as long focus a lens for a given size of plate or scale of picture as the circumstances will permit, aud this not only for the reasons mentioned by Mr. Wheeler, but on account of the curvature of field acting so much more injuriously as the focus is short in proportion to the size of the plate.

The choice of focal leugth for a given size of image which we have in copying and portraiture—limited, however, by the length of the studio, aud sometimes by atmospheric conditions—does not generally exist with regard to other subjects, whether landscape, architectural, or interior.

When we have once decided on the amount of subject to be included, and the best available standpoint—and generally speakiug, a change of standpoint involves a change in the scene itself—we have no longer any choice, but must use a lens of some particular focus for any given size of image.

I aun glad to have Mr. Wheeler with me in advocating the necessity for usiug very small stops to obtain really good definition all over a large plate, and am not surprised to find that he would go farther iu this directiou thau I have iudicated in my paper. The curvature of field that has been referred to, and the desirability of recognising the capacity of the eye for adjustment to various focal planes, would indicate a still greater limitation of the size of the diaphragm, but I did not wish to introduce matters upon which a reasonable argument could be produced on the other side, and the main issue thereby obscured; and, therefore, as waiviug the adjustment argument still left aunple basis for the refutation of the "uaturalistic" conteutiou, I was content in the paper to go no farther than I did.

Mr. Wheeler's views ou the relation of the physiological and psychical processes of uatural visiou to the impressiouist theory would, I am sure, be of great interest and commaud considerable attcution at the preseut time, and I trust that he may be prevailed upon to lay theun before your readers whilst the subject is so much to the front. W. E. DEBENHAM.

London, November 17th.

THE CLUB OF AMATEUR PHOTOGRAPHERS AT VIENNA.

SIR,—Appended I have the pleasure of giving you a list of the gentlemeu who will form the jury at the International Photographic Exhibitiou to be held here next spriug.

H. von Angeli, Professor at the Imperial and Royal Academy of Fine Arts, Vienna, Painter.

J. Benk, Sculptor.

J. Berger, Professor at the Imperial and Royal Academy of Fine Arts, Vienna, Painter.

K. Karger, Professor at the Art Industrial School at the Austrian Museum, Painter.

F. Luckardt, Professor, Imperial Couucillor, Photographer to His Imperial aud Royal Majesty, the Emperor.

A. Schaeffer, Director of the Imperial Picture Gallery at Vienna, Painter. CHARLES SRNA, *President.*

November 16th, 1890.

DIAZOTYPE PRINTING PROCESSES.

SIR,—In your article headed "Primuline Printing Processes," in the issue of this journal of November 14th, you have fallen into an error which we take the liberty of pointing out. Feer's process is not a primuline process, although it is a diazotype process. The author of the article, Dr. Witt, connects them iu the latter aspect only, as may be seen by refereuce to the origiual article.

Feer's method depends upon the sensitiveness of a class of compounds known as the diazosulphonates, which result from the interaction of diazo compounds with the alkaline bisulphites. By the action of the light there uudergoes a decomposition, by which the diazo group is set free, and in the presence of an amine or phenol (the developer), re-acts with these to form colouring matters. In this case the light is the colour-producing agent. In the primuline process the diazo derivative is destroyed by the light—which, therefore, becomes a colour destroying agent.

The one is therefore a "negative"; the other—*i.e.*, the primuline process is a "positive" method.

GREEN, CROSS, and BEVAN.

4, *New Court, Lincoln's Inn, W.C., November 24th.*

DR. KASSLER, of Breslau, has discovered a new method of obtainiug oxygeu. Water is poured upon a mixture of peroxide of bariuu and ferricyanide of potash, and oxygen is giveu off. The oxygen thus obtained is said to be of great purity.

EIKONOGEN.—Au article by M. Georges Robert, in *Le Progrès Photographique* just received, says that M. Pétry, of Bar-sur-Seine, has made known that powdered eikonogen can be preserved by mixing with it a small proportion of powdered bisulphite of potash. M. Robert raises the question whether the latter salt is present in recent samples of eikonogen sent from Germany.

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the technical meeting of this Society held on the 25th inst., the chair was taken by Mr. W. BEDFORD.

Mr. CHAPMAN JONES noted an assertion that had been made to the effect that strong hydrochloric acid reduced the strength of platinum prints. In one quarter it was stated that the sepia prints were particularly affected in this way; whilst the Platinotype Company made that statement with respect to the black prints. He (Mr. Chapman Jones) did not think that any solution of platinum took place, but that if there was a change of colour, it was analogous to what occurred in a negative when treated with acid, and no one inferred a solvent action in that case.

The CHAIRMAN enquired whether it could be stated with certainty what was the difference between the deposit on a sepia and on a black toned platinum print.

Mr. CHAPMAN JONES said that Mr. Willis considered that the sepia deposit was due to an oxide of platinum, but he (Mr. Chapman Jones) did not think that possible. As to the method of securing a sepia-toned image, that was supposed to be a secret, but if cupric chloride or mercuric chloride were added to the platinum solution before coating the paper with it, the sepia effect was produced. As little as one part of mercuric chloride to 500 of the solution was sufficient to produce a very marked effect. The change of colour produced by hydrochloric acid upon a negative was so great that two photographers unacquainted with each other had informed him that that was their regular way of reducing intensity, and that they were obliged to be careful not to carry the action too far, or the negative would be made too thin.

The CHAIRMAN said that the reduciug effect of acid upon a negative only showed itself where there was colour in the deposit. With a grey deposit, such as was obtained with sulphite in the developer, no reduction resulted from the use of acid.

Mr. MACKIE said that he could uot find any effect of changing the colour of deposit to result from the additiou of sulphite to the developer for collodio-bromide plates. If slides of the characteristic red colour were treated with acid, would the colour be thereby altered?

Mr. A. COWAN said that in some cases the colour would not be at all altered. Even treatment with perchloride of iron did not effect much change of colour.

Negatives and prints sent by Col. Waterhouse to illustrate the process for producing reversed images, of which a description had been sent to the Society for the last ordinary meeting, were then laid on the table. The plate treated with bichromate in addition to thiosinamine added to the eikonogen developer, was much more complete in reversal than that in which the bichromate had not been used. The plate developed with phenyl thiocarbamide was also complete in reversal.

The CHAIRMAN said that some time ago he had tried the process introduced by Mr. T. Bolas for obtaining a reversed image, in which the plate was treated with bichromate, and then, after a suitable exposure, developed with iron. He had never succeeded quite to his mind, and had not obtained clearer images than in the examples now shown.

Mr. W. H. HARRISON observed that Captain Abney had stated that the presence of an oxidising agent in the film made it easy to obtain a reversed image. He had some years since endeavoured to obtain thiosinamine, thinking that it should be useful in development, but could not get it. The nearest he could get would be to order sinamine from Germany, and complete the manufacture of the thiosinamine himself. He therefore had abandoned the idea. With regard to coal-tar dyes, a paper had been read not long since by Professor Hummel, of Leeds, in order to do away with the prevailing impression of their very fugitive character. He had, indeed, found many of them fade, but not in greater proportion than those of other origin. Eosine colours were particularly evanescent, as proved by results exhibited by Professor Hummel.

THE CAMERA CLUB.

ON Thursday, November 20th, Mr. ANDREW PRINGLE gave an address on "Some Old Processes of Making Lantern Slides." Mr. H. M. ELDER, M.A., occupied the chair.

Before the lecture, Count PRIMOLI, of Rome, handed round a large and excellent series of instantaneous photographs and larger work of his own production. An exceptionally interesting one represented an indoor function with the Pope seated in full ceremony. This had been given ten seconds' exposure; the figures during the time had not moved. Count Primoli has made over 30,000 exposures in the last two years or so, and sets his photographic account for that period at £2,000.

Mr. PRINGLE commenced by gainsaying assertions to the effect that lantern slide pictures did not come within the domain of art. He insisted on a high scale of lighting, clear shadows, and warmth of colour. He sportively suggested that the screen pictures could easily be made as naturalistic or as definite as the spectator liked by varying his distance from the sheet, and if rough surface was the aim, then all that had to be done was to use a good fuzzy travelling rug as a screen. He then proceeded to give the formula, working details, and distinctive characteristics of several old processes, dry collodion, wet collodion, and collodio-albumen, and he illustrated his remarks by exhibitiug on the screen comparative slides by the several processes. Most of his remarks related to the production of washed collodio-bromide emulsion plates without a preservative, and to the old collodio-bromide process with a preservative.

Mr. HUSSEY said that the collodio-bromide plates gave better results than gelatine plates, for the latter tended to yield hard shadows, due, he thought, to the appreciable thickness of the gelatine film. He thought the best varnish for slides to be shellac dissolved in alcohol.

Mr. W. ENGLAND stated that in the rapid gelatino-chloride plates the gelatine is so thin that the results are as good as with collodion plates, and that the images are quite clear in the shadows. A solution of seed-lac is better than a solutiou of shellac.

Mr. J. B. B. WELLINGTON remarked that if the glass plates be cleaned with a weak solution of gelatine and hydrochloric acid the films will not slip off in the developing or other operations.

Mr. HUMPHERY said that the collodio-bromide process is easy when a large number of plates is prepared at one time.

Mr. F. de P. CEMBRANO had found the chief difficulty in the collodio-bromide process to be the obtaining of a suitable cotton. Mr. Wellington's plan of cleaning plates sometimes resulted in spots. Mr. Brooks did not like hypo for fixing collodio-bromide slides, and preferred weak cyanide of potassium; the plates required less washing afterwards.

Mr. PRINGLE thought that there was no necessity for obtaining "bunged-up" shadows with gelatine, but the tendency was that way; with under-exposure and over-development the shadows were sure to be blocked. The use of mineral acids for cleaning plates was dangerous; a trace of chrome alum in the gelatine might answer as well as hydrochloric acid. Failures were often caused by impurities in the bromides used in making emulsions; when bromide of zinc is used it must be dry. His experience was that the stronger the developer, the less easy it is to get warm tones.

On Thursday, December 4th, Mr. Henry Sturmey will read a paper on "Rollable Transparent Films."

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

ON Tuesday, the 18th inst., the monthly meeting was held in the Mosley Street Café, Newcastle, Mr. J. P. GIBSON in the chair. The subject for the evening was a demonstration of the platinotype process by Messrs. M. Auty and J. Pike.

Mr. PIKE then read a paper on "The Platinotype Process" (see page 932).

Mr. AUTY demonstrated the hot-bath process, developing a large number of prints in view of the members.

Mr. PIKE afterwards showed the working of the cold-bath

process, and referred especially to its greater range of tones as compared with the older method.

The HON. SECRETARY announced that over £15 had been subscribed by the members towards the purchase of a new optical lantern for the Association.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 20th.—Mr. F. A. BRIDGE in the chair. Mr. George was elected a member of the Association. On the subject of collodio-bromide, Mr. J. NESBIT said that he had had considerable experience with this emulsion, and in his opinion it was the easiest and best of all the processes for making lantern slides.

Mr. TEAPE had been using an intensifier from a formula published by Mr. H. Farmer:—

Ferricyanide	¼ ounce
Uranium	¼ ,,
Water	1 pint

using one dram of this solution to 10 ounces of water. He found that if the plate after intensification was washed for four or five hours, the density would be considerably reduced. This raised a question in his mind as to the action of the ferricyanide and uranium on the silver image. He read an extract from Mr. H. Farmer's "Notes" on this subject as follows—"The metallic silver reduces the potassium ferricyanide to ferrocyanide, and with the potassium ferrocyanide uranium forms an insoluble double cyanide which becomes precipitated on the image." This, Mr. Teape said, did not agree with his experience.

Mr. W. E. DEBENHAM, for reducing purposes, originally used ozone bleach and chrome alum: he now gave preference to the following formula:—

Sat. sol. chloride lime	3 parts
Sat. sol. common alum	1 part

Mr. TEAPE said he had been successful with the following:-

Bichromate of potash	1 dram
Sulphuric acid	1 ,,
Water	4 ounces

using 2 drams to 1 ounce of water.

THE BRIXTON AND CLAPHAM CAMERA CLUB.

ON November 20th, Mr. A. R. DRESSER demonstrated the process of "Slide Making," exposing and developing a number of plates from various members' negatives. The printing-in of clouds by vignetting was fully explained and shown, also methods of local development and reduction. This being a popular subject, an interesting discussion followed. A copy of Mr. Dresser's pamphlet on the subject was laid upon the table, together with samples of Wormald's slide masks and binding strips.

At the next meeting, on Dec. 4th, a paper will be read by Mr. E. J. Wall.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held in the Rooms, 180, West Regent Street, on November 17th, the president, Mr. ARCHD. WATSON, in the chair. After the election of twelve new members, a paper on "The Development of Negatives" was read by Mr. W. GOODWIN, followed by a discussion.

A number of transparencies by Mr. Miller, illustrating a tour in Holland with the hand-camera, was shown on the screen by means of the limelight lantern. These were followed by a number of other transparencies by various members.

J. F. SASCHE.—A letter to you, somewhat fully addressed, has been returned by the American postal authorities, with the remark that the name of the "Post Office" was not stated. The papers were posted to you.

A LARGE envelope with an American postage stamp on it has been received by us, with the remark by the London postal authorities that it had been found without contents in a London pillar box.

Answers to Correspondents.

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

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

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

ANXIOUS ONE (Kendal).—Observing our answer to you last week, the Fry Manufacturing Company have written to say that the article you are in search of is described at page 12 of their trade catalogue; and Messrs. Appleton and Co., of Manningham Lane, Bradford, are prepared to supply Eastman's transferrotype paper.

C. J. K.—*Spots on Unmounted Prints.* The cause of these white spots is often very perplexing. There is no dark nucleus, such as would indicate metallic particles in the paper reducing the silver nitrate, neither are they due to hypo splashes on the finished print, as was at first supposed. Are they caused by some impurity taken up from a blotting pad, or do you use chloride of lime for washing the hands, in which case a touch might injure the prints? Our material is exhausted, so we cannot make any more experiments. We found the prints had been thoroughly well washed.

J. E. D.—*Royal Academy Pictures*, 1890. Under this title a series of reproductions was published by Messrs. Cassell and Co. in three monthly parts, forming a kind of supplement to the *Magazine of Art*. The original price was one shilling each, but owing to the great demand they were soon out of print, and are now only procurable, if at all, at an advanced price. Thanks for your second letter duly received.

F. B.—*Borax in Fixing and Toning Baths.* 1. We can see no objection to the use of borax in the fixing bath to maintain alkaline conditions, and it may even prove superior to ammonia as a remedy against blisters. 2. As regards the use of this salt in the toning bath, and its need for renewal, you must remember that each successive addition of gold chloride destroys a certain amount of borax, so that the same solution cannot be used indefinitely; it must be changed occasionally, or fortified by the addition of a freshly made borax-gold bath.

H. H. (Richmond).—*Athletic Studies.* Enquire of Mr. Auty, of Newcastle, Messrs. Marsh Brothers, of Henley, and Mr. A. R. Dresser, of Bexley Heath. M. Lugardon, and Messrs. Hill and Saunders exhibited a fine series of vaulting figures some years ago; Mr. Muybridge also. Mr. F. M. Sutcliffe's "Water Rats" may show action enough for your purpose, likewise Mr. W. M. Malby's "Tug of War."

T. E. (Dover).—*Munktell's Paper.* We have often used the close-textured Swedish filtering paper bearing the name of Munktell, but never yet heard of a quality of paper suitable for photographic purposes being turned out by this firm. B. K. Rives is a well-known brand of starch glazed paper very suitable for albumenizing.

R. (Witham).—*Mercury Intensifier.* Use half a dram of hydrochloric acid per pint of saturated solution of mercury chloride. This prevents the formation of the chondrin compound, which by subsequent action of ammonia necessarily clouds the clearer portions of the picture. Like albumen locks up silver, so does gelatine the mercury, unless acid be added.

M. B.—*Meteorological Photographs.* Although not coming under the definition of "whirlwinds, tornadoes, or storms," your records of earthquake damage may be acceptable to the British Association Committee. At any rate, you might offer your photographs to Mr. Clayden, whose letter (with address) appeared last week.

HYDROGEN is greatly superior to coal-gas for lime light work, but there are conveniences in using the latter whenever the distance to be traversed happens to be great, and a sufficient supply of coal-gas can be had on the spot

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE DIAZOTYPE PROCESSES.

PERHAPS it is hardly recognised as yet what a considerable influence the diazotype processes may have upon photography with the lapse of time. They give a power of obtaining colour in direct photographic prints never before seen, and, in cases in which the particular developer chances not to be costly, they are usually rather inexpensive to work.

They naturally divide themselves into two great classes: in the one class positive prints are produced from negatives; in the other, positive prints are produced from positives.

The first of these classes—in which positive prints of colours varying according to the mode of preparation of the sensitive surface—is a printing-out system which was discovered by Dr. Adolf Feer, of Lorrach, and its principle, according to Dr. Vogel, is that "a positive paper picture can be obtained from a photographic negative with every diazo compound capable of forming a sulpho-acid, if brought together with sulphite of soda into aqueous solution. If paper be impregnated with this, adding at the same time an amine or phenol, and the dried papers be exposed to light, the sulpho-acids will return to their original compounds—free, simple, diazo compounds and sulphite of soda. The free diazo compounds form now with the amine or phenol present the desired azo colour. These pictures possess one defect; they are more on the inside of the paper than upon the surface, the solution applied having to be alkaline, and alkali attacks the size of the paper, thus allowing the penetrating of the liquid." Dr. Witt states that the azo bodies are capable of producing about two thousand colouring agents, from which we deduce that the proportion thereof likely to be utilisable in photographic work will probably form a wide field for photographic research.

As regards the second of the classes, that discovered by Messrs. Green, Cross, and Bevan, about which much has been published in these pages, the colour obtained is likely to vary with every new developer as it is discovered; moreover, the operator is not limited to primuline as a starting point. Then, again, what are called "developers" in this process are not developers in the full sense of the term, for the images are previously visible, and what are now called "developers" produce the colours by chemical reactions. Should substances be found which will develop upon diazotised bodies photographic images previously invisible, another large field for photographic research will be opened.

According to Dr. Witt, the colours produced by these processes can be generally designated as "fast." We suppose dyers call certain colours fast because they will not move. Messrs. Green, Cross, and Bevan have found that some of the colours produced are so stable that the fabrics dyed by them will bear boiling in soap and water without fading. The influence of light upon them may be different, but such a great number of colouring compounds is obtainable by the process that, with time and experience, it will be possible to separate the stable from the unstable.

Just at the time when these remarkable methods of producing positives from positives have been born into the world, comes the discovery of Colonel Waterhouse, of a method of rapidly producing direct positives in the camera, and with short exposures. Some of his results were exhibited at the last meeting of the Photographic Society, and from among them a selection might have been made which would have answered well if employed to give diazotype pictures by direct printing.

The uses of azo compounds in orthochromatic photography have yet to be unveiled, but several good experimenters, who are also investigators, are engaged in the research.

These facts tend to show that fields of photographic research which it will take years to explore have just been opened.

SOCIETY OF CHEMICAL INDUSTRY (Liverpool Section).—The next meeting will be held in the theatre of the Chemical Laboratories, on Wednesday, Dec. 10, when the following papers will be read by Ferd. Hurter, Ph.D., and V. C. Driffield:—(1) "The Sector and Grease-spot Photometers and their Results"; (2) "The Relation between Photographic Negatives and Positives." Both papers will be illustrated by diagrams and experiments.

PHOTO-MICROGRAPHS.

The art of taking photographs of microscopic objects has of late years progressed with leaps and bounds, the advance being due to the large number of amateurs who have taken up this branch of work, to the introduction of improved apparatus to meet their wants, and more than all, perhaps, to the conveniences afforded by the gelatine dry plate. The application of photography to microscopic work is by no means new, although the term photo-micrography being freshly coined might lead some to suppose that it represents a new art. The new word became necessary because of the existence of those miniature photographs—now generally associated with ivory charms and toys—which had taken possession of the title "micro-photograph." To avoid ambiguity, the term *photo-micrograph* was invented to distinguish the enlarged photograph of a microscopic object from the photograph which had been taken from a large object by means of the instrument itself.

The opinions concerning the value of photo-micrographs for purposes of study have not always agreed, some observers advocating them, and others denouncing them as not being so serviceable as drawings. So recently as the beginning of the present year, in a paper read before the Natural History and Microscopical Society of Birmingham, the author went so far as to say that, "although photo-micrography is very popular as a means of transferring pictures of microscopic objects to lantern slides, painting is, in many respects, superior to it." In this case, the word "painting" was understood to mean the method of drawing with pencil and brush on ground glass which was introduced some years back by Dr. Dallinger. But the reasons given why a painted slide should be better than a photograph do not seem to us to be very convincing, for at their head this author states that a well-painted slide *looks* better than a photograph. This, surely, is a very poor reason to advance when the best means of studying an object is in question. Another reason given is that you cannot, in photographing an object, get every part of it in satisfactory focus at the same time. This is, of course, true of some objects, but that it is untrue of others is evidenced by the beautiful examples of photo-micrography which have been exhibited year after year at Pall Mall and elsewhere, and which have more than once met with acknowledgment at the hands of the judges.

Of course, photo-micrography, like everything else, has its disadvantages and imperfections, but we venture to say that drawings of microscopic objects have far more. To begin with, an artist, however skilful, cannot avoid impressing upon his work a certain amount of individuality. It is quite inseparable from his handywork, and he cannot help it, and is as necessary a part of it as the unconscious *character* which every man gives to his handwriting. Picture-dealing would be a lost art were it not for this unconscious mannerism on the part of an artist, which at once stamps his work with being his, and his only. But when this individuality is introduced into a picture of a microscopic object, where correct detail is the chief consideration, it becomes no longer an advantage, but a flaw. Another reason why drawings are untrustworthy is found in the fact that a skilled artist—*i.e.*, one who is used to drawing microscopic objects—will know what peculiarities a certain preparation should exhibit, and will be apt to draw according to preconceived notions rather than from what is actually before him. We need say little concerning the tiring of the eye by long examination during the making of such drawings, for it is obvious that this too is apt to lead to faulty results. We feel quite sure that if two or three skilled draughtsmen were instructed to draw a copy of any particular microscopic object, the resulting pictures would differ from one another to a great degree.

A photo-micrograph, as we know, is subject to none of these failings, but yet it has disadvantages which have given its opponents opportunities for speaking unkindly of it. Many of these having attempted to obtain photographs of stained specimens, and having failed to get good results, have at once placed on record the impotence of photography, without waiting for the antidote for this defect, which afterwards appeared in the form of colour-sensitive plates. Dr. Koch, whose name has lately been on everyone's lips in connection with his alleged cure for consumption, was the first to apply the photographic method to the delineation of Bacteria; and he employs, we understand, isochromatic plates, in conjunction with coloured screens for filtering the light. So high is his opinion of the value of photography for this work, that he considers that, under certain circumstances, a photograph is more valuable than the original object from which it was taken. For the truth is that no two observers see an object in the microscope in the same way, and consequently they draw different conclusions from it. A slight alteration in the focussing arrangements or in the lighting will make an object take to itself quite a different appearance, and thus faulty manipulation may easily lead to false records. A good negative of an object will, on the other hand, yield impressions which are all exactly alike, and details which it is difficult for different eyes to quarrel about.

Devon and Cornwall Camera Club.—The following particulars are forwarded respecting this Club, which possesses the facilities of a lecture hall, library, dark room, and studio in the Athenæum, Plymouth. The president is Mr. J. D. Pode, J.P.; the vice-presidents are Messrs. Robert Murray, C.E., and W. Gage Tweedy, B.A.; council—Major Robert Barrington-Baker, Messrs. David Roy, E. H. Micklewood, Chas. Aldridge, M.D., J. S. Hawker, J.P., S. Weekes, Mus.B., R. Hansford Worth, C.E., A. Reginald Norrington; the hon. secretary is Mr. Robert Burnard, 3, Hillsborough, Mannmead, Plymouth; hon. treasurer—Mr. Arthur A. Carnell, Bedford Villa, Plymouth. Frequent excursions are held during the summer, and in winter, meetings are held every alternate Monday for lantern displays, demonstrations, reading of papers, and discussions. There is a postal branch in connection with the Club. Two photographs are contributed four times a year. Medals and the album itself are offered as prizes on each occasion. The hon. secretary of this department is Mr. J. D. Pode, J.P., Slade, Ivy Bridge, S. Devon; the hon. critic and judge is Mr. Audrew Pringle, F.R.M.S.

THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT EDINBURGH.*

Among the various pieces of apparatus on view at the Exhibition, is a large camera made on American lines by Mr. McGhie, and Balwin's baby-holder. Mr. A. H. Band exhibits a detective camera of his own design, and a balance for weighing small quantities of chemicals rapidly. It is made on a steel-yard system, and has a sliding weight; it is mounted on a brass rod stand, and is a neat little instrument. Messrs. Duncan and Sons exhibit prints mounted on smooth paper. Messrs. Arundel and Marshall place on view parcel post tubes and boxes, for the enclosure and protection of goods, also light-tight metallic grooved boxes for plates.

Mr. J. T. Leighton's patent prize medal photographoscope, manufactured by Messrs. Perken, Son, and Rayment, is also on view, and is represented in the accompanying cut. The object of this invention is to provide a means of displaying photographs or other pictures, whereby the necessity for handling is avoided, and the deleterious effects of dust and exposure to the

atmosphere prevented. The pictures are entirely protected from damage by rubbing together, so destructive to valuable prints. The apparatus is neat in appearance, and the designs are suited for the drawing room or library, or for the studio or saloon of the photographer. While the old-fashioned album may be allowed to be on the table unopened and uncared for, this prominent apparatus at once attracts attention. By turning a small side knob or handle, the pictures appear one after the other in endless succession. The number of prints is limited only by the size of the apparatus.

One of the exhibits on view attracts much attention. It consists of the *Daily Graphic* original sketches of the railway accident near Taunton, the zinc block produced therefrom, the flexible stereotype mask taken from the block, and one of the curved stereotype castings as prepared to go upon the cylinder of the machine. All these were in Edinburgh within a day or two after the accident occurred, showing the rapidity with which newspaper work is carried on in these days.

* Continued from p. 902.

Some carbon transparencies of a greenish colour, half-plate size, by Mr. Andrew Swan Watson, form an attractive feature of the exhibition, and they are well mounted and illuminated for public inspection. They chiefly represent sky effects at Tyree, and include beautiful cloud and water effects.

Messrs. George Mason and Co. exhibit a new burnisher of French origin, fitted with apparatus to gauge the various thicknesses of mounts, and that, too, without loss of time. By means of a lever motion, each card is pinched, and its thickness at once indicated. Supposing the gauge to give the number seven, regulators at each end of the roller have to be set at number seven; the burnisher is then ready for use. It is heated by gas, and has a thermometer to show the temperature of the bar.

The same firm also exhibits an enlarging lantern with back as well as front bellows, to permit the light to be withdrawn to any given point. The half-plate lantern has an eight-inch condenser and an achromatic objective. The same firm also exhibits a camera screw with plumb attachment, to give all levels, and the photographer using it can see at once when his camera is level, or how much, and in what direction, it is inclined to the plane of the horizon.

Some good photographs upon wood-blocks, ready for use by the engraver, are placed on view by Mr. A. Nichol, who, however, does not state the method of their production.

In relation to the Kinnear cameras in the Exhibition, and all the world over, it may be of interest to our readers to know that Colonel Kinnear is a native of Edinburgh, and resides there still. He is an active amateur worker in photography still; he looks after all modern improvements, and works with films of the latest make.

Messrs. Wray and Sons exhibit, in a glass case, some of their well-known photographic lenses.

The absence of attendance at some of the stalls is a bar to obtaining information about some of the photographic apparatus on view in the Exhibition.

The photographs in the Exhibition will form the subject of later notices in these pages; meanwhile it may be stated that the display in Edinburgh equals any which has been seen in this country for many years, and is worth a journey of some little distance to inspect. From London and the midland districts the comparatively new route to Edinburgh by the Midland Railway passes through some picturesque districts of interest to photographers, although the beauty of the section between Carlisle and Settle has been grossly exaggerated in print. In Melrose and the surrounding district there is plenty of photographic work to be done. In the burying-ground adjoining Melrose Abbey is the tomb of Sir David Brewster, who gave much attention to photography and photographic optics in his day, and it bears the following inscription:—

"Sacred to the memory of Sir David Brewster, K. H., born 11th of December, 1781, died at Allerby 10th of February, 1868. Also of Dame Juliet Macpherson,

his beloved wife, who died at St. Andrews 27th of January, 1850, aged 63. Also of James Brewster, B.C.S., their eldest son, who died at Dheyrah Door, Bengal Presidency, 19th of November, 1851, aged 39. Also of Charles Macpherson Brewster, their second son, who was drowned in the Tweed 28th of June, 1828, aged 13. 'The Lord is my Light.'"

Literary Notices.

WILD LIFE ON A TIDAL WATER. By P. H. Emerson. Illustrated by P. H. Emerson and T. F. Goodall. (*London*, 1890: *Sampson Low, Marston, Searle, and Rivington.*)

THIS richly illustrated book contains many photo-etchings by Dr. Emerson, and one photo-etching from Mr. Goodall's large painting of Great Yarmouth, "The Last of the Ebb," exhibited at the Royal Academy of 1888. As regards Dr. Emerson's pictorial work therein, it is calculated to give pleasure to all observers, especially to those of an imaginative disposition, who can read sermons in stones, trace castles in the clouds, and see faces in the glowing coals. The photographs have a beauty of their own which all are likely to recognise, whether they approve or otherwise the tenets of the "school" in which Dr. Emerson holds so prominent a place. Recognition of one class of beauty by the observer does not necessarily imply incapacity to appreciate beauty of another class; there is one glory of the sun, and another of the moon, and occasionally abundance to admire in photographs sharp all over. There is also great force in the argument that photography should not always quit its own field of art, to imitate the methods of sculptors or painters.

Dr. Emerson has learnt photo-etching, and in future intends to etch his own plates; he has been experimenting with printing papers to see from which he can obtain the best results, and he has set up a press of his own. Printing from photo-etched plates is about the dirtiest and most troublesome work in which any man can engage, and if Dr. Emerson has enthusiasm enough to go on with this unpleasant part of the work, he should issue a photograph representing himself engaged in the act, with a full view of the palms of the hands and the apron.

Unfortunately, we cannot reproduce one of his etchings as an illustration of the high character of the work now under notice, but we quote the following piece of descriptive writing from the book, to show the literary genius and power of the author:—

DR. EMERSON AND THE CRABS.

'Twas a beautiful evening; the tide was ebbing, yet the water in our drain appeared quite smooth, although a warm, light, southerly breeze was blowing. The course of the drain was clearly defined by this smooth water-way. Indeed, this highway wandering past our door was marked out by lines of foam, outside of which the shallow water on the flats dauced in an endless turmoil of wavelets, shifting, glistening, shimmering, and moving restlessly in the soft sunshine. As the water cleared off the flats I hid myself behind a box on the stern of the house-boat to watch the green crabs, for they are very sharp-eyed. Already the weed had grown round our sides, and hung at low water in festoons from the slimy timbers. I had baited the mud at the water's edge with shrimps, and now awaited anxiously my guests. I had not long to wait; they soon came scrambling up the mud, and running in and out of the sea-weed hanging to the boat. I could hear their hard claws and bodies clattering on the planks. A few had gathered round the shrimps, but I picked out conspicuous groups for study. A duel on a lump of mud first attracted my attention. Two lusty crabs were fighting for a shrimp's tail. They placed four inches of mud between themselves, the happy possessor of the cause of war fighting on the defensive. He opened his claws wide apart, and brandished them in challenge. His opponent raised his right claw high in the air, rushing at his enemy with fiery onslaught. But the knight in possession stood firmly, crouching down on his hairy legs to receive the attack. They closed, and the clash of armour as their carapaces struck together was quite audible from my coign of vantage. Directly they closed the right-armed champion made a dive with his right claw and seized the piece of shrimp from beneath the maw of the crab in possession; but, after a little sparring, he dropped it and retired to the back of the ring preparatory for a second round. Again the right-handed knight made a valiant rush, but he was met by a fence which nearly toppled him into the mud. Then they closed and grappled with each other, but without apparent satisfaction to either warrier. This manœuvre was repeated several times, so the God above, who was getting bored, interfered, and touched each one with a long stick lightly on the back; quick as lightning they crouched their dwarfish bodies in the soft mud, and began to work themselves silently out of sight. In a very short time they were invisible.

I saw at a distance a little crab eating a piece of shrimp with his left arm whilst keeping off an importunate enemy with his right claw. Some of these greedy adventurers would crawl straight up from the water to the bait, seize a piece, scurry off, and hide behind a lump of mud, where, feeling secure, they would crouch in their hateful way and devour their prey. I once saw an octopus at Naples hug a crab under one arm whilst he ate his brother with another. They are fit company, these terrible monsters, and it is their human-like actions that make them so loathsome.

Joey had cast a few bloater-heads on to the mud, and two or three large crabs—the largest I saw were four inches across the greatest diameter of the body—were actually stalking these heads. They advanced in a body, marching in open order, seeking cover, like riflemen as they skirmish, in the depression of gunners' footsteps left in the mud. They evidently did not know what those herring-heads were, and they approached them cautiously, fearing an ambush. It was very funny to watch these pigmies dodging swiftly over hummocks and creeping through hollows, until the leading crab—all these adventurers were old and scarred—drew near to the advance guard of herring-heads, when he stood twitching his claws nervously for a moment, then making a dash he came off triumphantly with a bloater's head. Beating a hasty retreat to the water's edge, he crouched down and began to tear and eat it in his repulsive and even human manner. I have caught some of these loathsome creatures, and taken them on to the dry, hard flat. Placing one on the slub, he would run for a little way, and, seeing that all paths of escape were shut off, he would suddenly turn on to his back, spread his feet and claws out loosely, and feign death. They will keep up this ruse for hours, if necessary, until the flood comes to their rescue. At times I have seen them eat pieces of bad fruit, and it seemed to me that afterwards I saw them sitting in melancholy attitudes along the water-side with their claws on their stomachs, but I will not vouch that they suffered much, and that this was not a flight of the imagination. I have seen a crab hugging a half-shrimp under its arm, the shrimp's feelers sticking up in the air and looking for all the world as though the shrimp were the crab's baby, and the crab the shrimp's nurse. The young crabs seem to go sideways as a means of progression far oftener than the older crabs, who rarely go aslant, unless to dodge an enemy. They look loathsome as they half swim, half crawl through the shallow water; it adds a new terror to their appearance. Altogether they are a green-brown, filthy family, hateful to behold.

More of them have gathered round the shrimps now, and they drag themselves through the noisome mud, carrying titbits to their horrid maws with their claws. One old brown crab, fearful in aspect as he waded through the shallow water on the flat waving his arms, which looked like human stumps,

so graceless and clumsy were his movements. As he neared the morsel of shrimp lying on the mud, he arose in his footsteps and darted out one of his stumps upon the shrimp, clutching it with greed, the greed of the miser. 'Twas a terrible picture! Another ghoul of full growth came and rested on the ooze quite close to me. I was fascinated by his bestial actions, so human were they in movement and sentiment. He fixed his claws into a sole's eye and tried to tear it from the socket; when that attempt failed, he neatly *dissected* and removed the sclerotic with his sharp, razor-like claw; then, holding the sole's head with one claw, he attempted to tear out the eye with the other. It was a ghastly sight! Being a superficial anatomist, he had not thought of the remaining attachments. Still nothing daunted, like an ogre, he grasped the eye tenderly in both claws, and, crouching, fixed his fearful maw into the luscious morsel, sucking its juices like a guilty thing. When he was satisfied he drew himself up to his full height, and stood contemplating the rest of the head. Then I could plainly see the cold, cruel, triangular, inhuman face, with eyes set wide apart, with cruel hairy mandibles and chinless face, the whole expression being one of brutal lust, without one ray of light to illumine the dreadful countenance. Methinks had old Æschylus drawn a giant-crab plucking at the vitals of Prometheus, everyone would have trembled as they read. No hideous monsters of man's imagination will ever be so hateful as the crab and octopus. This dreadful ugliness is not noticed by the casual observer, but it is there. The beauty and ugliness of nature lie side by side, and the artist finds both, though he does not always speak of them.

INSTANTANEOUS PHOTOGRAPHY.

BY JAMES MEW.

Archbishop Trench, in his chapter on the Morality of Words, and especially in that part of it which treats of their degeneration, might, if he has not done so, have treated of many expressions which have fallen away from their original and proper meaning, in consequence of that dilatoriness and tendency to procrastination which disfigures morally a large section of mankind.

Our own language testifies against us. *Directly, presently, in a moment, in an instant*, even *at once*, have a latitude of meaning far removed from their real and etymological signification. The word *instantaneous*, as used in photography, is equally vague, uncertain, and elastic. It may, in fact, mean any lapse of time, from a cap on-and-off exposure of about half a second, to exposures by mechanical shutters occupying a ten-thousandth of that unit of time. Only a twenty-thousandth was, it is said, used by M. Janssen, the French astronomer, in his celebrated picture of the sun. But just as the word *photograph*—instead of which, from the analogies of *telegraph* and *telegram*, we should suppose *photogram* ought to be substituted—has prevailed over and utterly routed its correctly shaped but less fortunate congener, so *instantaneous* is little likely to be now ousted from its time-strengthened dominion, and its linguistic singularity is overlooked in the nearer consideration of its practical convenience. A little after the time of its birth, however, fault was found with it by an Algerian photographer called M. Penne, for the somewhat remarkable reason that it did not, for him, represent sufficient fastness. He accordingly christened an invention of his own by the name *Francaise-extra-rapide*, by which, the public were assured, could be taken a "perfectly instantaneous" photograph—a marvel, indeed, to the mathematical mind.

"There is nothing new," says an ancient and respectable authority, "under the sun." It is well known to most folk fairly skilled in this branch of science that instantaneous photography, which has been regarded as the crown and perfect flower of the photographic art, was what the French call a *fait accompli* half a century ago. In an old number of the *Art Journal* for 1851, a number printed at a date very nearly corresponding with the death of Daguerre, the public is informed that this great artist many years since stated that he had succeeded in copying a moving procession and a crowded market-place with every image faithfully impressed. The surfaces so highly sensitive to solar radiation upon which these pictures of motion were delineated were silver plates prepared with iodine and bromine under "certain forms of manipulation" with which the reader is not made more nearly acquainted. The preparation seems never to have been sufficiently certain and definite for general application. As an instance of occasional success on paper, the representation of a man's foot was exactly transferred in the *camera obscura*, as it was then commonly called, during the process of lifting it from the ground and returning it again, so high a degree of sensibility was then attained. But an experiment made at the Royal Institution about the same period by Mr. Fox Talbot seems exceptionally interesting when we remember the antiquity of its time. On a wheel moving with great velocity a printed paper was affixed. The *camera obscura* was properly adjusted with an albumenised glass plate, and the room darkened. An exposure was then made at the exact moment the printed paper was illuminated by a light obtained by the discharge of a Leyden jar. Then, notwithstanding the velocity of the wheel and the speed of the light, a picture of the print without a blur was obtained on the sensitive tablet.

This sensitive surface was, says the *Art Journal*, produced by a "modification of two processes already well-known, the addition of a hydrocarbon compound being, in all probability, the quickening agency." But in the London *Athenæum* of December, 1851, Mr. Fox Talbot himself gives the whole process of preparing the plate, a process involving ten distinct operations, with which any curious reader who will may become acquainted.

It was seen clearly by Mr. Fox Talbot that all which was wanted to produce the marvels of the present was increased sensibility of the plate, and an augmented intensity of the light. It was, moreover, stated by him that the iodide of iron, an important factor in the result, must be in a "peculiar or definite chemical state," and that an exact adjustment of the proportions of the several ingredients in his recipe was absolutely necessary. Without this no exalted sensibility could be attained, nay, scarcely any photographic result would be produced.

Instantaneous positive paper has also been supposed a comparatively recent invention, yet how far this supposition is exact may easily be discovered by any reader who will trouble himself to read a communication by H. Claudet, published in *La Lumière* in the month of March in the year 1855. Only, however, since the introduction of gelatine plates has instantaneous photography become largely important.

The detective camera has been said, perhaps without sufficient accuracy, to be a misnomer, because the external form of the camera must be concealed in order to constitute it a detective. So, it might be urged, that excellent constable Z000 is not a detective when attired in the ordinary raiment of the policeman. But it seems clear that Z000 is no less a detective in his ordinary raiment than when clothed in the unwonted apparel of a market

gardener or a city clerk. In the former case the detective business could not, indeed, be so satisfactorily accomplished, just as the revelation of the camera would certainly startle an artistically stalked head of game. It would, of course, be desirable that this instrument should put on one of those many shapes which have been suggested by ingenious individuals to disguise it. It might be in the shape of a hat, an oppressive burden in the dog days; a foot ball, which could not well be introduced into general society; a boot, only available, unfortunately, where the operator has a club foot; or a bundle of books from Mudie's, tied round with the regulation strap, probably the least inconvenient suggestion of them all.

As to the collapsible umbrella, and the vest or button camera, the trouble of the one lies in the fact that the machine will not work till the umbrella be put up—a somewhat ridiculous operation under cover or on a fine day; and with regard to the other, however ingeniously covered by the special stiff leather waistcoat fastened by black tape round the body, and however carefully the projection of the lens-tube may be disguised under the semblance of a button, some little suspicion must surely be aroused about any gentleman, with whom an acquaintance has been previously established, by his sudden and alarming accession of fatness. A lady might possibly bear about, to midnight dances and the public show, a detective camera undetected, by the simple device of substituting it for what is known among the secrets of the feminine toilet as a dress-improver, an ingenious though hardly honest contrivance designed to produce the appearance of a bounteous mammillary development in a cachectic subject as flat as the proverbial pancake. Still, whatever form a camera may assume—whether it come in the questionable shape of a bag, or hat, or ball, or boot, or book, or umbrella, or buttoned vest, or dress-improver—it seems to have no more right to the title of a detective camera than the pure and simple instrument undisguised, if used for detective purposes.

(To be continued.)

ARTIST PHOTOGRAPHER—A CLAIM FOR LIBERTY.*

BY HENRY E. DAVIS.

You have been good enough to honour me with an invitation to read a paper before your Society, and I am glad to do my mite of assistance at your proceedings, although it is with a fear that the few sketchy ideas which I am about to mention will hardly be worthy of an association of teachers and students of science and art.

The remarks which I am about to address to you relate to a question which has, for some year or two, perturbed the photographic world; whether with adequate profit or not, those who have followed its perhaps too ample discussion will either have formed already their view, or if not will, in all probability, be so fogged by the various statements and arguments *pro* and *con* that they may do anything but bless the day when the various photographic societies and journals first encouraged the discussion of the topic. You have no doubt already guessed that my subject is the position of the artist photographer.

In recent years a small clique of self-appointed prophets has arisen in photographic circles yclept naturalistic photographers, and one might suppose that it would be correct to assume that if there is any meaning in the name, it should indicate a desire to reproduce nature in its form as it appears to us. It is difficult to ascertain exactly what their tenets are; but anyhow, it is plain, from what can be ascertained from their writings or examples, that such an assumption would be decidedly incorrect. This school appears to have had its origin with a gentleman whose lubrications would intimate a large consumption of works on art criticism, and perhaps a very omnivorous inspection of art examples, without the power of discriminating between the wheat and the chaff, and so jumbling up ideas on art matters that, as a teacher, he seems to me to be pretentious and apparently free from technical ar knowledge, without which it is impossible for him to estimate the rightful position of the artist photographer.

Let us start our view of the matter from the purely photographic side. When I say the purely photographic side, I mean the position indicated as the result of using optical instruments, apparatus, chemicals and preparations, all of the highest excellence that science can provide, with full ability to utilise to the utmost all their respective merits. I think I may take the lens as being the most important member of the outfit, and it has ever been the aim of its producers to improve it for various purposes, so that it should give the clearest and sharpest definition when used to its utmost advantage. On the other hand, photographers have encouraged such improvement by preferring and readily paying for the objectives which best succeed in accurately registering the most minute definition as result of their use; and so much has this been sought after that "photographic," as a colloquial term, has established itself in all civilised languages as an equivalent for minute exactitude of detail in other things than that to which it originally attached.

As a reproductive science in the foregoing sense, photography has proved of inestimable value to the world, and will continue to be so for purposes of science and the arts generally. For such purposes its exact registration can be depended on only provided its workers are thoroughly conscientious practitioners, fully skilled in making the highest practicable use of the best procurable tools. So much for pure photography.

Now let us examine the other phase of photography claimed as an art. It is here that the misapplication of a term has assumed for a vehicle of expression the attributes of such expression. The position of the artist photographer seems to me to be this: He must be as fully informed, and as capable in the practice of photography, as the reproductive practitioner previously referred to—in fact, more so; he ought to study all new processes, especially printing processes, and produce his pictures in that one best suited to his subject. Being well informed in the technics of photography, what is he to do with his apparatus and knowledge? He is to do the same as the painter does with his oil or water colour, or the sculptor with his clay, of the manipulation of which each has technical knowledge: he is to use photography not as the be-all and end-all of his study, but simply as a vehicle for the exposition of his artistic powers; it should occupy in his mind no higher position than the other media which he might use for the same purpose. He will have high-class apparatus and the technical knowledge for making a first-class photograph, which he will use with his best capacity, just as he would go to a first-class manufacturer for the best colours and canvases, and use them with brains, with the

* A communication to the University College Photographic Society.

same ultimate object. He must, having his materials for work and a proper artistic judgment, be left as entirely untrammelled as the artist painter, to produce in his own manner the ultimate outcome of his imagination in the style best adapted to his view of his subject. It is a huge presumption of any man or set of men to come to him and say, "You shall execute all your pictures with the utmost reproductive exactitude," or "You shall execute all your pictures blurred or out-of-focus in whole or in part." Where has any acknowledged art instructor given to the world any such binding axioms?

(*To be continued.*)

LANTERN SLIDE MAKING WITH THE CAMERA.

BY ELLERSLIE WALLACE.

It would be no very difficult matter for us to enter upon a lengthy disquisition here as to the merits of the rival processes of lantern slide making by contact and by the camera. This it is not our purpose to do, however; but we shall simply give some practical points in connection with the latter method which we have found valuable in our own working, and which, we hope, will likewise be of value to our readers. One thing greatly in favour of this method of working is the fact that different sizes of negatives may be utilised for slide making with little or no modification of the apparatus; while in contact printing, of course, the negative must be of the same size as the slide to be made.

In arranging the apparatus for slide making by the camera, it almost goes without saying that daylight is used; whether full sun or diffused light will depend upon the situation and frontage of the work-room. Which of the two is to be preferred is not easy to say. Most operators prefer the even, diffused light of a northern sky; but, in our own practice, necessity compelled us to use a southern exposure, and, after a little experience, we became decidedly fond of it.

To make the difference in working with the north and south light plainer, we will at once proceed to describe the arrangement of the apparatus. In the first place, any small camera, with a plate-holder so arranged as to carry a plate 3¼ by 4¼ inches, is mounted with a good lens of, say, six to nine inches focus. Another camera of any convenient size is arranged to hold the negative in the place usually occupied by the ground glass. If the negatives happen to be just the size of the ground glass, all that is necessary is to remove the latter from its frame and insert the negatives instead, keeping them in position by a few small tacks or pins. If the negatives are of a smaller size, a piece of thin wood is cut to the proper size, and rabbetted so as to hold the negatives, the whole being then inserted in the ground glass frame and kept there by pins—or, better, by a couple of pieces of clock-spring an inch long confined by a small screw run through a hole in one end, the other end being left free to press the negative carrier firmly into position. As many of these carriers should be prepared as there are negatives to be worked with. The lens and front panel of the camera holding the negative are dispensed with.

A stout, flat board, from five to eight feet in length, is now provided with cross-legs at one end, so that it can be rested on the window-ledge by the other end, and be firmly supported. If a southern exposure be used, it will be found most convenient to place the board as mentioned, with a large sheet of ground glass or white tissue paper behind the second camera in the window. The board holds both cameras, the one used for exposing the plates being inside, or nearest the operator, while the other, which holds the negative, is set quite near the white paper to the window, so that the negative receives a full and equable illumination from the paper. The exposing camera is now brought near enough to give an image of the proper size on the ground glass, and care taken that the exact centre of the image falls on the centre spot of the ground glass. A sliding front on the exposing camera will greatly facilitate correct centreing; though if the cameras differ much in size, it may be necessary to elevate one or other of them on a block of wood. If this be done, see that everything is steady before uncapping the lens to expose; any tremor or jarring would be fatal to good results; so both cameras ought to be firmly screwed or clamped down to the board.

There will now be a space intervening between the lens of the exposing camera and the front of the carrying camera, unless the lens be of such short focus that it can be inserted into the latter. This will seldom happen. The space intervening should always be darkened by throwing a cloth over both cameras, supporting it by two sticks at each side to keep it from encroaching upon the field of the lens. The object of this is to prevent any stray light from entering the lens, and thus to utilise only the light that passes through the negative.

It will not be amiss for us to repeat in this connection some advice which we gave when speaking of mechanical aids to increase brilliancy of image. The principle we have just enunciated—of utilising only the light that goes directly to the formation of the camera image—is tacitly admitted by all careful photographers; but, in practice, we rarely find it attended to as it deserves to be. If it was worthy of regard in the days of wet collodion, when plates were of low sensitiveness, it is far more so now, when things are so much improved. Slide making depends greatly upon a clear, brilliant image on the ground glass. Unless we have this to start with, the best chemicals and manipulations will be thrown away.

The arrangement of cameras we have just been describing is very practical and inexpensive; but, inasmuch as the whole apparatus *faces the light*, there will often be reflections from the sides of either camera that will interfere seriously with brilliancy of image. Now, as we mentioned in the article previously referred to, if a large diaphragm of blackened cardboard—or, better, card covered with black velveteen—be placed a few inches in front of the sensitive plate, it will cut off these stray lights and be of great value. It will sometimes be worth while to have such a diaphragm in each camera; they are easily made, and as easily adjusted.

Supposing that a north light be selected instead of a south, it will generally be found more convenient to elevate the end of the board carrying the negative camera, so that the sky itself may act as the illuminant, thus filling the function performed by the white tissue paper in the case of the south exposure. As the sun in the south exposure shines upon the paper, it gives, of course, a very brilliant light, far more so than the blue sky in the north, and the exposure will be much shorter. It is open to the objection that when clouds pass over the sun the strength of the light varies very greatly; but this same objection holds true to a great extent with the north light, except that,

in the latter case, the exposures will be much shortened when a white cloud drifts into that portion of the sky towards which the apparatus is directed.

When the south light is used, we should recommend that the apparatus be kept horizontal, and the white paper screen be set rather close to the negative, at a distance of, say, four or six inches. This will allow room for the hand to pass between, and so facilitate the shading down of special portions of the negative that are too transparent and print too quickly.

The exposure should be made by uncapping the lens, care being always taken to wait until the tremor caused by drawing out the door of the plate-holder has quite subsided.

The question whether to use gelatine or collodion plates we leave to our readers to decide for themselves. We ourselves prefer collodion; but excellent results may be obtained on slow gelatine plates, particularly if developed with hydrokinone or ferrous oxalate.

The matter of exposure must be settled by experiment, but we must caution our readers never to over-expose plates intended for lantern slides. No restraining or tinkering with the developer will make up for over-timing, and the disagreeable muddiness which it produces. —*American Journal of Photography.*

THE BATH LITERARY AND PHILOSOPHICAL ASSOCIATION.

LAST Friday, according to *The Bath Gazette*, the Bath Literary and Philosophical Association invited the Bath Photographic Society to arrange a photographic evening. This took the form of a conversazione, and drew a large attendance. One of the chief features was the collection of photographs on exhibition, which included a large number illustrating some of the grandest scenery in North and South America; they were of large size, printed direct, and not enlargements from small negatives. The lender of this series was Miss Ashley; they were produced by American publishers. A great attraction was the fine collection of transparencies shown by the President of the Photographic Society, Mr. W. Pumphrey. These, between 100 and 200 in number, included exquisite specimens, especially in the way of instantaneous work. Mr. Pumphrey also exhibited an interesting series illustrative of places mentioned in the Old and New Testaments. Mr. A. F. Perren contributed a collection of pictures produced by the platinotype process; they were chiefly "bits" round Bath. A fruit and flower series was placed on view by Mr. E. C. Peacock, and views of Norway by Mr. Bristow. Mr. H. G. P. Wells' principal picture was an enlargement of a small negative illustrative of farmyard life, and an "instantaneous" of the well-known Weymouth swans. Mr. W. Middleton Ashman exhibited some fine bromide enlargements; amongst them was Widcombe Old Church, and a splendid portrait of the President. Photographs were also sent by the Rev. E. A. Purvis, Messrs. W. Gibbs, C. Cloakley, F. J. Saunders, G. F. Powell, E. J. Appleby, B. Williams, R. C. Bush, E. Pitman, W. Howe, Hippisley, Collins, Pitt, Menduin, Peyton, and others.

The President of the Photographic Society, Mr. W. Pumphrey, took the chair, and read a paper giving a brief history of photography from its earliest stages. Its chief point of interest was the claim it made that Mr. Henry Fox Talbot, of Lacock Abbey, should have precedence over Daguerre as the true progenitor of the modern art of photography. The actual MS. of his paper read before the Royal Society in 1839 was handed round, it having been presented to the Bath Society by his son; and some reproductions of his pictures, obtained from the some source, were similarly exhibited. At the same time was shown a specimen of Daguerre's process, and it was explained that whereas Mr. Talbot's could be reproduced, thus being a true prototype of the modern process, Daguerre's photographs could not be copied except in the same way. Mr. Pumphrey made special allusion to the revolution in the art brought about by the introduction of substitutes for the old wet plate system, and observed that the tendency is to still farther reduce the impedimenta by taking small negatives, and if required, enlarging.

Mr. W. Middleton Ashman, secretary of the Photographic Society, exhibited and explained old and the new apparatus. The contrast between the cumbrous box which formerly served the purpose of a camera, and the handy, compact form of the most recent contrivances, set forth clearly the great developments of the art in recent years, and some of the newest adaptations, such as the pin-hole and detective cameras, and the Thornton-Pickard shutter, were also explained.

In the course of Mr. Ashman's address, flash-light pictures were taken with the assistance of Mr. Wells, and immediately carried to the dark room, developed, and transparencies made for subsequent exhibition.

Mr. A. F. Perren gave a description of the platinotype process.

Subsequently the company settled down for an exhibition of lantern-slides. These, for the most part, dealt with show places well known to Bath tourists.

THE SOLAR CLUB will meet on Monday night next at the Café Royal to celebrate the twenty-fifth anniversary of the Club. Several of the founders of the Club will be present, and a considerable number of guests is also expected.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—On Tuesday next, December 9th, at 5A, Pall Mall East at 8 p.m., a paper will be read on "Photography Applied to Astronomy," by E. W. Maunder, F.R.A.S. A discussion will take place on the suggestions which have been made with regard to the proposed Photographic Institute.

MR. GAMBIER BOLTON had the honour of attending at Windsor Castle on Saturday last, and exhibiting before the Queen and H.R.H. the Princess Beatrice his series of animal and bird studies from life, which were highly praised; and Her Majesty accepted seven large studies in bromide of the lion cub lately presented to her by the Sultan of Sokoto, Africa.

FLASH-LIGHT PHOTOGRAPHY.—Last Monday and Tuesday evenings, Mr. R. Slingsby, of Lincoln, gave a demonstration in the studio of Messrs. Marion and Co., Soho Square, London, of taking portraits by the magnesium light. There was a large attendance of professional photographers. Mr. Slingsby exhibited some improved appliances of recent date; he used six flash-lamps and gave rapid shutter exposures; the pneumatic arrangement released the shutter and actuated the lamps the moment the ball was pressed. Messrs. Marion and Co. have introduced into the market special apparatus for this class of work, and Mr. Slingsby used it at the two meetings mentioned.

THE NEW PREMISES OF THE CAMERA CLUB.—The *Journal of the Camera Club* says:—"As most people are aware, the removal of the Club from its present quarters to the new premises in Charing Cross Road will take place at Christmas. Although a portion of the new building will be ready for occupation, the whole of it will not be out of the workmens' hands, and had it been possible to have remained for a month or so longer in the rooms which have served us for the last five years, it would have been desirable to do so. But the present rooms have been let to others, and the committee have been unable to effect any arrangement to retain them after quarter day. Possession of these new premises was confidently promised at Michaelmas last, and therefore, even allowing for a lack of punctuality which is common to the professors of the building art, the committee had reason to hope that at a reasonable time before Christmas the building would have been handed over to them ready in all respects for occupation. That hope has not been realised, and as our present lease expires at Christmas, we must then take possession of what is ready for us in the new building, and leave the formal house-warming to a future occasion."

THE APPLICATION OF NAPHTHALIN DERIVATIVES AS PHOTOGRAPHIC DEVELOPERS.*

BY J. F. SACHSE.

Dr. M. Andressen, of Berlin, the inventor and manufacturer of eikonogen, has lately patented ten new combinations obtained from napthalin, viz., diamidonaphtalinsulfo-acid and amidonaphtolsulfo-acid, which, it is claimed, will work a still greater revolution in photographic development. It is stated that the reducing power of these new compounds is so varied and controllable that in the near future a negative may be developed rapidly or slowly, dense or weak, according to the wishes of the operator—a property which will prove of the greatest practical value in the various branches of the photographic art. These various derivatives are described as follows:

1.—*Dioxynaphtaline.*

Theoretically there are ten combinations of dioxynaphtaline possible; of these nine are known, six of which appear to be of great value, as they bring out the photographic image rapidly and strongly, and, in the opinion of the inventor, are especially valuable for instantaneous exposure and gallery work, viz:—

1.—α Naphto-hydrochinon.
2.—β Naphto-hydrochinon.
3.—α_1 α_3 Dioxynaphtalin.
4.—α_1 β_3 Dioxynaphtalin.
5.—α_1 β_4 Dioxynaphtalin.
6.—β_1 β_3 Dioxynaphtalin.

2.—*Dioxynaphtalinmonosulpho-Acids.*

Of the various compounds obtained, either by oxidation and subsequent reduction of amidonaphtolsulfo-acids, or by the fusion of naphtoldisulfo and naphtalintrisulfo-acids with caustic alkali, or by the sulphuration of dioxynaphtaline, resulting in dioxynaphtolmonosulfo-acid, β naphtohydrochinonmonosulfo-acid was the only compound which has proved of practical use.

3.—*Dioxynaphtalindisulfo-Acids.*

The experimental trials of the dioxynaphtalindisulfo-acids obtained by the different methods has shown that both of the dioxynaphtalindisulfoites described in D. R. P., No. 49857, have special claims as photographic developers, as they cause the image to come up slowly but with great strength, a property which makes the compounds of especial value in landscape photography.

4.—*Amidonaphtole.*

Of the different amidonaphtoles, which are obtainable by the reduction of nitrosonaphtole, nitronaphtole, or from the azo-colours from naphtole, or by the fusion of the naphtylaminsulfo acids, the three following derivatives show extraordinapy power and rapidity when used as a photographic developer:—

1.—α_1 Amido, α_2 Naphtol.
2.—α_1 Amido, β_1 Naphtol.
3.—β_1 Amido, β_3 Naphtol (obtainable by the fusion of β naphtylamin and β sulfo-acid).

5.—*Naphtylendiamine.*

The naphtylendiamines require dilute alcohol as a solvent, to combine with an alkaline solution. The two following derivates are said to act rapidly and strongly in developers:—

1.—α_1, β_1 Naphtylendiamin.
2.—α_1, α_2 Naphtylendiamin.

Together with the advices of above new reducing salts for photographic developers, comes the welcome announcement that the manufacturers of eikonogen have at last succeeded in finding a means of entirely preventing this substance from becoming brown and decomposed. The substance by the aid of which the eikonogen is rendered permanent is kept secret. It is merely stated in the circular that a small quantity of the preserving substance is added, and that the eikonogen will in future be manufactured in the form of a white, absolutely permanent powder, for the use of which as a developing agent the formulæ remain the same as hitherto. This improvement will no doubt be welcomed by all those who have tried the eikonogen developer, and appreciate its valuable qualities.

* Translated from Liesegang's *Photographisches Archiv* for the *American Journal of Photography*. We leave the German terms in this article unaltered.

OPTICS AT THE EDINBURGH PHOTOGRAPHIC EXHIBITION.

On Thursday, last week, there was a large attendance in the Edinburgh Photographic Exhibition on the occasion of the weekly lecture. The speaker was Professor James Hunter, of the Royal Dick Veterinary College, and the Heriot-Watt College, and the subject was "Photographic Optics." Professor Hunter spoke of the relation between mathematics and optics, and of the advance made not so long ago, when mathematical principles began to be employed in the manufacture of lenses; then he gave an exhaustive description of the differing properties of lenses of different construction. Even at the present day, he said, the best lens is but a compromise between spherical aberration and sharpness of image, but he was satisfied that lenses are now as perfect, at least for photography, as they ever will be, while at the same time the lenses used are too good for the rest of the apparatus. Speaking of lenses to give atmospheric effect in a picture, he said that the lens which would probably be selected by an artist with that object would be one in which there would be several errors. He did not wish to decry artistic work, but a photograph was a different thing from a picture. The extreme minuteness of detail is one of the elements of the value of photographs. He showed that no single lens would ever bring light to a focus, entered into an explanation of total refraction, the aberration of the leus and the optic centre, and demonstrated the advantages of the diaphragm—the sheet anchor in all photographic instruments. He regretted that diaphragms were almost invariably incorrectly placed, and showed how their proper position could be readily ascertained. He also explained several trade terms, such as fixed focus, roundness of image, true perspective, and atmospheric effect; and with the aid of a lantern showed the effect of passing a beam of light through different descriptions of lenses. Dr. Hunter also illustrated his lecture by projecting the images of slides through lenses entirely home made, and formed of spheres of glass, or portions of spheres, with, in some cases, flat portions of glass cemented to them, thus forming vessels which were filled with water, and by which means he illustrated the various forms of lenses, also their defects, and the means employed for correcting them.

These operations were actually done in the presence of the observers, and it was extremely instructive to see the sharpening of an indistinct image, the correcting of barrel-shaped lines, and so on. He also employed an admirable set of diagrams specially drawn for the occasion, with geometric exactitude, thus avoiding the mysteries of x and y, and lucidly explaining what are often great difficulties to the layman.

Newcastle-on-Tyne and Northern Counties Photographic Association.—The next monthly meeting will be held in the Mosley Street Café, on Tuesday, the 9th of December. This will be a lantern evening, and the Association's new lantern will be in use for the first time.

Manchester Amateur Photographic Society.—At the next meeting, to be held at the Manchester Athenæum on Tuesday, December 9th, Mr. G. Wheeler will read a short paper on "An Hour's Bromide Printing," with examples; and a demonstration will be given by Mr. H. M. Smith of "Enlarging and Contact Printing on Bromide Paper."

Notes.

The Attorney-General, in his presidential address to the Society of Arts, was somewhat inaccurate in his remarks, published in this journal last week, in relation to the history of photography in natural colours. He spoke of Sir John Herschel's experiments in 1840 as if they were the first in connection with the subject; as a matter of fact, the first photograph in natural colours was taken by Dr. Seebeck, of Jena, who communicated his method to Goëthe, and the latter published the details of the experiment in 1810 in his *Farbenlehre*. Then, again, Sir Richard Webster said nothing about Becquerel, who did far more than any other living man in successful research in relation to photography in natural colours; no better results have ever been produced than by his processes. In the third place, the President of the Society of Arts called attention to work of Niepce de St. Victor in heliochromy. In nearly all his work upon this subject Niepce de St. Victor—who must not be confounded with the great founder of photography, Niepce de Châlons—was a mere imitator of Becquerel; he adopted the methods and processes of Becquerel without acknowledgment, and some alleged discoveries of his own in the matter yet want confirmation by the experiments of others. A paper from his pen was read before the Academy of Sciences at Paris; Becquerel pointed out that this paper contained practically only that which he himself had discovered and published years before, and gave chapter and verse for this accusation. The Academy published this protest from Becquerel, and thenceforth published nothing from the pen of Niepce de St. Victor. We have read the original memoirs of both writers in relation to this subject in the order of their dates of publication, and know that Niepce stands nowhere by the side of Becquerel in relation to the subject of photography in natural colours. The Attorney-General had been consulting Hunt's book, and had probably been misled by some faulty and slipshod historical utterances therein.

On the 30th of March next, the last Congress of Astronomers, preparatory to the execution of a photographic map of the stars, will be held in Paris. Meanwhile, instruments for the purpose have been constructed, and trials have been made of some of them at various observatories. Admiral Mouchez has exhibited at the Academy of Sciences a magnificent photograph of the nebula in Lyra, obtained at the Observatory at Algiers. The print had been enlarged to sixty-four times the size of the original negative, and is said to have possessed remarkable sharpness under the circumstances, thanks to the purity and stillness of the air when the negative was taken. This photograph, also, is one of those which here and there shows that there are objects in the heavens which photography can reveal, but which are invisible to the eye, even when aided by the most powerful teleseope.

If one wants to guage the popularity of any particular hobby or pastime, there is no better method than a glance through the columns of that useful journal, the *Exchange and Mart*. We are thus enabled to judge whether postage-stamp collecting is declining or flourishing, and whether fowls, rabbits, dogs, or silkworms are at present the most favoured pets. An entire column is devoted to photography, which speaks well for the popularity of the art, considering the season of the year; but the articles offered in exchange by would-be photographers are sometimes curious as well as amusing. Thus, one person wants a good rectilinear lens, in exchange for which he will give a new black melton overcoat, which will fit anyone who is five feet nine inches in height, and who measures forty inches over his waistcoat. Another advertiser owns a thorough-bred collie dog five months old, which he is willing to exchange for a 10 by 8 camera. It is evident that this latter advertiser rates his animal somewhat highly, for, according to other advertisements in the same column, the average value of such a pup is one pound, and no one can, with any conscience, expect to buy a camera of that size so cheaply.

Most things, from pills to aniline dyes, can now be had by the penny packet, and a vast convenience they afford to persons whose purses are not too well lined. Among the recent introductions of this kind is one which is of great use to those who, like photographers, have to deal with delicate apparatus—with its liability to fracture. We allude to the penny packets of powdered glue which are now sold by most oilmen. The making of serviceable glue, except to a carpenter, is, under the ordinary condition of things, a matter of serious import. A glue-pot of some kind must be found, the glue must be broken up, and when all that is necessary to do has been done, the resulting compound is either too thick or too thin, lumpy or stringy, or in some other way unsatisfactory. The powdered material sprinkled into a little boiling water contained in a tin canister, and placed in a saucepan, makes in one minute a small quantity of excellent glue, which will do to mend cameras and printing frames, and which will act as an excellent mountant, either used by itself, or as an addition to other materials. It is not cheap intrinsically, for a penny packet does not hold much more than half-an-ounce; but the form in which it is presented, and the opportunity it affords of making a small quantity of trustworthy material almost instantaneously, make it cheap indeed to the busy worker.

In the suburbs it is not uncommon to find photography allied with some other business, and very often we fancy as an attractive bait with which to secure customers for that other business which is considered the more important of the two. This would seem to be the case with an enterprising tobacconist whose premises we passed the other day. By means of a poster outside his shop, he announces that with every ounce of tobacco bought, he will give the purchaser a

voucher, a certain number of which will entitle the holder to have his portrait taken for nothing. The plan, we were told, worked exceedingly well, the farther copies of the portrait which were generally ordered making the method a profitable one.

An addition to the almost limitless list of instantaneous shutters was described at the last meeting of the *Societé Francaise de la Photographie*, which, as it embodies a novel principle, is worth describing. As M. Chameau, who brought it before the Society, said, to call it a shutter is somewhat of a misnomer, as it forms an integral part of the camera, or rather, of the lens. The invention consists of a system of iris diaphragms containing twelve blades, which are put in motion by a handle placed on the outside. The handle has only to be pushed from right to left to enlarge or contract the diaphragm. The movement is so gentle, and the working so easy, that the opening may be modified even during the moment of exposure. M. Chameau's opinion is that, up to the present, such a result has not been obtained with equal facility.

The case of Sternberg *v.* Thaddeus, held this week before Mr. Justice Day, exemplifies the extreme difficulty, familiar enough to photographers, in judging of the fidelity of a portrait. In the case in question, the issue was narrowed to the difference between an engraving and the original picture, yet the evidence of the experts was extremely contradictory. Mr. Sternberg, an engraver, was employed by Mr. Thaddeus, a painter, to execute a mezzotint engraving of a picture of Sir Richard Owen, painted by the defendant. The result did not please Mr. Thaddeus, and he refused to accept the engraving. On the minor facts of the case we need not dwell. The point of importance is that, while Mr. Algernon Graves, the well-known engraver, Mr. Arthur Lucas, the art publisher, and other experts, said the engraving was excellent, Sir Frederick Leighton, Mr. Lehmann, and Mr. M'Lean thought the reverse; Mr. Lehmann's opinion being that the nose was like a potato. The value of Sir Frederick Leighton's evidence was certainly weakened by the fact that he had only compared the engraving with a photograph of the painting, and not with the painting itself. Unless a painting is painted specially with a view to being photographed, it may be that the actinic values of the colours represented in monochrome may give a totally false effect, enlarging or diminishing the shadows as the case may be. In view of such discrepancies, the jury gave the verdict for the plaintiff, as, whatever the result may have been, he certainly had done the work. There is some justice in this. To please everybody in regard to a likeness is a most impossible task. Not infrequently, as photographers know well enough, the opinion of the critic is slightly biassed by the opinion he has of the original; and, so far as photographs are concerned, they often flatter or caricature according to the likes and dislikes of the person criticising.

The well-known animal painter, Mr. Swan—an interesting biographical sketch of whom appeared in an evening paper the other day—without being a photographer, follows the lines of study which instantaneous photography would suggest to most artists. Mr. Swan's habit, when engaged on a great animal picture, is to take repeated sketches of the animal he is painting until he has succeeded in entirely mastering it and understanding it, and is able to put it on paper in any pose he may think fit. This is the method of the Japanese animal painters, whose patience is inexhaustible in the study of nature. What is a succession of studies but a series of instantaneous photographs? Although the painter may take some time in putting his idea into form, the idea itself is, practically, an instantaneous impression of some attitude. In the works of those artists who study nature intently, extremes meet—the fidelity of the instantaneous photograph together with a suggestion of the variety of movements which only the trained eye and hand of the artist can combine.

We have on more than one occasion suggested the desirability of some school of art which shall interest itself entirely in the production of drawings intended to be reproduced by photography for books and periodicals. At the present moment, artists have to find out what is required of them by photography as best they may. There are no fixed principles laid down beyond black ink and Bristol board. Mr. Henry Blackburn has met this want by starting a class for "Instruction in Drawing for the Press." Mr. G. A. Sala, who is an artist himself, in referring to Mr. Blackburn's enterprise, spots a weak point of which all those who have to do with illustrated papers are fully conscious. Mr. Sala says:—"I apprehend that Mr. Blackburn is ambitious to teach students—especially young lady pupils—how to draw clearly, firmly, and neatly in pen and ink, so that their performances, when reproduced, may come out like workmanlike etchings, and not like ragged, raw, blurred, clumsy scrawls."

The work of lady artists is seldom adapted for photographic reproduction. They cannot see the necessity for drawing a line firmly and with solidity. The scratchy, fine-line method which looks so pretty on paper, comes absolutely to grief when it is reproduced. In the old days, the wood-engraver made up with his burin for the hesitancy of the artist; but the camera is unfeeling in regard to all shortcomings. Another mistake which artists frequently make is that light and shade, represented in the drawing by a light stroke and a dark stroke, will be the same in the reproduction. This, of course, is a mistake. Photography takes notice only of differences in thickness, not differences in tint; hence a light line and a dark line will come out exactly the same in the reproduction. It is a common thing to see drawings—otherwise good—muddy and heavy, say in the shadowed side of the face, simply from neglect of these elementary principles.

THE CYANOTYPE REPRODUCTION OF SEA-WEEDS.*

BY WILLIAM LANG, JUN., F.C.S., PRESIDENT OF THE GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE two volumes which it is my privilege this evening to bring before the members of the Philosophical Society are unique in character, whether they be regarded from a photographic or from a natural history point of view. We have here a series of the British Algæ reproduced photographically, and that by a process which may be reckoned as one of the older photographic methods. The blue process, to give it its more familiar title, dates as far back as the year 1842, and was devised by Sir John Herschel. He it was who first demonstrated that light acts on the more highly oxidised iron salts, known as *ferric*, reducing them to a lower state of oxidisation, to what is termed the *ferrous*; and, as these reduced products manifest with certain reagents a different series of reactions from what the original substance gives, he was enabled to show, in a very pronounced manner, the effect produced by exposure to light. Herschel brought forward many methods for printing with salts of iron, but that particular process with which we are more especially concerned this evening received from him the name of the cyanotype. The iron salt which is generally employed in the production of this class of pictures is the ammonia-ferric citrate, and a solution of it may either be brushed over the paper *per se*, and, when dry, exposed to light under the object to be copied, and afterwards, by immersing the print in a solution of potassium ferricyanide, we find that where the light has acted there will be formed a blue product; or the potassium-ferricyanide solution may be mixed along with the ferric-citrate solution in the first instance, when a simple immersion in water is sufficient to bring out the picture. The process remains in use to the present day, and is employed by engineers and draughtsmen for the reproductions of drawings, plans, &c. Specimens of prints obtained according to the method indicated you see here, the lines of the original being reproduced in white on a blue ground. By a modification of the foregoing process it is possible to reproduce the lines of the drawing blue on a white ground. Both papers are prepared commercially. A specimen of the results obtainable by the paper last described is to be seen on the wall. It is generally known as Pellett's paper.

Regarding the permanency of the cyanotype process, we have in the two volumes before us sufficient evidence that prints produced by the blue process are lasting and enduring. Although it is more than thirty years since these impressions were obtained, the brightness and freshness, nay, in some cases, the vividness of their character, would almost induce us to believe that the prints had been but recently produced.

It may be interesting to give the following particulars regarding the volumes and their contents. Opening the first volume, we find the initial page has the title "British Algæ, Vol. I.," printed in white on a blue ground. Obviously the lettering had, in the first instance, been printed on a white sheet of paper with ordinary ink, and, this being superimposed on the sensitive paper, the printing was done in a manner similar to that employed when dealing with the ordinary photographic negative. The following page has the inscription "Photographs of British Algæ—Cyanotype Impressions." The third page explains the purport of the work, and is a facsimile of the handwriting of the producer. It reads as follows:—

"The difficulty of making accurate drawings of objects so minute as many of the Algæ and Confervæ has induced me to avail myself of Sir John Herschel's beautiful process of cyanotype to obtain impressions of the plants themselves, which I have much pleasure in offering to my botanical friends.

"I hope that in general the impressions will be found sharp and well-defined, but in some instances, such as the Fuci, the thickness of the specimens renders it impossible to press the glass used in taking photographs sufficiently close to them to ensure a perfect representation of every part. Being, however, unwilling to omit any species to which I had access, I have preferred giving such impressions as I could obtain of these thick objects to their entire omission. I take this opportunity of returning my thanks to the friends who have allowed me to use their collections of Algæ on this occasion.

"The names refer to Harvey's Manual of British Algæ. I have taken the tribes and species in their proper order when I was able to do so, but in many cases I have been compelled to make long gaps from the want of the plants that should have been next inserted, and in this first number I have intentionally departed from the systematic arrangement, that I might give specimens of very various characters as a sample. "A. A."

The fourth page takes the form of a dedication—"To my dearest father this attempt is affectionately inscribed." Then follow 192 plates of the various specimens reproduced, each one having its botanical name affixed.

The second volume contains 107 plates, to which there fall to be added 80, which have apparently been put in as an appendix, making in all 187. The number of plates in the two volumes is therefore 379. In a note at the end of Vol. II. are the following remarks:—

"Should any of the plants which are omitted, or of which the impressions are from poor specimens, be obtained, a supplementary part may at some future time be added to this work.
"H. P., September, 1859." "A. A."

Through the kindness of Mr. James Britten, Department of Botany, British Museum, I am enabled to give a few details regarding the authorship of these volumes. "A. A." were the initials of Mrs. Atkins, who lived for many years at Halstead Park, Kent, and died there in June, 1871. She was the daughter of John George Children, assistant librarian—*i.e.*, keeper of the zoological department—of the British Museum from 1816 to 1839. On his retirement, he lived with his daughter at Halstead. He died January 1st, 1852, and a memoir of him by Mrs. Atkins was privately printed in 1853. Mrs. Atkins had a large collection of British plants, which at her death was bequeathed to the British Museum, and is now incorporated in the British herbarium there.

How many copies of these cyanotype impressions were issued by Mrs. Atkins I have no means of knowing. From the great labour entailed in their production, it is obvious that only a very few could possibly have been got together. Mr. Britten informs me that there is one in the British Museum. The number of impressions is, however, 411, against 379 in the present volumes, but the introductory prefatory matter is wanting. My informant is of opinion that a set is also to be found at Kew.

The remaining point to be noticed in connection with the cyanotypes shown this evening is the fact that they originally belonged to the late Robert Hunt, F.R.S. In his early days, Hunt worked assiduously at photography, and it is extremely probable that he received these impressions direct from the author. To Hunt we are indebted for the use of iron sulphate as a developer in the collodion process.

* A paper read before the Philosophical Society of Glasgow.

THE CAMERA AND ITS VARIOUS MOTIONS.

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

Chapter II.—General Form of Camera Adjustment for Focussing.

It is not necessary here to take into consideration at all any other kind of camera than that known as the "bellows-body." Wooden "sliding-body" cameras held their own for stereoscopic work long after they had been given up for all other kinds of landscape work, but even for that they have now long been superseded by the bellows-body camera.

Cameras of modern style might be classified in any of various ways, but perhaps we may first of all divide cameras into those in which the adjustment for focussing is done by moving the *back* of the camera—the front, with the lens, remaining fixed—and those in which the back remains fixed, but the front, with the lens, is racked out or in.

The first of the two forms may be typified by Meagher's older form of camera, one that was a favourite with nearly all photographers for a very considerable time, and that

Fig. 1.

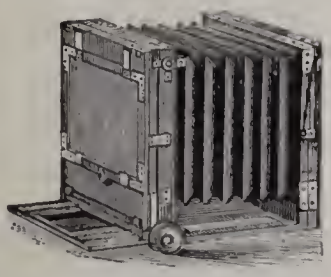

Fig. 2.

is liked by many even now. The objections that there are to this kind of camera in its simplest form are, that it does not very readily lend itself to any great extension, and that the tail-board comes in the way in focussing when a short focus lens is used.

On the other hand, it will be found that, where it is wished to make a photograph of any object whatever on a large scale—say from quarter size upwards—and especially when it is necessary to make it to any *exact* scale, a camera in which the lens is fixed and the back moves is infinitely more convenient than one in which the lens moves. In fact, with the latter, it is nearly impossible to do accurate large scale work. The superiority of a camera with the back moving will be found in the case of any kind of portraiture in which the size is such that the head comes to measure more than about two inches from the chin upwards. Further than this, the camera with the back racking along the base-board is generally very stiff.

The camera with moving front and lens is now the general favourite for landscape work. The chief reasons are the following. Such a form of camera lends itself well to portability and lightness, combined with a long extension, and a fair amount of stiffness, even when extended; there is no tail-board to get in the way in the case of focussing; and, unless a very unusually heavy lens be used, the centre of gravity of the whole camera is less changed by racking out than when the back moves.

The only objection that I know of in connection with this form of camera, besides that already mentioned of its ill-adaptibility to large scale work, is the fact that, in the case of some modifications, the tail-board, or rather base-board, is liable to appear in the picture when a very wide-angle lens is used. The reaction against the use of very wide-angle lenses makes this objection less than it otherwise would be.

I believe the once so well-known "Kinnear" camera (I used one for several years, and found it not to be despised) was the first of the kind at present under discussion; but I think that to Mr. George Hare may be given the credit of being the pioneer of the modern camera with

Fig. 3.

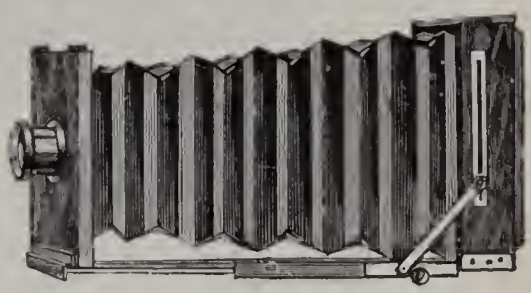

Fig. 4.

adjustment by movement of the front. I illustrate his camera here. Its essentials have been reproduced in nearly every camera that has been introduced since it was patented in 1882. The newer cameras have, many of them, movements not to be found in the camera here illustrated, and doubtless these movements are, for some kinds of work, useful, as will be explained hereafter; but this camera may perhaps be taken as typical of a camera that has all the most essential motions, and that is as light and portable as is compatible with great strength and durability.

Any camera worthy the name is so made that a picture can be taken with the length either horizontal or vertical, and cameras might be classified according to the way in which this is brought about. Roughly, there are two ways. The camera itself is made so that it can be turned bodily on its side, or the camera is made square, with a back so constructed that it can be turned through an angle of 90°. An American invention, whereby the main parts of the camera—that is to say, the back with the bellows, and the front—can be revolved whilst the base-board remains stationary, may be said to come between the two.

The common form of "reversing back" is so made that it is removed entirely to change its position from vertical to horizontal, or *vice versa*; but recently a "revolving back" has been introduced. The back revolves without taking it from the camera at all. This is certainly a convenience in many cases, and a minor advantage is that

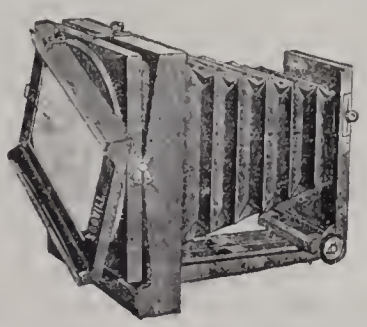

Fig. 5.

if, as sometimes happens, after focussing it is found that the camera has been put in so cramped a place that the shutter of the slide cannot be drawn, the back may be revolved through a right angle, the shutter drawn and turned back, and the back revolved back to its original position.

The revolving back is, I believe, an American invention. I illustrate it here. It may be said that the camera that has

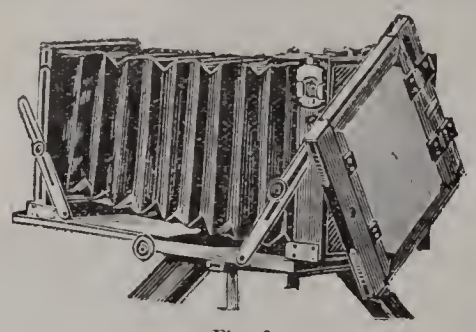

Fig. 6.

to be bodily turned on its side to change the picture from horizontal to vertical has practically been entirely replaced by the camera with a reversing or revolving back.

Focussing Adjustment.—The origin of the "rack-and-pinion" of lenses was the common construction of the older forms of cameras, which had "sliding bodies" with no finer adjustment than was given by pushing or pulling by hand, so that it was nearly impossible to focus accurately with them. Rough focussing was then done by hand, and finer focussing with the "rack-and-pinion." The universal adoption of a comparatively fine form of adjustment of the camera itself has entirely done away with the necessity or desirability of a rack-and-pinion for the lens itself. They persist now, to a certain extent, merely through the inertia of custom. A curious illustration of this is to be found in the fact that I have seen recently made lenses with rack-and-pinion, the focus of the lenses so long that the milled head of the pinion could not possibly have been reached from the place of focussing. I think it likely that the partial persistence of the rack-and-pinion on lenses is due rather to the photographer than to the optician. The former has a sort of idea that there is something of gorgeousness about a rack-and-pinion, and the latter has no objection to provide it at a cost that must allow him a handsome profit.

A screw of coarse pitch running the length of the camera, with bearings fixed to the base-board, and a nut fixed to the moving part of the camera, or a pinion at right angles to the length of the camera, running in bearings fixed to the base-board, and actuating racks fixed to the moving part of the camera, constitutes the common adjustment for focussing.

The chief difference between them is that the handle for turning the screw is always at the extreme back end of the tail-board; the milled head for turning the pinion is always at one side, generally at the outer end of the base-board. The position of the screw handle, just under the chin whilst focussing, is very inconvenient. On the whole, the rack-and-pinion arrangement is to be preferred. It is not, however, in its usual form, and in its common position—at the extreme outer end of the tail-board—adaptable to cameras of a size over 15 by 12 inches, as it is not possible with these to reach the milled head of the screw. Cameras larger than 15 by 12 are, however, so comparatively seldom used for landscape work, that some special arrangement may be adopted where they are. Thus, I have seen a camera for plates 24 by 18 with a longitudinal shaft with bevel wheels, for communicating motion from a position conveniently under the right hand to the further end of the tail-board.

I think one of the most absurd things I ever saw was the manipulation of a camera that would take plates of about 4 feet by 3 feet, constructed on the Hare pattern. One man did the focussing by turning a handle, such as that of a coffee mill or a barrel organ, whilst another shouted instructions from under a black cloth the size of a blanket.

A very good arrangement, adopted in the case of some American cameras specially adapted for portrait work, in which the *back* moves, is to have a coarse focussing arrangement by hand sliding, after which the back can be clamped down and a farther fine adjustment be given by hand. This saves time, especially in the case of large sizes.

One thing to be observed, whatever nature of focussing adjustment be used, is that it should not be too fine. It might appear, at first sight, that, except in the matter of time taken, the finer the adjustment the better; but experiment shows that the adjustment may very well be too fine. I believe that, in practice, every one focusses by racking the ground glass once or twice, first on one side, then on the other of the best focus, and then striking a mean. It will be found impossible to do this with a very fine adjustment.

I remember deciding to fix a screw adjustment to an ancient sliding body ($8\frac{1}{2}$ by $6\frac{1}{2}$) camera that I possessed, and accordingly I made a $\frac{5}{16}$ inch screw of common Whitworth pitch (eighteen threads to the inch). I was much disappointed to find that I could not focus as well with the new screw as I used to be able to do by hand!

A lever is used in some American cameras for giving the final adjustment. I have no experience of this arrangement; but, considering it theoretically, it seems to me that it ought to be both an efficient and an expeditious means of adjustment.

FIGURES IN LANDSCAPE.

THE writer of a letter in *The Journal of the Photographic Society of India* on the above subject says:—"I do not feel convinced by the passage from Ruskin quoted in the last number of the Journal. If a scene is beautiful as you look at it, though no figures appear, surely it does not cease to be beautiful when photographed because no figures have been introduced. If a story has to be told figures are necessary, but it cannot be necessary to drag figures into every landscape under the penalty of being told if you do not that 'where humanity is not, and was not, the best natural beauty is more than vain.' Why should we not admire 'herbage and stone?' Take the Taj at Agra. You have there both herbage and stone. Will a picture of it be improved by the introduction of such figures as would ordinarily be available—the photographer himself, say, or a guide with a torch? If you are an artist, and can imagine and put on canvas the scene when Mumtaz Mahal was buried, do so by all means; but what can the ordinary photographer do in the way of human figures which will not look poor beside the building? Again, take the illustration you gave in one of the earlier numbers of a view of a mountain peak. You think that the introduction of the climbers in the foreground, as if ready for the ascent, would lend an interest to the picture. If the group is artistically posed, yes; but it would be very easy to spoil a fine view by an inartistic group. When we admire a view it is, I think, as a rule, the view alone, and the human figure does not often add to the pleasure we have in looking at the picture. I have been looking through some old numbers of the Academy and Grosvenor Notes and of the Salon, and find many specimens of pure landscape without figures. I cannot help thinking that, where the view is landscape, it is, as a rule, better not to try and bring in figures."

THE NEW PREMISES OF THE PHOTOGRAPHIC SOCIETY.

AT a recent meeting of the Photographic Society Mr. W. S. Bird said:—In obedience to the powers and authority conferred by a special council meeting, it was determined to try to put in practice, as far as possible, a project which has been long before us—to provide something like a home for the Society. A special committee was appointed first to find, and then to recommend, rooms which they thought suitable. They found some premises in Great Russell Street which, it was considered, would give the comfort and accommodation required, certainly in some limited degree, but sufficient for the present. The premises being viewed and reported on to the council, the committee were authorised to enter into negotiations for the premises, with the result that they have been taken for three years at a rent of £115 per annum; the sum originally asked was £125; in addition to the rent, a sum of 5s. weekly to be paid to an attendant as messenger, and so on. The new quarters are in a fine building of considerable architectural pretension, and exactly opposite the centre of the British Museum, a locality which is fairly central. The rooms are now being furnished, gas provided, and all will be ready for occupation at the end of this month, or the beginning of the next. The only objection to the rooms is the fact that they are on the third floor, but the staircases are broad and easy. The premises consist of one large room capable of holding about sixty persons; a smaller room suitable for a library; a good dark-room; and a smaller one for a similar purpose, with entry and lavatory. The general accommodation is such as will add to the comfort of the members and to the utility of the Society. At present we are waiting the appointment of a new assistant-secretary, and we desire to obtain the services of a young man who could fairly represent photography, and who should have a knowledge of general science, and be master of another language beside his own. He should also have some acquaintance with chemical science, have a taste for art, and be disposed to stick to the Photographic Society. We have two or three candidates in view, but the council desire to announce the vacancy publicly, so as to get the best man available. The duties of the new secretary will comprise attendance on the premises, which will be opened a certain number of hours each day, so as to afford facilities to the members who may desire to use the library or the dark-room, and also have the benefit of consulting the assistant-secretary, who would possess sufficient photographic skill to be of use. We have practically launched into the experiment, but in doing so have been liberally supported by the members, who have subscribed to a guarantee fund to carry out the work without loss to the Society. The guarantee fund now amounts to £147 a year for three years; quite enough, it is believed, to secure the Society from loss during the three years of the experiment.

The President then remarked:—As the treasurer has referred to the new assistant-secretary, I might say that Mr. Cocking had, at the time when it was decided to make the experiment, already sent in his resignation, because attendance being constantly required he felt that it would be impossible for him to be in London every day. Since then, however, he has sent another letter stating that it would be possible for him to attend the Photographic Exhibitions in the future as heretofore.

THE PHOTOGRAPHIC CLUB.—Subject for discussion on December 10th, "Hydrokinone Experiences"; December 17th, "Photographic Playthings."

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—At the meeting held on November 28th (Mr. Bedford, chairman) three applications for assistance were granted, and two new members—Messrs. J. D. Napi and Herbert Rapson—were elected.

NEXT Monday evening, at half past seven, the second annual exhibition of the North Middlesex Photographic Club will be opened at the Jubilee Hall, Hornsey Rise, near London, and not far from Hornsey Road railway station. There will be music and refreshments during the evening, and at nine o'clock a lantern display.

Patent Intelligence.

Applications for Letters Patent.

18,561. G. E. READING, 128, Colmore Row, Birmingham, "Stand for Photographs."—November 18th.

18,723. A. TOBY, 28, Southampton Buildings, London, "Plate Changing Apparatus."—November 19th.

18,734. J. W. Hunter, 28, Norwood Road, Herne Hill, London, "Device for Rocking Dishes."—November 19th.

18,749. J. E. THORNTON, 3, New Lorne Street, Manchester, "Machinery for Printing, Finishing, and Producing Photographs."—November 20th.

18,967. L. J. SELLIER, 6, Bream's Buildings, London, "Photographic Printing Presses."—November 22nd.

19,022. G. H. P. BURNE, Glen Parva Barracks, near Leicester, "Photographic Shutters."—November 24th.

19,049. F. L. MUIRHEAD, 9, Warwick Court, High Holborn, London, "Electric Lighting Appliances for Photography."—November 24th.

19,117. H. A. BENHAM and W. H. TOMSON, 27, Southampton Buildings, London, "Candle Lamps for Use in Photographic Dark Rooms."—November 25th.

19,143. W. H. THOMPSON and P. W. HUSBANDS, 22, Edmund Place, Aldersgate, London, "Hand and Other Cameras."—November 25th.

19,274. A. S. NEWMAN, 31, Southampton Buildings, London, "Regulating Shutters for Photographic Cameras."—November 26th.

19,291. AMY EMILY LUTTICKE, 23, Lansdowne Place, Hove, Brighton, "Magic Lanterns and Slides."—November 27th.

19,327. G. R. MILLER, 18, Buckingham Street, Strand, London, "Receptacle for Use in Developing."—November 27th.

19,331. J. G. HUDSON, 24, Southampton Buildings, London, "Flash-Light Apparatus."—November 27th.

19,358. E. S. NORCOMBE, 97, Islington Row, Birmingham, "Photographic Dishes."—November 28th.

19,402. A. W. SCOTT, 40, Chancery Lane, London, "Producing and Displaying Photographs."—November 28th.

19,480. A. S. NEWMAN and A. L. ADAMS, 31, Southampton Buildings, London, "Shutters for Photographic Cameras."—November 29th.

19,488. E. GUNDLACH, 18, Fulham Place, Paddington, London, "Adjustment for Photographic Objectives."—November 29th.

Specifications Published.

134. *January 3rd*, 1890.—"Azo-colouring Matters." RICHARD JOHN FRISWELL, a Director of Brooke, Simpson, and Spiller, Limited, of Atlas Works, Hackney Wick, Middlesex, Aniline Dye Manufacturers, and ARTHUR GEORGE GREEN, a Chemist to the same firm.

The object of our invention is to effect the preparation of azo-colouring matters from oxyazotoluidine of melting point about 212° Centigrade (see *Limpricht Berichte*, vol. 18, page 1405), by acting on it with nitrous acid, or with a salt of nitrous acid, and an acid, and combining the diazo compound so formed, with amines or phenols, or their sulphonic or carboxylic aids.

The following is an example of the practical operation of our process. 25·6 kilos. of oxyazotoluidine, of melting point 212° Centigrade (*Limpricht*), or an equivalent quantity of the sulphate, or other suitable salt, is suspended or dissolved in water containing a free mineral acid, and diazotised by the addition of 14 kilos. of sodium nitrite (98 per cent. $Na\,No_2$).

The solution of the diazo compound thus obtained is poured into an aqueous solution of 49.2 kilos. of the sodium salt of (1—4) alpha naphthol sulphonic acid (corresponding to naphthionic acid), and kept alkaline until the formation of the dyestuff is complete. The colouring matter is then filtered off and dried.

What we claim is:—

1. The preparation of azo-colouring matters by the diazotisation of oxyazotoluidine, and the combination of the diazo

compound with amines, phenols, or their sulphonic or carboxylic acids, substantially as herein set forth.

2. As new articles of manufacture, the azo-colouring matters, prepared in the manner substantially as herein set forth.

401. *January 9th*, 1890.—"Producing a Flash Light." THEOPHILUS HORNE REDWOOD, Bryn Coed, Crescent Road, Chingford, Essex, Analytical Chemist.

My invention relates to improvements in means or apparatus for producing a flash-light more especially applicable to photography, but also intended for other uses, such, for example, as the production of stage effects.

In apparatus of this class, as ordinarily constructed, magnesium, or other suitable powder, was projected into the flame of a spirit or other lamp in a concentrated stream, and whilst some of the powder failed to become ignited, the remainder, being in a concentrated form, failed to produce a flash of any considerable area.

Now, according to my invention, I cause the powder to enter the the flame in a well separated or diffused condition, and I so arrange the lamp that the complete ignition of the powder is effected.

For this purpose, I employ a tray, or container, for the spirit, or other suitable flame-producing material, and I by preference provide this container with a cover, or grating, of wire gauze, or other suitable material, as is well understood, and, if necessary, with a cone, or like device, to cause an increased draught of air adjacent to the flame.

Starting from the back of, and projecting slightly over, the container, and rising vertically above the grating, I arrange a plate or wall of sheet metal, wire gauze, or asbestos, so that the flame issuing from the grating will be attracted by, and caused to lick, the vertical plate, and thus form a thin wall of fire of considerable area.

If desired, I may employ any other suitable form of lamp in conjunction with the vertical plate in lieu of that form of lamp hereinbefore described, and I may employ coal or other gas as the flame-producing material.

At a suitable angle to the vertical plate, I mount upon a standard a projector, consisting of a nozzle or diffuser, provided with a chamber for the reception of the charge of powder, and I connect this nozzle or diffuser by means of a flexible pipe, with a mouthpiece to enable the operator to blow out the charge, or with an india-rubber ball or small bellows, or other suitable air-holding device capable of easy compression.

By suddenly blowing through the mouthpiece, or compressing the air-holder, the powder will be projected from the nozzle, and by reason of the angular position of the diffuser, in relation to the vertical plate of the lamp, the charge of powder will be distributed over the wall of flame, the vertical plate preventing the escape of unignited particles, and a flash of considerably increased area will thus be produced with but the same expenditure of material as heretofore.

If desired, the powder may be projected upon an intervening deflecting plate, and by that directed into the flame.

What I claim is:—

1. In an apparatus for producing a flash-light, the combination of a lamp or burner, a vertical plate or wall located over, or adjacent to, such burner, and a suitable projector or diffuser for the powder.

2. In an apparatus for producing a flash light, the combination of a lamp or burner, a vertical plate or wall located over, or adjacent to, such burner, a suitable projector or diffuser for the powder, and an intervening deflecting plate for directing the powder into the flame.

3. In an apparatus for producing a flash-light, the combination of a lamp or burner, a vertical plate or wall located over, or adjacent to such burner, and a suitable projector or diffuser provided with a chamber to contain the charge of powder.

10,145. *July 1st*, 1890.—"Photographic Enlargements." MARCUS GUTTENBERG, 232, Oxford Street, Manchester, Photographic Artist.

This invention relates to a novel mirror photo-enlargement or decorating process, whereby photographic, and especially photographic portrait enlargements, coloured or otherwise, can be produced in combination with a mirror background, giving an ornamental and pleasing effect in portrait or landscape photography hitherto unattainable.

In carrying out my invention, I make an enlargement of a negative on a transfer of any kind, either transferrotype-paper or by carbon or other transferring process. The image from the enlargement must be cut out, laid face downwards on the mirror, and the outline of the enlargement be marked thereupon with any desired colour. I then take white or coloured paint or varnish, and paint the surface inside the line and allow the same to dry. This done, I wet the enlargement perfectly in water, and transfer it to the painted surface in the usual manner. I then strip the transfer paper, which now lies uppermost, away from the painted surface, leaving the film adhering to the said surface, and when dried it is ready for painting, either in oils, water colours, monochrome, or it can be decorated according to taste.

It will be obvious that the portrait or picture may be produced upon the mirror either by photography, or painted thereupon by the assistance of photography, say by means of a transparency or negative, either through a lantern or otherwise.

What I claim is:—

1. The improved mirror photo-enlargement process, substantially as hereinbefore described.

2. The improved mirror decorating process substantially as and for the purpose hereinbefore described.

Correspondence.

DIAZOTYPE PRINTING PROCESSES.

SIR,—In reply to the letter of Messrs. Green, Cross, and Bevan, it may be admitted that "Diazotype Processes" is, strictly speaking, a better generic title than "Primuline Processes" under which to include their process and that of Feer, seeing that the latter is not confined to the use of the diazo derivative of primuline, but is applicable to diazo bodies generally.

With regard to their contention that Feer's printing process should be called a "negative" one, and their own "positive," it should be remembered that the ordinary silver printing method for obtaining positives direct from negatives are known to photographers as "positive printing processes," and are found so described as far back at all events as the time of Hardwich. Feer's process, resembling in this respect silver printing, would therefore be understood by photographers as a positive printing process, whilst methods which, like the powder process, and the primuline process of Messrs. Green, Cross, and Bevan, requiring a transparent positive to be produced from the negative before a positive can be obtained from it, should have some special designation. The kind of result, negative or positive, obtained by each process, is, as may be seen, clearly pointed out by Dr. Witt. THE TRANSLATOR.

CHEAP RAILWAY TICKETS FOR PHOTOGRAPHERS.

SIR,—I am glad to find that the photographic press organs, the most powerful guardians of our interests we possess, have taken this matter up, and I feel satisfied that with their assistance, and with the co-operation of the principal camera clubs, the desired end may be obtained. Perhaps the best course to pursue would be to present to the railway companies a petition signed by as many societies as possible, in favour of the cheap ticket system, and showing some real grounds for the desired concession. Railway Companies are business people, and while they are willing to meet the public, they expect some return for all favours granted. It would be desirable to get the number of camera or photographic societies throughout the kingdom, and the total number of their members, with other information that would strengthen our position. The West London Photographic Society would gladly leave the lead in this direction to one of the older societies, if one of them would undertake it; but, failing this, would be prepared to undertake the prepara-

tion of the petition if the other societies would sign it. A united petition, with the Camera Club at its head, would carry great weight, and would no doubt succeed in obtaining similar privileges to those now enjoyed by our brothers of the "gentle" art.

Any information on this subject will be gladly received by our Hon. Sec., Mr. John A. Hodges, 87, Chancery Lane, London.

W. A. BROWN,
President of the West London Photographic Society.

THE UNNATURALNESS OF NATURALISTIC FOCUSSING.

SIR,—In acknowledging Mr. Debenham's courteous recognition of my letter, I am glad to see we are essentially in agreement.

In answer to his invitation to lay before your readers my views on the way in which it appears to me that a just theory of the relations of mental and physical processes in natural vision conflicts with the "naturalistic" theory, I would willingly endeavour to do so, so soon as leisure permits, if you thought it likely to be acceptable to them.

I certainly do not think Dr. Emerson sufficiently recognised how little our distinct visual perception confines itself to that which is—at any given instant—within the area of distinct vision; believing that, in natural vision, it always includes much that has been centrally seen during *successive* instants; only being *supported in the memory* by our less perfect sense of it, while also less perfectly imaged away from the central area of distinct vision. I do not believe in even an "impression" being entirely confined to one indivisible instant of time—and, if not, what hinders a distant perception of the whole scene over which we have cast our eyes? It varies, indeed, in its vividness, or mental distinctness, as the varying direction of our attention calls into both mental and physical action the selecting and emphasizing faculties. So I would willingly take a part in endeavouring to controvert what has already been happily termed the "unnaturalness of naturalistic focussing."

It seems, too, to me to be a wilful throwing away of that delicate beauty of definition—neither sketchy nor laboured—which painters would willingly secure if they could, in deference to an entirely mistaken idea that delicately accurate definition of details is incompatible with their due subordination. Mr. Debenham has well pointed out the misconception arising from the different senses in which the phrase "sharp definition" is understood by painters and photographers respectively; and few misconceptions have been more persistent or more injurious.

Perhaps, however, it is to some extent our own fault. We have so striven after speed, pushed to instantaneity even for still life, and have so accustomed ourselves either to small sizes, for which the softness of contrast which pleases us in a large picture is unsuitable, or else to enlargements, in which its combination with true delicacy of definition is unattainable, that few, even among photographers, adequately appreciate the effect which may be produced in a really large direct photograph which is everywhere delicately and accurately defined, yet so duly subordinated that no undue sharpness of contrast seems to emphasise irrelevant detail. Such effects are to be obtained from a suitable subject with a good lens, a small stop, and a sufficient exposure. But how rarely are they obtained! Some ten or twelve years since, I was asked to take a life-size portrait of a young lady after death. Of course the photograph was sacred, and could be shown only to the sorrowing father. But my memory of the delicate detail, obtained through the small stop permitted by an exposure of forty-five minutes in a good light, on a wet collodion plate which needed no forcing, is one that casts into the shade all I have seen of the efforts of enlargers or retouchers. Such untouched delicacy of detail in a large picture is really truth to nature, and I think it would be so regarded by Dr. Emerson himself.

High Street, Oxford. W. H. WHEELER.

P.S.—Please allow me to correct an error in my last. The conjugate focus of the car for a 9-inch lens at 74 inches distance should be $10\frac{1}{32}$ inches, not $10\frac{2}{32}$. The differences, however, are correctly stated.

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual technical meeting of this Society was held at the Rooms, 15, Dawson Street, Dublin, on Thursday, the 27th ult., with Mr. HERBERT BEWLEY in the chair.

Mr. JAMES CARSON, C.E., gave a demonstration of lantern work, in the course of which he exhibited a number of regulators. He stated, for the benefit of those who might be nervous about using compressed gas cylinders, that the Scotch and Irish Oxygen Company subjected their cylinders to some severe tests, and in addition they had them constructed respectively with right and left threaded screws, thus rendering it a matter of impossibility for a careless workman to fill an oxygen cylinder with hydrogen, or *vice versa*.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 27th.—Mr. T. E. FRESHWATER in the chair.

Mr. F. H. VARLEY read a paper on the "Magazine Camera," invented jointly by himself and Mr. Friese Greene. Subsequently Mr. Varley explained the mechanism of the camera by the aid of the blackboard. The camera is capable of making fifty exposures per second, but five per second were found to be a very good average; 400 exposures had been taken on one band of tissue.

Mr. FRIESE GREENE showed a roll of bromide paper which had been printed at the rate of five per second. Mr. Greene also explained a process, yielding an imitation of opal printing. Plain glass plates are coated with an emulsion containing kaolin and baryta. The plates are developed and fixed in the ordinary way. When finished they have the appearance of opal glass.

The CHAIRMAN passed round Mr. Andrew Pringle's new work on the "Optical Lantern," published by the Scovil Manufacturing Company, New York.

THE WEST LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the above Society was held at the Broadway Lecture Hall, Hammersmith, on November 28th; the president, Mr. WALTER ADAM BROWN, occupied the chair.

Mr. PRINGLE gave an address on "Bromide Printing." The lecturer, after describing the details of the manufacture of the paper, proceeded to say what a bromide print ought to be. Experience shows that many do not know what constitutes a perfect bromide print. The best test of the quality of a bromide print is that it shall look like platinum at its best. The great advantage of the process is, that whereas a special quality of negative is required for platinum and for silver, a negative unprintable by other methods will yield a passable result with bromide. Other advantages are that the process can be worked at night, therefore light and exposure are under perfect command. In regard to exposure, no definite rule can be laid down, owing to the want of a standard light. Working with a normal developer, a black and white print means under-exposure, and if the finished print be of a greenish or muddy tone, the developer had not time to act properly. Ninety per cent. of failures are due to too rapid development consequent upon over-exposure; the great point to aim at is the control of development. A long exposure tends to yield softness, and if carried too far to fogginess; chalk and soot mean under-exposure. With a thin negative a sub-normal exposure should be given; if hard, super-normal exposure should be given. A developer strong in iron means strong blacks. If the print is from a thin negative, the exposure should be short and the developer strong, and *vice versa*. It is hard to find a better developer than ferrous oxalate. He could not speak so well of pyro or eikonogen, but quinol gives good results. Both the iron and the oxalate solutions should have slightly acid reaction. His method of making iron developer was as follows: Before mixing, acidify the water with sulphuric acid, and then add the iron to saturation, but do not boil. The oxalate solution is

also to be saturated and acidified with oxalic or acetic acid. As to proportions, for a strong developer, 1 iron to 4 oxalate ; medium, 1 to 6 ; a good strength being 1 to 8. He did not recommend diluting the developer with water, as it engendered graininess. As to the use of free bromide, half a grain of it to an ounce of water was a usual quantity, and he advised that. As to quinol, he recommended Thomas's or any standard formula. In regard to manipulation, the paper should first be soaked in clean water, then sweep over the developer, and keep moving. The test of proper exposure is the regular appearance of the image ; by the time the details show in the high lights the shadows should be plucky. With rough paper, development should not be carried too far, as the print, when dry, looks darker. Thorough washing should follow the use of the acid bath. It is important to keep the hypo alkaline by the addition of a little ammonia, as there is a great tendency for the bath to become acid. If blisters appear, a little salt in the first washing water overcomes the difficulty. He recommended the use of a squeegee under a rose tap, which is more efficacious than prolonged soaking in a washer. Mr. Pringle concluded his remarks by practically demonstrating the process.

The next meeting, which will be a lantern night, will take place on December 12th.

The Hackney Photographic Society.

The thirty-sixth ordinary meeting of the above Society was held on the 27th ult.

The Hon. Sec. reminded members of the Exhibition on December 11th. The awards in the competition, with Messrs. J. Traill Taylor and H. P. Robinson as judges, were :—Best picture taken at a Society excursion—Dr. Gerard Smith ; 2nd, Bronze medal—Mr. W. G. Linadell. Best Seascape—Prize (Mr. Crouch's donation of a lens), Mr. W. Wesson. Architecture—Silver medal, Dr. Roland Smith ; Bronze, Mr. F. H. Evans. Beginner's Prize—Bronze medal, Mr. F. W. Cock. Lantern Slides—Microscopical, Dr. W. A. Kibble ; Artistic, Mr. J. Carpenter. Isochromatic Prize—Given by Messrs. B. J. Edwards and Co., Dr. Gerard and Dr. Roland Smith. Nearly 200 pictures were sent in, and 66 entries were made. The gold medal or championship of the Society was won by Mr. Walter Wesson, for a fine picture of "On the Wye." There were some good pictures entered : the judges were pleased with the efforts of this young Society.

A subscription was set on foot to purchase a lantern. It is expected that the new lantern will be ready for use at the Exhibition. The hon. sec. presented the Society with a book on "The Lantern," by Chadwick, and the president gave a lime-light jet.

Some work having been shown by Messrs. Gosling and Dean, the Chairman (Mr. J. O. Grant) called on Dr. Roland Smith for his demonstration on "Kallitype Paper."

Dr. Smith said that the paper is similar in appearance to platinotype paper, but is more under control, as the development can be stopped in any part or at any moment easily. It is, he said, quite a permanent process, and yields prints in about a quarter of the time which silver paper takes. The paper does not require any special way of keeping ; it is, however, desirable that the fingers should be kept off it, as much as possible, whilst developing, or stains might result.

Leicester and Leicestershire Photographic Society.

On Wednesday, November 26th, the first conversazione was held at the Co-operative Hall, High Street, when several of the members showed selections from their work.

Among the photographs exhibited were those of Mr. G. Bankart, a collection of autotype and platinotype prints, of which "The Old Corporal" was specially worthy of note. Mr. T. Scotton, of Derby, showed a number of splendid views in the engine works of the Midland Railway, taken direct on the largest sized plates manufactured, and a good negative of one of the locomotives was exhibited. Mr. F. G. Pierpoint, in addition to prints, had several exhibits of interest, including transparencies, lantern slides, photographic lamp shade, and sets of apparatus. He also displayed a fine bromide enlargement (40in. by 30in.) of a view near Matlock, Bath. An interesting collection of figure studies was displayed by Captain Adcock, of Melton Mowbray. The other exhibitors were Messrs. S. S. Partridge (president), J. S. Cooke (vice-president), aristotypes and bromides ; B. Ellis, F. Joliffe, Woodcock, J. Porritt, enlargements ; A. Wilson, W. Taylor, S. Squire, and Frank Brown. Mr. Weatherhead also placed on view a selection of works of art, antiquities, and objects of interest in foreign manufacture.

During the evening a lecture was given by Mr. Walter D. Welford on "Hand-Camera Work," illustrated by a large number of slides from instantaneous exposures on almost every kind of moving object. The views were of a novel character, illustrating every form of hand-camera work, and they were shown by a bi-unial oxy-hydrogen lantern worked by Mr. Pierpoint.

Birmingham Photographic Society.

The sixth annual meeting was held at the Club Rooms, Colonnade Hotel, Birmingham, on the 27th November, Mr. J. B. Stone, J.P., in the chair.

The Secretary read the report of the Council, from which it appeared that steady progress has been made by the Society during the year 1890. Notwithstanding the removal of eighteen members' names, owing to resignations and non-payment of subscriptions, the register roll has increased from 171 in 1889 to 176 in 1890, twenty-three new members having been elected during the year 1890. The Annual Exhibition of 1889, unavoidably postponed till January, 1890, and held in the Temperance Hall for two days, was a great success, nearly 400 photographs, the work of the members, all taken during the year, and prepared specially for competition at this Exhibition, being shown on the walls. The attendance was large. A number of the competing photographs shown at this local exhibition were forwarded to the Crystal Palace Exhibition, held in March, 1890, to compete in the "Society Competition for the All England Challenge Cup," and the prize was awarded by the judges to the Birmingham Photographic Society. On February 7th, 1890, Mr. S. G. Mason offered a gold medal for special competition, the prize to be given for the best set of six photographs of cottages and river scenery in Warwickshire (the negatives to be at the service of the County Photographic Survey Council), and the council in addition offered a silver medal for the second, and Mr. A. Constantine a bronze medal for the third best set. The photographs were forwarded on July 10th, 1890, to Mr. George Bankart, of Leicester, who was elected judge by the council, and he gave his awards as follows :—Gold Medal, B. Karlese ; Silver Medal, A. J. Leeson ; Bronze Medal, W. J. Harrison. The Photographic Survey of Warwickshire, particulars of which have been given from time to time in these columns, was also referred to at length in the report of the council.

The Librarian's Report showed that members have made good use of the library during the past year, and the Curator of Lantern Slides reported that the stock slides had been fairly well distributed during the year, having been issued to about fifty members, and selections lent to the Camera Club, London, and to the Coventry and Kidderminster Societies. The Society has acquired a first-class bi-unial lantern and accessories.

The Chairman, in moving the adoption of the report, said that if the Society had only done one thing, viz., placed the Photographic Survey of Warwickshire on a firm basis, it could certainly congratulate itself. He was looking forward to the Exhibition to be held in December, when a good number of the survey prints would be shown. He believed in intercourse amongst members, and wished to encourage the publication of receipts and results of the experience of members who knew the best ways of doing things. It would be a good thing if the best results were made more common in the Society. Trade interests would not suffer, but it would facilitate trade interests, as traders would then know what to provide. There were, too, many matters the Birmingham Society could congratulate itself upon, one of the foremost being the winners of the National Challenge Trophy, which, with specimens of the

work which gained the cup, was placed in the Birmingham Municipal Art Gallery.

Mr. Karleese seconded the adoption of the report, which was carried unanimously.

The following officers were then elected:—*President*—Mr. J. B. Stone, J.P., F.L.S., F.L.S.O.; *Vice-Presidents*—Messrs. W. J. Harrison, F.G.S.; E. H. Jaques; B. Karleese; *Hon. Treasurer*—Mr. T. Taylor; *Hon. Librarian*—Mr. W. S. Horton; *Hon. Secretaries*—Messrs. J. H. Pickard and A. J. Leeson.

The Liverpool Amateur Photographic Association.

The 27th annual meeting was held in the Association's Club Rooms, 3, Lord Street, Liverpool, on Thursday evening, 27th November. The President, Mr. Paul Lange, occupied the chair, and there was a crowded attendance of members.

The following were elected members of the Association, viz., Messrs. A. Hutschauney, Harold King, Alexander Watt, R. P. Gilbertson, W. Stone, E. L. Marriott, Howard Arnold, M.D., T. S. Pardy, and W. B. Hellor. The Hon. Secretary's report showed that during the past year the addition to the roll of membership had been the largest in the history of the Association with the exception of the year when the club rooms were opened, and that fifteen members had retired from various reasons, and additions of fifty-five new ones had to be recorded, making a total of 279. The sucess attending the practical demonstrations, of which there had been eleven, was encouraging, the average attendance being about forty. There had been eleven monthly and three optical lantern meetings, also five outdoor excursions, all of which had been well attended.

The report was unanimously adopted.

The Hon. Treasurer's financial statement showed that the total expenses in the year's working had been £224 1s. 1'd.; the income had been £207 16s. 2d.; there was, however, a balance of £361 18s. 11d. to the credit of the Association.

After a discussion on some minor points, the statement was adopted. The Council submitted the following nominations for officers, &c., for 1891:—*President*—Mr. Paul Lange; *Vice-Presidents*—Mr. Wm. Tomkinson, and Mr. Joseph Earp; *Hon. Secretary*—Mr. L. M. Tunstall; *Hon. Treasurer*—Mr. P. H. Philips; *Librarian*—Mr. J. Macdonald Bell; *Auditor*—Mr. Arthur Bradbury; *Trustees*—Messrs. Paul Lange, Joseph Earp, and A. W. Beer; the following to fill the place of retiring members of the Council—Messrs. A. F. Stanistreet, Henry Lupton, F. B. Illingworth, B. Boothroyd.

The Enfield Camera Club.

A meeting of this Club was held on the 19th ult., Mr. D. G. Pinkney, president, in the chair.

Mr. H. F. Knight read a paper on "Exposure." He regarded correct expasure as not secoud to correct development. Without trespassing upon the ground which belongs more properly to development, he pointed out that the two things were closely allied. You may give a laudscape an exposure of a second, and, with similar conditions in every respect, you may give three seconds, or even ten, yet develop the plates in such a way that the negatives shall, in all cases, be practically alike. The operator should know beforehand what the correct exposure for the subject should be, aud that it should not much exceed in duration the time quoted for the shortest of the three exposures. Many people systematically over-expose their plates, and use a highly restrained developer weak in alkali, thus, practically, taking away with one hand what they give with the other. Mr. Knight differs *in toto* from such a method, and believes that the proper course for the landscape photographer is to adopt such a means of development as will enable him to get equally good results as to the value and toue with rapid exposures. Many, if not most, pleasing effects in nature are more or less fleeting or restless. The sea is moving incessantly; the breeze is often sporting amongst the foliage; cattle are seldom stationary for long. Many of the figures one sees artistically introduced into landscape photographs are the result of quick exposures, such as that obtained with an ordinary drop shutter; therefore, given a rapid plate and an energetic developer, and being prepared to give a quick exposure, it is more than ever necessary that the exposure soould be correctly timed. He advised, according to his own practice, to aim at what may be called the shortest possible adequate exposure, and not to trust, as many do, more or less, to haphazard in exposure to rectification in development. He said that broadly speaking, there were three ways of arriving at correct exposure for a given subject under certain conditions, and they are: 1st, by experience; 2nd, by tables; 3rd, by a judicious mixture of the two. Many photographers abuse tables in theory, and it is the way of some beginners to abuse them in practice; for instance, an amateur, who, having set up his apparatus to take a view of the interior of Tiutern Abbey (a roofless ruin), turned to his tables and found two minutes down for a well lighted interior. The exposure was given, but the result did not come up to the expectations of the would-be photographer; therefore acquire experience, and use it together with your tables. There are seven different factors which help to determine the length of an exposure, viz.: lens, stop, plate, time of day, time of year, nature of subject, and light, whether cloudy or otherwise. Mr. Knight examined the seven factors in detail, and proposed to endeavour to express them in figures. For this purpose he adopted a unit, and the unit selected is that the exposure for an open landscape in sunshine at 12 o'clock in June, with a stop marked *f* 10, and a collodion wet plate, is one secoud. For the purposes of exposure the factors of lens and stop can be dealt with together, aud represent theu by figures which shall be universally applicable, *f* 10 representing the figure 1, *f* 8 will be represented by $\frac{2}{3}$; *f* 16 by $2\frac{1}{2}$; *f* 22 by 5, and so on. In a series of stops as usually supplied with the lens, each size smaller requires double the exposure of the next one to it. The next factor is the plate used: it is better for the purpose of experiment to take some well-known plate as a standard instead of wet collodion. Thus Ilford ordinary are twenty times as rapid as the unit. Mr. Knight invariably uses Messrs. Wratten and Wainwright's drop shutter plate, which he considers a fifty-time plate, and is two and a half times faster than an Ilford ordinary. The uext factor is time—time of day, and time of year. The reader went on to say that it would be neeessary to conduct some experiments here, except that it has all been done effieiently for us by Dr. J. A. Scott, and is set out in his well-known table, which he produced:—

Dr. J. A. Scott's Table.

Time.

Hour.		June.	May. July.	April. Aug.	Mar. Sept.	Oct. Feb.	Jan. Nov.	Dec.
12		1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$3\frac{1}{2}$	4
11	1	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	4	5
10	2	1	1	$1\frac{1}{4}$	$1\frac{3}{4}$	3	5	6
9	3	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	4	12	16
8	4	$1\frac{1}{2}$	$1\frac{1}{2}$	2	3	10		
7	5	2	$2\frac{1}{2}$	3	6			
6	6	$2\frac{1}{2}$	3	6				
5	7	5	6					
4	8	12						

Mr. Knight had had considerable experience with the above table, and believes it to be very reliable, and must have been the result of very large experience, and said that anyone who trusts to his eyesight to determine the intensity of light in preference to adopting such a table as the above, puts himself to a considerable disadvantage. The last two factors—viz., nature of subject and quality of light—without reference to the time, are left open to be judged by experience. He advised the taking of the subject and the light together, and to accustom oneself to decide upon the ratio or number required for any subject that may present itself. Thus, an ordinary landscape subject with strong foreground lighted up by the sun should be taken as four. If the light were good, but not actually sunshine, he would double the figure and take it as eight, and so on. If one gets a little bit shut in by trees, the length of exposure required rapidly increases, and you quickly get to ten, or even twenty or upwards; whilst if you have a river scene or open landscape, one or two

would be sufficient, aud for clouds or sea a half or even a quarter. Mr. Knight was only referring to laudscape and outdoor photography, aud said that tables are not of much use for indoor work, or for copying, and went on to say that there are different ways of putting his theory into practice; for instance, supposing he were going to photograph Old Chingford Church at 10 o'clock on a sunny January morning ou a Wratten drop-shutter plate, and as there are tombstones, and so forth, in the foregrouud, which it would be desirable to have pretty sharp, he would use *f*/22, a stop requiring five times the exposure of the unit, viz., *f*/10. The plate, being a fifty-times oue, will require fifty times the exposure of the unit wet collodion. For the time of day, he refers to Dr. Scott's table, and finds five given; then, taking the last two factors together, subject and light, there is a strong foreground, and a bit of a dark yew tree in the middle distance, and four would be the proper ratio to take, or four times what would be required for the unit of open landscape; put in the form of fractions, the figure for the plate being the denominator, and the others numerators, it would be $\frac{5}{1} \times \quad \times \frac{5}{1} \times \frac{4}{1} = 2$ seconds. He had a much simpler way of goin[5] to work. He had prepared a table which, for one quality of plate, and one size of aperture, meets all cases without much calculation.* Mr. Knight ended with saying that the appearance in the focussing screen may, and ought to, be useful iu determining the ratio for subject aud light, and even au actinometer might be used by those who are addicted to such things. For his part, he found a minimum of experience and common sense, which is all he can lay claim to, quite sufficient for what is required.

The evening closed with a unanimous vote of thanks to Mr. H. F. Knight.

THE GREAT YARMOUTH AND EASTERN COUNTIES PHOTOGRAPHIC SOCIETY.

THIS Society held its secoud monthly meeting on Tuesday evening last, at the Friendly Society's Hall, Great Yarmouth. There was a good attendance of members and friends.

After the ordinary busine·s had been transacted, and several new members elected, an exhibitiou of lantern slides (prepared by members only) was proceeded with, and about sixty slides were projected upon the sheet. Each member described his owu slides, aud explained the method of preparation.

THE NOTTS AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE 101st ordinary meeting of this Association was held on Monday evening, Dec. 1st, at the Society's Rooms, Cavendish Chambers, Market Street, Mr. S. WELLS, president, in the chair.

The followiug new members were elected:—Messrs. Zalasiuski, Marsdeu, and George Turner.

Mr. BURROWS gave notice of motion that the sons of members under eighteen years of age be admitted as members at a reduced subscription.

Mr. H. M. SMITH, of the Eastman Compauy, gave a practical demonstration on bromide enlarging, and exhibited a folding camera.

The Society is about to enter into possession of more commodious rooms, which are undergoing thorough decoration.

H. P. ROBINSON.—Your letter is based upon an erroneous impression. The names of yourself aud Mr. Whartou Simpson were not mentioned in our notice of *Sun Artists* last week, nor even for a moment thought of in connection with the matter.

THE PHOTOGRAPHIC NEWS "YEAR-BOOK."—Our YEAR-BOOK for 1891 is now out, and contains many more pages of literary matter and informatiou relating to photography than did its predecessor; it also contains much informatiou about the diazotype processes, and about other discoveries made during the past year. Some of the engravings in it are of exceptional interest, and it contains some tables of figures likely to be useful to photographers.

* This table of figures has been received indistinctly written, so that it cannot be printed without the introduction of errors.—ED.

Answers to Correspondents.

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

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

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

G. D. (*Paris*).—Received your letter, which shall have our best attention, and you may expect an early reply by post.

J. C. M.—*Corroded Lens-Mount.* The black stain caused by long contact with a vulcanized rubber ring is sulphide of copper formed by the slow action of sulphur upon the surface of the brass mount. This kind of corrosion will not yield to anything short of buffiug and re-lacquering.

MET.—*The Cold Weather.* During the last week of November, a sharp transition from very mild and genial weather to hard frost occurred, and the thermometer, which had been standing at about 60° F. on Sunday, 23rd ult., made a sudden descent to 20° F. There was a heavy fall of snow, in London, on Friday, 28th, which covered the ground, and remained on the roofs for many days. Such severe weather, early in the season, has not been known since 1879.

U. P.—*Instantaneous Shutters.* For use between the lenses you have the choice of several good patterns, but these must, as you say, act as diaphragms of constantly varying apertures.

AMICUS.—*Want of Rigidity.* There are two methods, either of which may be employed. Your tripod top should be covered with leather, or a stout leather washer used on the clamping screw, as metal to metal often fails to give the requisite degree of stability. On other points, see Professor W. K. Burton's article on page 840 of the NEWS for the end of October.

A correspondent would be glad to know where he can procure Parts I. and II. of "Royal Academy Pictures, 1890," which are now out of print.

L. E. D.—*Plate Mark Boards.* These can be had in various tints, and all sizes, from any of the dealers. The lithographed ground is likely to preserve rather than injure the photograph mounted thereon. Platinotypes are undoubtedly permanent, and good silver prints should last for twenty years, or longer, if kept in a dry place.

T. SEARE.—We cannot very well undertake to give advice about investments. Make your own enquiries of the secretary of the company, about dividends paid during the last few years, amount of reserve fund if any. Ask for a list of directors, last report, and then use your own judgment on all the facts of the case.

A. G.—The date is too recent to permit of your getting a sight of the patent specification.

LUTON.—*The New Institute.* The details of the proposed Photographic Institute are open to discussion at the December meeting of the parent society, but the time given to it must be short, for on the same evening a paper is to be read on "Astronomical Photography. When the charter of incorporation is obtained, an examination will admit to the title of F.I.P., or F.R.I.P. If you cannot attend the next meeting, you might still be able to send on a few suggestions or criticisms to the secretary.

IRIS.—*Barton's Buttons.* These are getting rare and scarce. The catalogue of the effects of the late Dr. Percy made mention of two or three of them, but they were withdrawn before the day of auction sale. Messrs. Murray and Heath and Mr. Ackland were at one time collectors.

F. G.—*Engraving a Portrait.* In a recent action at law, instead of bringing the President of the Royal Academy and other eminent artists into court, to say whether the nose and mouth in Professor Owen's engraved portrait were faithfully reproduced, it would have been easy to take photo-transparencies of the original painting and engraved copy, and see whether they would fairly overlap. Such evidence would have been admissible.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE PROPOSED PHOTOGRAPHIC INSTITUTE.

PARTICULARS about the proposed Photographic Institute have already been published in these pages, and last Tuesday night the subject was again brought under the notice of the Photographic Society, as recorded to-day in another column. The main fact seems to be that, if photographers band together, and through existing organisations, or otherwise, show interest in the matter, and will contribute adequately towards the carrying out of the scheme, upon which the Lord Mayor looks with favour, it is likely that donations amounting to about ten thousand pounds will be forthcoming in the city of London.

A lamentable difference between first-class scientific educational establishments in England and those in some of the other European nations, is the high cost to the students of the teaching which they receive. In Brussels, the walls are sometimes placarded with bills, announcing a course of free lectures on photography in the Old Museum, to be given by the State Professor of Photography, and pointing out the use of the acquirement, and stating that all those who wish to attend can do so after merely signing their names and addresses in a book. If some of them afterwards wish to go more deeply into the subject, they are allowed the use of costly apparatus on the premises, on condition that they make good any damage they may do to the said apparatus, which includes a photo-spectroscope of great cost, and appliances for high-class scientific, as well as ordinary, photographic work. The theory is, that what belongs to the nation is for the use of the nation, and not almost exclusively for the use of a few salaried officials in the shape of professors.

In Switzerland, at the Government Polytechnic Institute at Zurich, for the sum of one hundred francs a year, or four pounds, the students who can pass the preliminary examination can attend for three years for full instruction in one of the learned professions, such as engineering, architecture, forestry, or chemistry; that four pounds is calculated to about cover the cost of the materials they use. Dr. Lunge, one of the greatest authorities on alkali manufacture in Europe, is the professor of chemistry there, and much in relation to photography necessarily falls within his department. Switzerland spends a larger proportion of its revenue in education than does any other nation in Europe; consequently, when its young men go abroad, say to the Far West of America, they can often get employment when their Anglo-Saxon competitors fail. All other things being equal, the best educated nation will be the most powerful nation, and in the good education of the people rests most of the great strength of foreign competition.

In Germany and Switzerland, a young man is not thought to be at all well educated unless he can speak two or three foreign languages. One effect of this is the comparative ease with which Germans can get employment in England, against those natives of this country who are unable to do the work. Education is of more real value to the individual than money. It also causes a vast reduction in crime, as already proved in England during the last twenty or thirty years, since the nation began to do something in the way of the general instruction of the population.

Government aid in relation to the proposed Institute in London will, of course, not be obtainable. There is much to be said for and against the Government taking up such schemes, and Professor Huxley once expressed at Norwich his opinion that science and its branches should not be fossilised by being largely placed under the control of a State Department. All who took part in the discussion, both for and against Professor Huxley's view, agreed that in such a Department there would be "jobbery," but his opponents thought that it would be better to have the jobbery than to go without the State Department. The proposed Photographic Institute, however, can scarcely be included in the subject of the endowment of science; it is more one of the series of questions relating to the education of the people.

THE London Chamber of Commerce is now taking active steps in the matter of copyright law. Those interested should write to the secretary.

COPYING BY ARTIFICIAL LIGHT.

PHOTOGRAPHERS are often called upon to copy drawings, prints from books, old documents, and things of a kindred nature, and they naturally depend upon daylight for executing the work. But in these dull wintry days it is often impossible, in London and large towns especially, to command sufficient daylight for the purpose, and even if it be not foggy, and the atmosphere should for a time lose its yellow colour, the light is so uncertain from minute to minute, that many plates are lost in the endeavour to get that precise exposure which is so necessary for the production of a negative of the black and white order. The work, too, is generally wanted in a hurry, so that it cannot be put aside for a more convenient season, and particularly is this the case when the negatives are required, as they constantly are at this time of year, for lantern slide production.

Last week was a good sample of dull depressing weather in London, and it so happened that we required a number of diagrams reproduced in the form of lantern slides. Seeing the impossibility of producing the necessary negatives by daylight, as morning after morning turned out to be foggy, we resolved upon making a few experiments with artificial light, a brief account of which may prove useful to those who find themselves in a like dilemma, or who have little opportunity for such work until after sundown.

The diagrams which we had to copy were of two kinds, one set being bound up in an octavo volume, and the others (loose) of quarto size or thereabouts. We resolved to commence on the first, and determined to try paraffin lamps as the source of light. We used a quarter-plate camera, which was placed on a board travelling between grooves in front of the upright easel against which the open book was fastened, and we employed slow plates rich in silver. The lamps, with cardboard screens, which served both as reflectors and shields to prevent the direct light from the flame entering the lens, were placed one on each side of the open book, and as close to the page to be copied as possible. The lens employed was of the portable symmetrical type, stopped down sufficiently to give a sharp image to the corners. Focussing was effected without difficulty with the aid of a magnifier, and an exposure of three and a half minutes gave a negative which showed lines of clear glass on a dense background. One after another the negatives were copied from the book with such certainty that the work became somewhat tedious from the mechanical regularity with which they were turned out.

We next tried the effect of illuminating the diagrams with batswing gas burners, and found that the exposure required was a trifle longer. But the gas presented a great convenience in the readiness with which the two burners—fed from one source by means of a T-piece—could be turned up and down, for development was conducted in the same room as the exposure. In using the paraffin lamps, the light could not be turned low enough without the constant risk of extinguishing the flame altogether. We found that by using gas lamps fitted with albo-carbon burners the exposure was immediately reduced by about thirty per cent., but there was no other advantage in their use.

We next had to deal with the larger diagrams, and to get a sufficiently sharp image the lens had to be fitted with a smaller stop, and as the negative had to be reduced to the same size as those already made, the camera had to be moved to about double its former distance from the easel. The greater size of the diagrams also necessitated increased separation of the two burners. The illumination of the image on the ground-glass screen was, under these conditions, very poor indeed; moreover, the centre was not so well lighted as the sides, a fact that was registered by the first negative which we made. We at once saw that the plan which had served well for the small work would not do for the larger diagrams, and we determined to look for a better luminant.

With a little trouble, another T-piece was connected with a bottle of oxygen fitted with a regulator, and two blow-through lime jets were made to replace the gas lamps. After one or two trials, the right exposure was found to be thirty seconds, using the same lens and stop which we had attempted to employ just before, and the whole of the diagrams were now very quickly reproduced on glass. Having a spare plate in one of our dark slides after this work was done, we tried the experiment of photographing one of the large diagrams with a single lime jet. We did not alter the position of the jet, but let it remain at one side of the copy. To the eye it seemed as if the diagrams were well and evenly illuminated, so bright did it seem in the flood of white light that proceeded from the incandescent lime. But the negative taken told a different tale altogether, one side of it being dense, and that density gradually falling off towards the other side, which was far too thin to yield a good print. A better proof of the truth of the well-known law that the intensity of illumination on a surface is inversely as the square of its distance from the source of light could hardly be demonstrated.

THE ROYAL INSTITUTION.—The following are the lecture arrangements before Easter:—Professor Dewar, six Christmas lectures to juveniles on "Frost and Fire"; Professor Victor Horsley, nine lectures on "The Structure and Functions of the Nervous System" (Part I. "The Spinal Cord, and Ganglia"); Mr. Hall Caine, three lectures on "The Little Manx Nation"; Professor C. Hubert H. Parry, three lectures on the "Position of Lulli, Purcell, and Scarlatti in the History of the Opera"; Professor C. Meymott Tidy, three lectures on "Modern Chemistry in relation to Sanitation"; Mr. W. Martin Conway, three lectures on "Pre-Greek Schools of Art"; Lord Rayleigh, six lectures on "The Forces of Cohesion." The Friday evening meetings will begin on January 23rd, when a discourse will be given by Lord Rayleigh on "Some Applications of Photography"; succeeding discourses will probably be given by the Lord Justice Sir Edward Fry, Professor J. W. Judd, Professor A. Schuster, Dr. E. E. Klein, Mr. Percy Fitzgerald, Dr. J. A. Fleming, Dr. Felix Semon, Professor W. E. Ayrton, and others.

THE DIAZOTYPE PROCESS.

The latest news about the diazotype process, as made known last week at a meeting of the London and Provincial Photographic Association by Messrs. Green and Bevan, who in turn addressed the meeting, is that by means of facilities given to them by Captain Abney in his laboratory, it has been found that the maximum intensity of the action of the spectrum upon diazotised primuline nearly corresponds with the blue lithium line. Nevertheless, the action is strong in the yellow, and this permits the printing by light to a great depth in fabrics; on one occasion they had printed an image by one exposure through six superimposed pieces of sensitised cotton cloth; of course the images decreased in intensity and quality in the lower layers. The fact that the printed image does not interfere much with the passage of light to the sensitive substance below, they consider to be a valuable feature of this new mode of printing. They have not yet succeeded in getting a white background, but hope to do so hereafter; they have, however, discovered a means of changing the pale primrose colour of the background to pale green, and this, they think, may be of use for certain artistic purposes. When they want to "undevelop" a developed image, so that, by means of another solution, it may be brought out a second time, but of a different colour, they soak the print in a hot solution of hydrosulphite of soda, made by pouring a hot solution of bisulphite of soda upon zinc filings, and then giving a good shaking to the containing vessel. At the meeting, they demonstrated the effects of over-exposure by showing that the brilliant displays of colour obtained when the exposure has been right are almost entirely absent when the action of light has continued too long.

INSTANTANEOUS PHOTOGRAPHY.*

BY JAMES MEW.

The exact and proper length of exposure in instantaneous photography is indeterminate. The clear indication of objects in motion depends mainly on the rate of motion. Persistence of vision is found to be variable in different subjects. It may be taken generally to amount to one-eighth of a second. It has been argued from this that an exposure should not be shorter than that quantity of time. The argument is invalid, because the motion of the eye is not taken into the reckoning; but it has been stated on very excellent authority that an exposure of one-eighth to one-tenth of a second is the most suitable for the majority of so-called instantaneous manipulations.

Mr. C. Benuett, in 1878, photographed successfully a bouquet of flowers after it had been watered. In this picture the falling drops from leaf and bloom were distinctly perceptible.

An interesting series of instantaneous photographs of a lance thrower was published in the Photographic News of August in the previous year, which had been taken from the *Photographische Correspondenz*. And in the next year is an account of fourteen negatives taken in San Francisco during the progess of a back-somersault. The pictures of the lance thrower, which were the work of Ottomar Anschutz, are twelve in number, and are full both of scientific and artistic interest. They show the muscular action of the human body under severe strain, and form a pleasing group for the contemplation of the painter. But as a rule, positions in which animals never appear to the sight of the public are to be avoided by artists. This was conclusively demonstrated by the series of extraordinary shapes published some few years back by Mr. Muybridge, of San Francisco. They were actually representations of a trotting horse, Occident—his name is worthy of record—moving at the rate of thirty-six feet in a second, but the difference between the real and actual, and the conventional and ideal movements of this animal was deep and wide. The horse did not, indeed, resemble, as was said by an imaginative critic, "a monster and chimera dire." The outlines remained still exact, but instead of the fore legs being extended more or less horizontally, they were commonly collected and involved in knots of considerable intricacy, and suggested not so much a trot as a fall through the air, a painful colic, or a sudden attack of the staggers. The pictures of the Californian artist showed a marvellous succession of weird and convulsive leaps, though at no time of the transit were all the four legs of the beast lifted together from the ground. The exposure of the negative was less than one thousandth of a second. The photograph was retouched. Had painters and sculptors accepted these attitudes of the horse, however consistent with the eternal veracities, their arts would have become revolutionized with a fell and uncanny result.

In the superior classes of police offices there exists, we are told, a peculiar picture gallery, representing the portraits of the varied criminals known to the force. Evil-doers, from the petty thief who filches a turnip to satisfy his hunger, to the parricide who assassinates, with circumstances of peculiar atrocity, the mother who has sold all her having to supply his needs—sinners who stand on precisely the same footing according to the stoic creed—are, without respect of persons, assembled and gathered together here. To supply the needs of this Nigaristan of felony, instantaneous photography may be fairly used. It is difficult, in fact, without a device of this kind, to take the portraits of these people, although at the expense of their country, and for their country's good. You shall have a naughty person assume—supposing him to be aware that the eye of the camera is upon him—as many forms as the sea god Proteus.

Every reader is probably acquainted with that funny picture of Luke Fildes entitled "The Bashful Sitter," in which a brawny prisoner is held down by a posse of warders and police constables, in order to obtain from him a recognisable portrait. In a case of this kind the instantaneous process comes as a boon and a blessing to the vexed officials. It adds, without any appreciable loss of time, or labour, or money, a capital likeness to the pinacotheca of public scapegoats. But instantaneous photography is not always justified of her children. Where, for instance, it is applied to the detection of a lover's kiss—strictly a private concern—or to the unveiling of the disposition, as shown by the features of a respectable member of the cloth struggling with a refractory and fractured umbrella on a day of wind and rain, and to the subsequent publication of both these incidents of our social life and manners, it seems to desert its proper and

* Concluded from p. 942.

legitimate field of action, and to trespass upon that of those fashionable journals which batten upon the private affairs of a family as communicated by the scullery-maid, to whom they have been whispered by the cook, who has received them as a sacred deposit from the footman, and do what lies in their power to vitiate the taste of a backsliding people, which it should be their highest pleasure, as it is their bounden duty, to raise and to reform.

Instantaneous photography is a commonly attractive bait. Whether it be that the operation is easy, or whether it be a consequence of the desire which is said to animate the minds of the present generation of doing everything in a hurry, may be left for the speculative philosopher to determine. The cause is latent; the fact remains. And yet, though the general arrangement of this business is expeditious, the particular details are not easy. Expense, labour, and inconvenience increase with the size of the picture in a compound ratio. A good apparatus is primarily necessary; then a lens of the best quality; then the calculation of the exposure is by no means simple; then comes the treatment of the plate, concerning which a series of articles contributed by M. Sahler to the *Bulletin de la Société Francaise* should be carefully studied; and then last, but not least, there is that little matter of the shutter. The shutter must be able to give an exposure brief, and variable; it must be simple to work, and of a material to withstand alike heat and cold, moisture and dryness; it must be so constructed as not to shake the camera; it may be large or small, or drop, or flat, or rotary, and every one of these forms has a list of arguments to show its superior advantage. Probably there is no photographic appliance over which more ingenuity and labour has been spent than the shutter. Shutters of curious variety have been manufactured and sold for blank pounds, and other shutters, said by their inventors to answer all the purposes legitimately required of a shutter, for as many pence. The fortunate individual who should receive a sovereign for every shutter that has been invented would be able, in the inelegant but forcible language of our time, to *go a buster*.

In spite of these spectres of the threshold, dear is instantaneous photography as remembered kisses after death to the amateur, for it is the amateur, and not the professional, who chiefly favours this branch of their common art. Your amateur takes pictures, more or less imperfect, of all the moving things on land, on sea, and in air. Breaking waves and rolling clouds are more to him than butcher's meat, or his Sunday excursion to Brighton, or his bank holiday at Wormwood Scrubbs. Occasionally he attempts other things than these: a diving duck and a lazy steam-launch he has considered worthy of his skill; but he commonly leaves the lightning flash, the racing yacht, and the London streets, boxers, cricketers, and tennis players, pigeons, storks, swans, and swallows, and many other varieties of moving life, to more experienced and professional hands, and, in favour of these, he resigns a hardy attempt to amuse and instruct his generation by means of the pheuakistoscope, which, being interpreted, means, as we are informed by the learned, an instrument of optical deception.

Most economical of all photographic processes in the matter of light—the fountain of all their energies—is instantaneous photography. Possibly it is for this reason that it is especially grateful to the sun artist. Whether his light be natural or artificial, he uses the least quantity of it to effect his purpose. The modicum which is next to none at all is sufficient for him. But, like an epicure at a feast, though he wants not much, what he has must be of the best quality. He desires it not long, but he desires it strong. Only when there is none at all procurable will he cry with the world in general, and the poet Martial in particular, whose praise of the life of the aged Antonius Primus, in the tenth book of his Epigrams, has furnished its motto to the PHOTOGRAPHIC NEWS, "*Nulla recordanti lux est ingrata.*"

THE CHICAGO INTERNATIONAL EXHIBITION OF 1892.*

BY JAMES DREDGE.

THE suggestion that a great International Exhibition should be held in the United States two years hence appears to date from the summer of 1889, when the rumour spread that Americans, incited by the brilliant results achieved in Paris, determined that a similar celebration, but one that should surpass in extent and grandeur the Centennial Exhibition of the French Republic, should be held on the other side of the Atlantic. The year 1892 was selected because it will be the four hundredth anniversary of the modern discovery of the New World, or rather, of some of its detached outposts lying to the south-east of Florida. It was on August 3rd, 1492, that Christopher Columbus sailed from Andalusia; on October 12th following he took possession, in the name of Spain, of the Bahama Isles, and two weeks later of Cuba. It was not, however, until nearly six years later, and in the course of his third voyage, that he discovered the American Continent; and in this discovery he had been anticipated by Sebastian Cabot, who had been sent out on an exploring expedition by Henry VII. of England, and who was the first to set foot on the American mainland; this was on June 24th, 1497. The choice of dates was therefore at the option of the organisers of the new scheme, and probably for some reasons it would have been preferable to have delayed the celebration until 1897 or 1898; that, however, would have been to dismiss the undertaking to a rather remote and uncertain future, and it was decided, therefore, that it was the first discovery of Columbus which must be celebrated, and that 1892 should be the year during which the commemoration should be held.

What was only a vague rumour floating over the Champs de Mars last year speedily took serious shape, and it became evident that, on or about the date first spoken of, an International Exhibition would be held in America. There can be no doubt that such a scheme is an eminently practical and useful one. Sixteen or seventeen years will have passed since the great Centennial Exhibition had been held in America; and this long period has been marked by a development of resources, a growth of population, an increase in industry and in riches to which history can offer no parallel.

The President of the United States has not yet issued the invitations of participation to foreign countries, because the financial conditions prescribed by the Act of Congress have only been very recently complied with; but it is expected that they will be delivered within a few weeks.

As regards the Art Section of the Exhibition, two dis-

* A portion of a paper read last week before the Society of Arts.

tinct questions would arise: the first having reference to an art collection worthy of this country, and consisting chiefly of pictures lent for the occasion. Such a course was followed at the Philadelphia Exhibition of 1876 with very satisfactory results; it is obvious that this class of collective exhibit has no reference whatever to commerce, and can only be carried out at a very heavy cost, which may be justified by the desirability of maintaining the credit of British art abroad. The other class of art exhibits has a more commercial object; there are many painters of excellence in this country who find it difficult to obtain and keep so large a number of clients as they desire, and these would undoubtedly find new purchasers in America in spite of the heavy tariffs imposed on paintings. Such an exhibit certainly may not be a representative one, but it would doubtless have the advantage of bringing to many struggling artists in this country a rich and liberal *clientèle*.

THE MAGIC LANTERN IN HOSPITALS.

The following is culled from the *Magic Lantern Journal*:—"We are about to suggest a new method whereby many of those who are, from various causes, cut off to a certain extent for a time from the outer world, may have their burdens lightened. We refer to convalescent patients in hospitals. The intended plan is to give the patients an occasional pleasant evening in the form of a lantern entertainment. Imagine the pleasure with which a person will welcome this exhibition who may have, for a long time, been laid up on a bed of sickness owing to disease or accident, to which all are liable. It is proposed that two or three complete lantern outfits be obtained, exclusively for the use of metropolitan hospitals, in which exhibitions could be given at frequent intervals. We feel assured that there is sufficient liberality and kindly feeling among manufacturers to contribute apparatus for this purpose, which could be placed in the hands of trustees; and we feel equally assured that among the large body of lantern exhibitors many would be only too glad to devote an evening, and conduct an occasional exhibition. It would also be a chance for young exhibitors acquiring experience in the conducting of exhibitions before larger and, perhaps, more critical audiences. A considerable number of slides would be required in order to give diversity to these entertainments; but after once started, we have no doubt that many of our readers would be very pleased to devote two or three slides for such a praiseworthy object. The selection, of course, would be left to the donors, but some suited for the amusement of children should be included." The editor asks for expression of opinion from his readers, so as to be able to announce in his next issue that action has been taken in the matter. The offices of *The Magic Lantern Journal* are at Dorset Works, Salisbury Square, London, E.C.

Action of Borax in Alkaline Developing Baths.—P. Mercier.—Sodium borate is generally considered as retarding the development, yet, as it presents an alkaline reaction, it ought to act solely as an accelerator. The explanation of this apparent anomaly may be found in a research by M. Ang. Lambert, published in the *Comptes Rendus*, and on the action of borax upon the polyatomic alcohols and phenols, and especially upon pyrogallol, hydroquinone, and pyrocatechin. It appears that boric acid combines with the primary polyatomic alcohols and certain polyatomic phenols to give rise to certain boro-conjugated acids. Thus, borax added in small quantities to pyrogallol converts it into a true acid which reddens litmus. It is the same with tannin and pyrocatechin, so that with these substances the addition of an alkaline borate is equivalent to the addition of an acid, the salt in this case causing retardation. But this reaction is not produced with the isomers of pyrocatechin, *i.e.*, hydroquinone and resorcine. Neither is it produced with the ether developing agents now in use. Here borax does not give rise to any acid, and acts merely by its alkaliuity.

PHOTOGRAPHY IN AUSTRIA.

Nomenclature in Photo-Mechanical Printing Processes—Schools of Photography—Orthochromatic Photography.

If one undertakes to write for an English technical journal one must, first of all, keep in mind the difference in the technical terms, for your countrymen often, with the same word, designate things quite different from that which we mean. For example, in all Germany half-tone zinc-etching is called autotype ("autotypie"). This expression was chosen by Meisenbach, discoverer of the reversible liniature, and the term still passes current here, just as the term "autotype" is used in England for the carbon process of pigment printing. The use of the Latin and Greek languages for forming new technical terms has the advantage that these expressions, being internationally intelligible, are more readily adopted than newly formed words in any modern language.

Recently an attempt was made to introduce purely German terms for all photo-mechanical printing processes. The credit of this attempt belongs to Mr. Dietrich Schultz-Hencke, first assistant at the Royal Polytechnic at Charlottenburg, Berlin.

Last spring, at the time of the Easter mass, there was a pretty exhibition at Leipzig. All those firms that occupy themselves with photo-mechanical printing, and who have an interest in bringing their productions to the notice of publishers, took part in it. More and more the illustrating of books devolves on photo-mechanical processes. Often, however, booksellers have but little knowledge of the manner in which the illustrations are produced, and so this exhibition was intended not only to show the best work executed in Germany and Austria, but also to explain the processes, to call attention to the half-finished manufactures, and finally, in the catalogue to give an exact account of of the processes which, when finished, produce pictures which are the delight of the beholder.

Mr. Dietrich Schultz-Hencke edited the popular explanation of the different photo-mechanical printing processes, and gave the following clear summary of them all.

I. *Flachdruck.*—Printing from a plane surface: (*a*) from stone, photo-lithography: (*b*) from zinc, without true deep etching ("Chemigraphie"): (*c*) from glass, with the use of the hygroscopic properties of chrome gelatine, which process is commonly known in Germany as "Lichtdruck," whereas in France and England it is now called collotype; (*d*) from glass, by pouring the chrome gelatine direct on to the negative. This is an imperfect method long since given up.

II. *Hochdruck.*—Printing from an image in relief, by means of the book printing-press: (*a*) from a line drawing, zinc etching phototype, just as the expression typography is used for printing, so the word "typus" has been assigned to those methods which produce forms for book printing. This is called photogravure in France. (*b*) Half-tone zinc etching; printing forms produced by means of a net-work. This is called "Autotypic" in Germany.

III. *Tiefdruck.*—Printing from an image in intaglio: (*a*) "Heliographie," printing with greasy ink from a copper-plate which has been prepared from a pigment relief by means of galvanoplasties. This is suitable for line drawing. (*b*) Woodburytype or relief printing; (*c*) heliogravure, half-tone intaglio etching on a copper-plate, with the help of a gelatine relief, or so-called pigment print.

IV. *Farbendruck.*—Colour printing; can be produced either by collotype I. *c*, or phototype II. *b*.

The special advantage of the catalogne is its intelligibility for laymen—to use that word in its index sense: its disadvantage consists in an impossible attempt at inharmonions word-formations, *e.g.*, instead of heliogravnre, the author expects us for the future to say "Licht Aetzton tief Druck," which, to one of the Latin race, must seem like an expression borrowed from the Chinese.

I had intended to write to you about Vienna, but have been so occupied with the Leipzig exhibition. Vienna has only three great photographic societies: the Photographic Society of Vienna (the oldest and largest of them), the Club of Amateur Photographers in Vienna, and the Union of Assistants, which last is unable to conceive of photographic training without beer. These societies have at their side *Die Photographische Rundschau*, *Die Photographische Correspondenz*, and two monthly organs, Moll's *Notizen*, and Lechner's *Mittheilungen*. These last two are published by business men, who have found out that any printed matter published under the name of a newspaper may be sent at the cheap book-post rate.

There are, farther, three great government institutions at work ennobling photography, and spreading a knowledge of it. Those institutions are the Court and State Printing Office, under the management of Colonel Ottomar Volkmer, an authority in electrotechnics: the Teaching and Experimenting Institute of Photography, under the direction of the learned Dr. J. M. Eder; and the Military Geographical Institute, which, in its photographic department, possesses several coryphenses, of whom Mr. Emmanuel Mariot, Baron Hubl, Mr. Rudolph Maschek—director of heliogravure—and Mr. Francis Fiek long ago won for themselves a name in literature.

For to-day I will confine myself to calling your attention to an excellent article by the above-mentioned Baron Hubl in vol. ix. of the *Mittheilungen* of the Institute, containing an account of all the photo mechanical printing processes, and especially of the orthochromatic process. This excellent chemist arrives at the same conclusion as that so clearly proved by Captain Abney, namely, that the expression "optic sensitisers" is an altogether unsuitable one. Dr. Eugen Albert, of Munich, has made a hole in the absorption theory by using yellow ammonia salts of picric acid in collodion emulsion, which, it is true, absorb the blue rays, but do not thereby sensitise the plate for blue, but, on the other hand, almost annul the blue action. At least, to a man's common sense, it is thus made clear that the sensitising for single colours does not depend on the absorption of the ray of light by the colours added, but that the colour must be so decomposed as to act chemically on the silver bromide. This fact is very bad for the adherents of the opposite view; but, clever as they are, they have found a way out of the trap, and assert that the colouring materials act sensitisingly with certain coloured rays only if used homœopathically, and, at the same time, mixed with the emulsion; if put on the plate in greater concentration they act as a screen. The fact therefore appears to be that optic sensitisers, as soon as they act optically, are no sensitisers, but the very opposite. Styx.

Camera Club Notices.—Monday, Dec. 15th, dark room closed from this date, dismantling for removal; Thursday, Dec. 18th, 5.45 p.m., general meeting to consider alteration of rules. No meetings will be arranged for between Dec. 18th and Jan. 8th. No smoking concert on Jan. 5th.

PHOTOGRAPHY IN FRANCE.

BY LEON VIDAL.

Meeting of the Permanent Commission of the International Congress—French Photographic Society: Installation of M. Janssen in the Presidential Chair—Damoizeau's Panoramic Apparatus—Photographic Cravat—Development with Hydrokinone by M. Balagny—Pusset's Hand Apparatus with Rapid Change—Cutting Board for Glasses—Re-opening Meeting of the Photographic Club of Lyons.

The permanent committee of the International Congress of Photography, which includes Messrs. de Bloehouse (Belgium), the Prince de Molfetta (Italy), Gylden, Sweden (hon. president), Janssen (president), Davanne, Marey, Wolf (French vice-presidents), Drs. Vylder (Belgium), and Petterson. Denmark (foreign vice-presidents), Pector (general secretary), Leon Vidal, Londe (French secretaries), Wada (Japan), and Skinsievitch (foreign secretaries), Gen. Sebert, A. Martin Cornu, de Villechole, Bordet, Perrot de Chamenx, Warnerke, and Fabre (members), held a meeting on the 5th December, 1890. At this meeting there were present, amongst others, Messrs. de Bloehouse, Warnerke, and Wada, foreigners. The object of the meeting was to arrange for placing in the hands of the Belgians the works resulting from the labours of the Paris Congress, for the purpose of the new international congress which is to be held at Brussels in August, 1891. It is to be hoped that many persons authorised to represent England, Germany, Austria, Russia, and other countries will then be present.

I have never thought that the decisions of the first Congress could be taken as without appeal, and I have reason to think that at Brussels there will be a revision of the decisions that up to the present are provisional. We must not hide from ourselves that there are points on which accord will be difficult: nevertheless, some greater progress will be made in the direction of a more important and far-reaching community of understanding.

At the meeting of the French Photographic Society held on the 5th inst., M. Janssen, the elected president, inaugurated his occupation of the presidential chair with a speech as eloquent as witty, in which he broadly traced the work already accomplished by, and the future of photography. He passed in rapid review the services rendered by it to science and art. To science, it constitutes an admirable means of control, of observation, and of registration. To art, it plays not only a documentary part, but produces really artistic work, worthy of forming a new class amongst those the assemblage of which constitutes what are known as the fine arts.

The discourse, which was much applauded, leads us to hope for the active assistance of the worthy M. Janssen to the French Photographic Society. Messrs. Warnerke and de Bloehouse have been invited to accept places in the bureau.

An interesting communication has been made by M. Damoizeau relating to a panoramic apparatus, capable of including upon a single pellicular film, by a combined movement, the whole circle of the horizon. The motor is a clockwork movement acting on the end of the camera and the pellicle cylinder in such a manner that these two movements are synchronous. The pellicle may have a

length of from five to ten metres, but the apparatus may be used either for the entire range of the horizon, or for any desired fraction of it. The band is perforated by a set of teeth actuated by an outside handle, to show how far it has been exposed, and a register shows how much of the pellicle is left upon the cylinder for future use. This apparatus supplies a perfect solution of the problem of panoramic photography. The bulk is inconsiderable, and panoramic views are obtained by it of three metres by fifty centimetres. Remarkable specimens have been shown by M. Damoizeau on "cristallos" pellicular bands.

The apparatus may be reduced to very small dimensions for views of nine centimetres in height. We think that science and art will derive an advantage from an apparatus so ingeniously combined. Let us add that the rolls of pellicular band may be changed in the open light, thus adding to the practical utility of the apparatus. The movement is capable of working at varying speeds, allowing us to give longer or shorter exposures, according to the sensitiveness of the film and the intensity of the light.

A photographic curiosity has been presented by M. Block under the title of photo-cravat. This apparatus is rather a toy than an instrument of importance, but it is ingenious, and proves that something else may be done besides the photo-gibus (hat) and the photo-waistcoat. Soon we shall have all the parts of the costume utilised, and for the ladies there will be photo-brooches, photo-bracelets, &c., and for men there will be photo-canes (or umbrellas), photo-portfolios, &c., not forgetting the old photo-opera-glass. But to return to the photo-cravat. The lens is fitted in a pin having the form of a horse-shoe; the focus is two centimetres; the shutter is worked by a pneumatic ball hidden in one of the trouser pockets; a button serving to change the plate passes through one of the button holes of the waistcoat; and now we may work the apparatus at a distance of one or two metres, provided that we have not a beard, which would mask the lens, and that we have not too prominent a chest, so as to point the camera towards the celestial regions.

M. Balagny, who is for France the hydrokinone made man, for it is he who has, so to say, introduced it there, although it was known elsewhere—notably in England—for a long time before, thinks the moment opportune for returning to the question, now that ideas are clearly formed as to the action of this developer. He recognises that the means of having a developer which does not become darkened in colour is to employ the caustic alkalies, ammonia, soda, and potash, in place of using alkaline salts, such as the carbonates of ammonia, soda, or potash. He prepares his baths with two solutions, one containing hydrokinone, sulphite of soda, and water, and the other containing caustic potash. He adds to the developer bromide of ammonium and also yellow prussiate of potash. If, says he, two baths are prepared, one with carbonate of potash and the other with caustic potash, the first will be seen to redden, and afterwards turn black, whilst the second will remain perfectly uncoloured. One quantity of solution serves to develop many negatives in succession, all endowed with great softness. He showed about forty, of 24 by 36 centimetres, on pellicular films that were very remarkable. The ideas put forth by M. Balagny are in agreement with those expressed by Mr. Reel, and to be found in a little work just published by the house of Ganthier-Villar and Son.

Again new hand apparatus, this time by M. Pusset, very ingenious, and in which the change of plates is effected with incredible rapidity.

It is at the present time with hand-cameras as it was recently with exposure shutters—each day brings forth a new pattern.

We have a multiplication of apparatus intended to realize the first solutions proposed by the International Congress. Messrs. Gilles Brothers have just presented a cutting-board for reducing, for instance, a plate of 13 by 18 centimetres to 12 by 18, the size adopted by the Congress. Of a truth the method is not new, and we have for a long time past known similar cutting-boards made by Mr. A. Cowan.

The Photographic Club of the South East at Lyons had an important re-opening meeting on the 15th of last month. A great Conference was organised, at which more than 500 persons assisted. The member of the Conference whose name heads this article selected as a theme "Photography and Colours." Projections in stereoscopic relief were shown; then a demonstration was given of the diazotype process, accompanied by a description. A superb banquet was offered to the writer. It is gratifying to see photographic emulation excited to so high a pitch in the most important, after Paris, of the French cities.

THE SOLAR CLUB.

Last Monday a dinner of the Solar Club, to celebrate its twenty-fifth anniversary, took place at the Café Royal, Regent Street, London, under the presidency of Mr James Glaisher.

The members of this luminous club call each other "rays." Ray Mill, vice-chairman, responded to the toast of "Success to the Solar Club," by saying that Rejlander, who was his predecessor in the "seat of Vice," used to be the great man of the Club; he was the Landseer of photography. The toast of "The Old Members of the Club" was coupled with the names of Messrs. Francis Bedford, Frank Howard, William Eugland, H. P. Robinson, Valentine Blanchard, and John Spiller, several of whom responded. Then, in impressive silence, "The Memory of Departed Members" was received by those present, all standing up; the names of those given were J. H. Dallmeyer, Samuel Fry, Jabez Hughes, O. J. Rejlander, and G. Wharton Simpson. Next the toast of "The Press" was responded to by Messrs. Harrison, Hastings, and Pearce.

The toast of "The Guests" was responded to by Mr. Barr, Major J. F. Nott, and Mr. Frank Howard. Mr. Barr complained of the gorgeous costume, in the shape of evening dress, he had been compelled, as he thought, to put on, to attend that dinner. He knew that English shirt studs were of no use, so had bought two before he left New York. One of them had a kind of spiral, which first had to be screwed into the bosom of the shirt, and then with a pricking sensation screwed itself into the bosom of the wearer thereof; he could compare that stud to nothing but conscience, and he had a bad one. The other stud was in two pieces, one of which had to be inserted in the linen from the front, and the other from behind. They would have known something of his sufferings had they seen him and a gentleman in the same compartment of a Metropolitan Railway carriage searching about the floor of that carriage with lighted vestas to find the two halves of the stud. When found, the problem was to restore them to their proper position in the shirt; the part that had to go into the front was right enough, but as to the part which had to go in from behind, when in a train which pulled up at a platform every two minutes—there came the difficulty. At each stopping place a little knot of observers began to gather on the platform opposite their window. He did not think that the Solar Club did its duty; for the last two months he had not seen the sun, and the club ought really to buckle to its duties, and attend more industriously to the working of the solar system.

After an impressive speech from Mr. Tom Archer, the Chairman said that he would not follow the subject of shirt studs, and that when he was in New York he truly got plenty of sunlight, but when he looked at the photographs in the windows he saw that the strong light often caused plenty of loss of half-tone not usually seen in English photographs, and in that city there was a bitterness of cold in the winter not experienced here. Their "chancellor for the dinners" had given them some sunlight that evening; he would propose his health. To this Ray William England responded.

Ray John Proctor had heard the proverbial remark about the heads of Scotchmen and the surgical operation; it was

not generally known that it was not the business of Scotchmen to laugh at bad English jokes, but to make good ones for the world at large. He then fired off several humorous Scotch anecdotes.

Mr. Glaisher then had to leave, and Mr. William Clark took the chair. Songs, music, and recitations of good quality at the beginning, and better quality as time wore on, then

enlivened the company; those who took part in this form of entertainment were Messrs. Wilson, Proctor, Blanchard, Pearce, Fitzgerald, Protheroe, Cadett, and Seamell.

The above cuts represent two Solar Rays as they appeared last Monday night. One of them is a speaker of great dramatic power, the other a brilliant foreign *savant*, admired and beloved by all who know him.

THE PHOTOGRAPHIC CLUB.—Subject for discussion on December 17th, "Photographic Plaything"; 24th, no meeting; 31st, lantern night.

CHLOROPHYLL AND LEAF GREEN.*

BY W. N. HARTLEY.

THE author refers to the numerous memoirs on chlorophyll of Stokes, Sorby, Chautard, Timiriaseff, Pringsheim, Reinke, and of Russell and Lapraik and Schunck. Having been occupied at various times during the last seven years in an investigation of the different colouring matters described under the name of chlorophyll, he has deemed it advisable to present his results to the Society without awaiting the further development of the research. The subject matter may be conveniently arranged under the following heads:—

a. Observations on the spectrum of chlorophyll contained in living tissues.

b. The spectrum of chlorophyll as seen in dried leaves.

c. Mode of extracting leaf-green unchanged, and separating the blue from the yellow chlorophyll.

d. Measurements of the spectra of the chlorophylls.

1. Living tissues which are fresh and young, and which, therefore, contain the leaf-green unaltered, exhibit no trace of a band in the yellow close to D, such as is usually attributed to chlorophyll, and there is no indication of one in the green. Complete absorption, just beyond *b*, extends through the ultra-violet.

2. *Yellow chlorophyll* has a distinct absorption band in the red differing from that of *blue chlorophyll*. It has likewise a distinct fluorescence.

3. When light is concentrated on living tissues, the absorption spectrum of the green colouring matter is soon altered.

4. Separation of *blue* from *yellow chlorophyll*. The *blue chlorophyll* may be extracted from minced leaves by cold absolute alcohol, and may be precipitated by addition of baryta. The *yellow chlorophyll* is not so precipitated, or not precipitated so readily.

A warm solution of boracic acid in glycerine, mixed with a little alcohol, liberates the unchanged blue chlorophyll from the dried barium compound.

5. The *blue chlorophyll* exhibits two absorption bands in the red, close together; in the less refrangible region of rays one overlies B and the other overlies C. There is a feebler band near D.

6. Concentrated solutions of *yellow chlorophyll* in benzene are brownish in colour, and exhibit a magnificent red fluorescence.

When *blue* and *yellow chlorophyll* are separately treated with formic acid and ether, there are produced two new substances showing absorption bands in the green. It is believed that when these bands have been observed, either in preparations of chlorophyll or in living tissues, that the chlorophyll has been altered by oxidation of formic aldehyde in the plant. The oxidation could be caused in living tissues by an excessive degree of illumination, which causes the destruction of the tissues, and otherwise by exposure of the contents of the plant cells to air or oxygen. An excessive illumination causes an exceedingly great activity in decomposing carbonic acid, and probably oxygen cannot be respired sufficiently rapidly; hence there may be a reverse action, or an oxidation of formic aldehyde to formic acid.

The leading characteristics of unaltered leaf-green are those of *blue chlorophyll*, namely, an intense absorption in the red, stronger even than in the violet or ultra-violet.

* The *Chemical News* abstract of a paper read before the Chemical Society.

FIGURES IN LANDSCAPE.

BY J. GALE.

How often we see photographs of charming scenery marred and spoiled—in some few cases by the introduction of figures at all; in others, by figures of inappropriate character; in others, again, by figures occupying ridiculous and impossible positions.

In the old days of slow plates, when the making of a negative involved a considerable amount of care and pains and trouble, particularly with the most rapid of the processes then worked (I mean wet collodion), photographers thought twice before introducing figures into their landscapes, and running the risk of the plate being spoiled by their movement, possibly by their walking altogether out of the picture during the exposure.

I have had many opportunities of observing how uninterested the modern worker is in photographs taken in those times; it is not owing altogether to the fact that he will not admit that anything good can have been done by his predecessors, nor to the fact that they are printed in silver, and consequently have faded, and present a worn-out and seedy appearance, but largely to the circumstance that there are no figures, or, if they do appear, that they do not form a conspicuous feature in the landscape.

Now, there are some kinds of landscape, comparatively few, however, where figures have no right to be.

> "There is a pleasure in the pathless woods,
> There is a rapture on the lonely shore,
> There is society, where none intrudes,
> By the deep sea, and music in its roar;
> I love not man the less, but Nature more."

But even this implies the presence in the scene of the poet himself. How lucky the photographer would be if he could only catch him—Lord Tennyson, for instance, with his cloak and slouch hat! He would be quite worth 6d. an hour as the model.

Most landscapes which can be rendered by photography may be improved by the introduction of a figure or figures. There may be some subjects where it is open to question whether figures are admissible or not. For instance, in "the lonely shore," would the loneliness be the less intense by the appearance of a wrecker gathering up the flotsam and jetsam after the storm? The poet, in his endeavour to impress us with the intensity of stillness, introduces several distinct noises.

* * * * *

> "And all the air a solemn stillness holds,
> Save where the beetle wheels his droning flight,
> And drowsy tinklings lull the distant folds.
>
> "Save that, from yonder ivy-mantled tower,
> The moping owl does to the moon complain
> Of such as, wandering near her secret bower,
> Molest her ancient solitary reign."

Would the solitude of the wild common, all snow-and-hoar-frost-bound, be less intense by the presence of yon old hag gathering up her bit of firewood? Again, the poet has his "all but" in describing the desolateness of the deserted village:—

> "For all the bloomy flush of life is fled:
> All but yon widow'd solitary thing,
> That feebly bends beside the plashy spring;
> She, wretched matron—forced in age, for bread,
> To strip the brook with mantling cresses spread,
> To pick her wintry faggot from the thorn,
> To seek her nightly shed, and weep till morn,
> She only left . . . ."

The mountain stream, wild and impetuous, should not have the cockney companion of your travels sitting perched on a rock staring into the camera—an unpardonable blunder often perpetrated; but a fisherman, suitably apparelled, dropping his fly in the pool at the tail of the rapid, would probably not detract from the wildness of the scene. Nor would the Matterhorn lose in vastness, majesty, and impressiveness by a group of roped and axed climbers in the foreground, on the very edge of a yawning crevasse.

On the other hand, it is not open to question that there are places where it would be worse than a blunder not to have figures. What should we think, now, of a photograph of the Bank of England or London Bridge figureless, or occupied by one policeman with nobody about to "run in" but the photographer? These busy haunts must be represented as we daily see them, teeming with the stir and animation of countless crowds; and yet it is not so very long ago that the photographer had to get up at five o'clock in the morning to avoid the crowd and do his work unmolested. In rural scenes, also, surely the costume must be considered; and the faultless garb of Hyde Park and Rotten Row be omitted if possible.

If the photographer *is* to introduce figures, let him beware of placing them where nobody but a lunatic would stand—in the middle of a bog, or risking his neck poised on a rock. There can be no question that round about a cottage is the normal and natural place for figures; and when and where figures are usually to be met with, then and there we cannot be wrong in including them in our view, provided they are of the right type, and not got up in their best clothes for the occasion. The placing of them must be left to the individual taste and fancy of the operator, but let there be an apparent motive for the placing. A skilled grouper will allow them sometimes to drop down haphazard, and then arrest them so that their position shall contribute to the composition of his picture; but he will generally find it necessary to carry out his already-formed ideas, and carefully group them in his own way.

Some children—and, for all that, children of a larger growth too—cannot, and cannot be made to, sit or stand easily and naturally when it is expected of them. Give them a penny to go away and buy some lollipops in the village, for a figure with a look conscious of the presence of the camera will spoil the view. Be very careful as to allowing even one figure of the group to look at the camera. Nothing can, now-a-days, be considered to be *even in the direction of* a picture where a whole lot of figures are gaping into the lens. It is scarcely admissible to find such a state of things in a group *other* than human, and it is better to avoid it in one's studies of sheep, cattle, and other animals irrational.—*The Journal of the Camera Club.*

Improving Poor Negatives.—To improve a poor negative and modify extremes of light and shade, cover the whole of glass side of the negative with any ordinary negative varnish in a cold state. Scrape off as much of this coating opposite the densest parts as is necessary, and if there are any very thin spots in the negative, a little Prussian blue water-colour may be brushed over the varnish to still farther soften the printing through these parts. Of course this dodging has to be done with judgment, or the resulting print will be wanting in those very qualities of which it had an excess before. If the first experiment in this direction is not successful, the whole coating may be cleared off by methylated spirit, and done again.—*Scraps.*

Notes.

According to an American Journal, *The Picture and Art Trade*, the demand in the United States for high-class works of all kinds is steadily on the increase, and has been growing rapidly for some years past. It is said that the chief studios of France, Germany, Italy, and Spain are almost emptied. All the old work, particularly of the Barbizan school, which was in the hands of dealers or in the possession of collectors of small means, has been bought up, and the living painters whose canvases are in demand have orders for work beyond their power of turning it out for a long time to come. The demand is not confined to paintings; rare etchings and engravings are also sought after. As the Americans grow more wealthy the taste of many of them is turning in the direction of high art, which is a good sign, as first-class pictures have a refining influence.

The London Chamber of Commerce is now exerting itself in relation to the improvement of home and international copyright laws, in which subject four of its sections are interested, including the one devoted to photography. These four sections keep in communication with each other by means of two delegates appointed by each of them, making eight delegates in all. At present, the chief points of interest are the prohibitory enactments of the American Copyright Bill. In France, activity prevails about similar subjects. The Minister of Foreign Affairs, at the request of the Russian Government, has asked the Syndicate for the Protection of Literary and Artistic Property to furnish a precise enumeration of the facts relating to the illicit reproduction in Russia of French works of art of any kind, to the injury of the rightful owners, since the abolition in 1887 of the arrangement about literary and artistic property made between the two nations in 1861. The Syndicate has specially mentioned photographic piracies as one of the subjects about which it desires information from those who have suffered. The general secretary to the Syndicate is M. Germond de Lavigne.

Haze is a subject of interest to photographers, especially at this time of year, when fogs so much interfere with photographic work in the studio. Mr. Aitken has given the Royal Society of Edinburgh his experiences on this subject. The formation of haze depends much upon the condensing power of the dust in the air, so Mr. Aitken's plan was first to collect some of this dust from different situations upon glass plates, and afterwards to find at what temperature above the dew point the special kind of dust condensed the vapour of water in the air. He found that magnesia dust has small affinity for water vapour; that gunpowder smoke has great condensing power; that dust collected in a smoking room has greater power of condensing vapour than dust from the outer air. He came to the conclusion that there is no definite line of demarcation between hazy and clear air, and that the air is never entirely free from mist. Whenever the air is dry and hazy at the same time, it always contains a considerable amount of dust.

The first Friday evening lecture of the session at the Royal Institution will be delivered by Lord Rayleigh, on "Some Applications of Photography," and is sure to be of interest. Lord Rayleigh is well versed in photographic optics, the properties of lenses, and is a high authority on the subject of light. One curious fact which he discovered, and proved experimentally, is that, by the suitable admixture of the pure green and the pure red of the spectrum, a bright yellow colour can be produced. He has also sometimes charged water with certain salts until the colourless solution had the same effect upon light as glass, so that a glass rod became invisible throughout the length of it immersed in the liquid.

At the complimentary banquet which was given last week at the Hôtel Métropole to Mr. W. L. Thomas, the originator of the *Graphic*, to signalise the coming of age of that paper, there were gathered together nearly three hundred guests, among whom were many of our leading artists and literary men. The speeches were necessarily much about art, and, of course, photography came in for its share of recognition as an aid to those who wield pencil and brush. Prof. Herkomer, the chairman, in giving an interesting retrospect of his career, alluded to the time when he was so "hard up" that he found a difficulty in scraping together the sovereign which he paid for his first block of wood twenty-one years ago. At that time, he reminded his hearers, the artist had to draw direct on to the wood, and, in the process of engraving, his work as a drawing was necessarily destroyed. Now it is different; the artist draws on paper or cardboard, and the image of the drawing is photographed on to the wood block. The original thus remains intact, and retains a value which is measured by the status of the artist.

This power of preserving drawings intended for book or newspaper illustration is one of the boons which photography has conferred upon artists and publishers. The first can point out that after their drawing has been transferred to wood it will still remain a valuable property, and on that ground can command a better price for their work. The importance of the matter from the publishers' point of view may be estimated by the circumstance that every year Messrs. Cassell hold a "black-and-white" exhibition, consisting of works which have been executed by well-known artists for their various publications. These are offered for sale at a price varying from one to twenty or thirty guineas.

At the same banquet photography came in for recognition in another field of usefulness. Colonel Fitz George, in replying to the toast, "The Army and Navy and Auxiliary Forces," took occasion to pay a tribute of admiration to the courage shown by special

correspondents and artists, who have often followed the fortunes of a campaign and have shared its dangers. He prophesied that the war artist of the future would depend more upon the camera than the pencil, and ventured to parody Tennysou's poem by speaking of the troops as having "Kodaks to right of them, kodaks to left of them, &c." Another speaker thought that artists and photographers would be unnecessary in future warfare, because means would be found to telegraph the images of passing events direct to the editors at home. This last sentiment met with so much cheering that it was evident that there were not many practical photographers present among the guests.

We have had the opportunity of examining a few of the portrait negatives taken by flash-light by the apparatus designed by Messrs. Slingsby, and made by Marion and Co. These portraits show no trace of movement or uneasiness about the eyes, and indeed cannot be distinguished from ordinary daylight negatives. The secret of success seems to lie in using a quick shutter attached to the lens, in conjunction with a battery of flash lamps, in such a manner that the exposure is terminated before the flash is over. By this arrangement the sitter has not time to be startled, or surprised, or to signalise his feelings by a wink before the image has been secured and the lens shut up. It would seem that the magnesium flash is like that of lightning, far slower than it was supposed to be, and this device of the auxiliary shutter successfully copes with the difficulty.

M. Marey will shortly have very few worlds to conquer in regard to the photographing of the animal world in motion. He has already conquered the beasts of the field, the birds of the air, and he is now assailing the fishes of the deep. In other words, he has succeeded in photographing the movements of an animal under water, taking pictures at the rate of fifty in a second, with exposures of from $\frac{1}{2000}$ to $\frac{1}{3000}$ of a second. A set of twelve photographs gives all the phases of the undulations which the medusa impresses upon its umbrella of a locomotor apparatus. Another series exhibits a squid leaping out of the water. A ray has been taken in profile while waving the edges of its flat body; and the curious mode of progression of a cometula has been taken. We shall next hear of him photographing the rapid fluttering of the wing of a dragonfly.

Of late, the art of photographing from a balloon has advanced very much, and the results now obtained leave little to be desired so far as detail is concerned. *La Nature*, in its current number, reproduces an excellent plate of a view of Nice, taken at three hundred yards distance by M. A. Weddel in the captive balloon of M. Louis Goddard, at the commencement of the present year, in March, 1890. The apparatus is suspended from the neck with a strap, leaving the hands free; then, by a screw arrangement, the camera can be turned in any direction, and, when turned towards the subject to be secured, whether it be a neighbouring cloud or a town beneath the balloon, there is nothing left to be done but to use the shutter at the given moment.

The *Daily News* endorses the opinion expressed in these columns more than once, and repeated last week, that "many of our artists have not yet learned the technique which best suits processes." Our contemporary is of opinion that the reason why our foremost novelists do not have their books illustrated, as used to be the case in the days of Dickens, Thackeray, Lever, and Trollope, is to be found in the present methods of illustration. To replace engravings in copper, steel, and wood, we now have "processes"—photographic or otherwise—which too often produce the most hideous and undesirable results. By one method, all creation is made out to exist in various shades of "shepherd tartan" black and white checks. By another, pen drawings "come out" painfully scratchy. This, as we have before pointed out, is unfortunately true. There is certainly need for some artistic and unconventional genius to set a new fashion in drawing for photographic reproduction.

It is only natural that the *Undertaker*, the organ of Mr. Mould and his colleagues, should rush to the defence of the practice of placing photographs on gravestones. It joins issue with another journal which prints a paragraph to the effect that the method of having photographs over graves is not a new one. The paragraph goes on to say: "In Hungerford Churchyard there has been for eight or nine years a gravestone upon which is placed the photograph of the person interred beneath." On this the journal in question comments to this effect: "We think the less this idea spreads the better. There is a coarse realism about it which is, we think, not in good taste." We must confess we coincide with the *Undertaker*, that it is rather difficult to see where the coarseness comes in. The only exception we would take to the practice is where the photograph is of such a fleeting nature that, when faded and discoloured, it gives what an imaginative mind would conceive to be a very realistic resemblance of the person buried. As to the date when the practice first came in vogue, we fancy that it extends to a much earlier period than eight or nine years ago.

Printing in colours by a single operation is as much of a will-o'-the-wisp to the printing enthusiast as is photographing in natural colours to the photographic enthusiast. Processes are continually being discovered, only to be rapidly left alone. The latest invention is that by a young Wisconsin man, A. P. Hanson by name, who is now a resident of Copenhagen. He calls his invention a colourgraph. By it two or three or even more colours can be printed on the same paper at one impression. As yet it has not been adapted to printing.

ARTIST PHOTOGRAPHER—A CLAIM FOR LIBERTY.*

BY HENRY E. DAVIS.

If the artist is a man whose efforts are likely to be of any worthiness, if he really has any artistic perceptions of any value, he will know that dogmatism in art is absurd and an impertinence, and only to be broached by enthusiasts who have lost their heads over a fad to which they are so far committed that they are bound to *see it through*, however disastrous the end of such pretensions may be to themselves. But, unfortunately, they have disciples among those who mistake eccentricity for merit, and, having really no artistic perception whatever, think that, by following the beckoning of some "Sir Oracle" more or less misinformed, they can be manufactured into artists. The true art student quietly pursues his joyful path, while these pretenders to exclusive taste have all, more or less, the *cacoethes scribendi* and *loquendi*, and fill the societies' meetings and the journals with their twaddle, founded chiefly on the perusal of Ruskin and kindred authors, whose best points they miss in their desire to imitate, at a great distance, a style generally grandly eloquent, but frequently deficient in sound reasoning. I often wonder what John Ruskin would say in reply to a demonstration of the views of a naturalistic photographer. My impression is that he would recommend him to attend an elementary art school for a month as a preparation for studying his "Elements of Drawing."

What do the naturalistics require from the artist photographer? They apparently agree on one point, viz., that excessive hardness of detail is not conducive to artistic effect; here, with occasional exception, the painter will be generally with them, but they propose to obtain softness by putting the picture wholly or in part out of focus. This is the weak point of their claim for recognition. The fact is that, with all their study of art and art criticism, they have ignored what is generally the principal factor in the production of a picture—colour, and the media with which it is used—whereas the artist photographer is limited to monotint executed by a printing process. They have not perceived that much of what they see exhibited depends for the effect which they wish to secure, not on being painted with varying focus, which no true artist would do, but on the technical training of the artist ensuring the use of his vehicles in such manner that the heavier detail of his picture sinks in more or less, according to his style or the requirements of the occasion, and that he is able to strengthen or lower the effect of his picture in parts by retouches of colour or other mechanical means. This is a method of proceeding exceedingly difficult for the artist photographer. If retouching a photograph is once allowed, it is impossible to limit the extension of the practice, and such treatment carried to excess would eventually result in what would virtually be a painting.

Nevertheless, there are, to the accomplished photographer, many legitimate ways of dodging and modifying his results, which give him considerable latitude in the manipulation of his pictorial effects. Nor must the facility of improvement by the use of isochromatic plates and tinted screens be forgotten.

The naturalistics, having concluded that everything should for their purposes be more or less out of focus, a further discussion has arisen among their disciples as to what limitation is to be put to this out-of-focus system, and it is actually a subject of debate among them whether or not a circle of confusion of one-hundredth of an inch is the allowable limit or not. Shade of Appelles! Only imagine an intention to regulate artistic execution by minute mathematical calculation.

In fact, what the naturalistics want to do for us poor suffering photographers, is to establish a fixed style for the worker, in which only he is to exhibit the pictorial exposition of his artistic conceptions. But what should we say of an art critic who picked out the highly finished but occasionally somewhat hard style of Landseer, any one of the varying styles of Turner, the plucky impasto of Constable, the minute execution and delicacy of Meissonnier, or the fanciful imaging of a Whistler, and declared that that one he pointed out, and that one only of all these varying styles of execution, is "the only correct and genuine one, all others are counterfeit. N.B.—See the name on the frame"? Would such a teacher meet with encouragement elsewhere than in a farce? And yet the naturalistics have received attention from photographers.

The object of art is to secure admiration and sympathy; its factitious regulation by a narrow-minded clique is impossible. I claim freedom in his work for the artist photographer from these attempts on his liberty of style. If photography is to be used for pictorial purposes, the performer of the work should be left free to adopt his own method for his ultimate object. It would then be that after a time the more able of the artist photographers would gradually form styles each more or less individual, so that it would be possible for a visitor to a photographic exhibition to point to a good picture and say at once, "This is a Smith, or a Jones, or a Jenkins," as the case might be, in the same way that a visitor to the Royal Academy Exhibition can point out a Millais, a Leighton, or a Long. I wish it may in the future truly be said, "By their works ye shall know them."

There has been within the last two or three years a great advance in the manipulation of photography for art purposes, but if the producer of good work is to be trammelled by quack ordinances, then the result will be that, though much good work may continue to be done by lovers of art for its own sake, it will be seen only in the homes of the artists, and will not be sent for public exhibition until there is evidence that the naturalistic craze has ceased to influence the hanging and judging committees.

Art conception is the property of no set of men. The failure to have received any technical education may, in a multiplicity of cases, prevent its expression, but we find it permeating "all sorts and conditions of men." The hard-worked mathematician or banker may find relief in picking out beautiful subjects from the glorious scenes of nature, and feel himself refreshed and ennobled by the ideas which his selections may induce; nor are men of more humble standing, even the illiterate, debarred from the enjoyments of such imagination. Oftentime, wandering away from home, we meet with a humble labourer, to whom has been vouchsafed the capacity for the mental elimination of the special beauties of his loved country side. This man will show you the most lovely bits, the quaintest prospects, for miles round his lowly abode, and his enthusiasm for the beautiful, perhaps roughly expressed, will ensure the artist appreciating in him a brother who truly "Finds tongues in trees, books in the running brooks, sermons in stones, and good in everything."

* Continued from page 913.

Literary Notices.

LANTERN SLIDES BY PHOTOGRAPHIC METHODS. By Andrew Pringle, F.R.M.S. (*New York: The Scovill and Adams Co., 423, Broome Street.*)

THIS book is of special interest at the present season, when so many persons are engaged in lantern slide work. The principle upon which the author has acted, is to select a few of the best processes for making the slides, and to describe them minutely, for beginners in any process are frequently at a loss when working from instructions in books, in consequence of the authors having omitted to state useful little points of detail. At the present time, this is likely to be the case in relation to lantern slide making by any of the collodion processes, so many individuals having been born into the photographic world since the advent of gelatine dry plates. Another good point about the book is, that Mr. Pringle writes about those processes alone in which he has had personal practical experience, and photographers in this country know him to be a safe guide in such matters.

As to the artistic value of lantern slides, he expresses the following opinion:—

We see it asserted in a book professing to teach art to photographers that a lantern slide must be outside the domain of art. The writer of this book says nothing whatever in defence of this position of his: he bases it simply on his authority, which, to many minds, will not be enough to condemn slide making. As a matter of fact, an image projected on a screen through a slide may be just as good or as bad from an artistic point of view as a paper print. Practically, such an image is a print on paper, cloth, or in *fresco*; but it is large, and is not persistent. That the ordinary run of slide images are incorrect in "values," wanting gradation, false in "tonality"—whatever that may be—is possible; but that these defects are inherent in and inseparable from slides is a ridiculous and false assumption.

That Mr. Pringle is right in his contention seems to be proved by the circumstance that on rare occasions a lantern picture excites the feelings of the observers—for instance, the Camera Club journal once printed that a picture of the St. Gothard Tunnel had been so projected, and that it had a "weird" effect. Among the photographs brought home from Iceland recently by Dr. Reynolds, and printed as lantern slides, is one in which two men in a dark, shadowy region are seen entering the cloud of steam rising from a boiling spring in the mountains; it might well serve to pictorially represent one of Dante's descriptions of places in the infernal regions. The modern costume of the two individuals somewhat detracts from the romance of the scene, but that could be altered another time; moreover, no Act of Parliament has yet been passed exempting British-born subjects of the present time from entrance into those regions. If a collection were made of the exceedingly small minority of slides which excite the feelings of the observers, the minor points of technical detail might be discussed to see to what extent the lantern slides of the future can be made to meet artistic requirements. There are some weird scenes about the St. Gothard Tunnel, especially near its third and disused entrance near Airolo. The tunnel has three entrances; the third, now closed to traffic, was chiefly used during the construction of this great monument of human skill. The said disused entrance on a wet and wintry day, with the deserted and rotting houses once used by the workmen; the rank weeds springing here and there from the otherwise barren soil, and the dark rocks rising above, formed a few years ago a striking scene of desolation. Whether it presents that aspect now we know not, as the intention then was to utilise this entrance in the way of fortification. The Swiss have made abundant preparations for defending the tunnel, and blowing up the bridges near its entrances, in case of war. Mr. Pringle's antagonist, whoever he may be, is probably right in relation to the great majority of lantern slides.

The author gives the following as the characteristics necessary in a good slide:—

A slide, to be perfect, must have:—1. A high scale of lighting. 2. A continuous scale of gradation. 3. A pleasing tone. To put it otherwise, a slide must have:—1. Clear highest lights. 2. Secondary lights well furnished with detail. 3. Middle tones. 4. Transparent shadow details. 5. A good general colour of image.

As to merits of some processes of production, he says:—

The quality of *clearness in the highest lights* is certainly most easily obtained by the collodion processes; these are followed more or less closely in order by the gelatine-chloride process, the gelatine-bromide process standing last in this respect.

The quality of *opacity in juxtaposition with absolute clearness*, which is so valuable in such slides as are copies of engravings, is most easily obtained by collodion with or without intensification, by gelatine-chloride, and then by gelatine-bromide used in a special manner.

A long *scale of gradation* is a branch of excellence wherein gelatine-bromide stands first. The other processes we cannot place in any order of merit, except that we are inclined to place wet collodion last. The qualities of *half-tone* and *transparence of shadow* may be taken as synonymous or equivalent, and may follow the same order; but of all the transparent shadows we have ever seen produced by pure photography, none could match with those produced by Mr. A. L. Henderson's "argentic stain."

Warmth of tone may, to a certain extent, be achieved by any of our processes; but warmth combined with excellence in other respects is certainly the province of dry collodion. With gelatine organo-chloride plates we can with ease produce a very long range of colours, from scarlet to the coldest blue; but there is a something lacking in the other qualities of plates treated so as to give the warm tones.

The gelatino-bromide process for lantern slides has a long array of advocates in its favour among practical photographers who are experts in this class of work.

Another process mentioned by Mr. Pringle is not much in use, and from his description of it the method seems to deserve more attention than it has received; it was devised by Mr. A. L. Henderson, and we cannot better close our notice of Mr. Pringle's useful book than by quoting what he has to say about the "argentic stain" in relation to lantern-slide printing:

By a process published some years ago by Mr. A. L. Henderson, and used experimentally by the writer, results were obtained more decidedly fulfilling certain desiderata than any other process we have ever seen. The image seems really to consist of a stain rather than of a molecular precipitate of a metal; but, of course, it is a reduction and not a stain. The process is one of printing-out and subsequent toning, and we give it as a good example of processes which might be classed under that one head.

No. 1.

Soak, and then dissolve at low temperature—

Gelatine	240 grains
In—	
Water	10 ounces
Add—	
Sodium acetate	46 grains

No. 2.

Silver nitrate	170 grains
Water	10 ounces

No. 3.

Sodium citrate	30 grains
Sodium chloride...	20 grains
Water	1 ounces

Add No. 2 to No. 1 ; then add No. 3, all the solids being, of course, dissolved, and the temperature low. Lastly, add 2 ounces of dry, hard gelatine, see that all is dissolved, make up with water to 30 ounces, and coat the plates rather thickly. Dry in a drying press or closet in the usual way. Print deeply by contact in daylight ; the printing will be rather slow. Do not wash the plates after printing, but place them directly in the toning bath which is recommended by Mr. Henderson as follows :—

Gold chloride	2 grains
Sodium acetate	20 ,,
Sodium chloride...	20 ,,
Water	10 ounces

Neutralise the acidity with chalk, filter out the chalk, and then add 3 minims of acetic acid. The plate is treated with this solution till it takes a suitable tone ; it will go through various changes of colour during the operation, and the longer the action is allowed to continue, the colder will be the tone. The writer toned plates produced by this formula with the sulpho-cyanide bath, and got very good results.

Ammonium sulpho-cyanide	140 grains
Sodium phosphate	140 ,,
Sodium tungstate	100 ,,
Water	24 ounces

Dissolve, and allow to stand for a day or two ; then add—

Chloride of gold...	15 grains
Water	4 ounces

This bath is apt at first to act unevenly, especially if used too new. After toning by either of these methods and washing, fix the slides in weak hypo thus : sodium hyposulphite, 1 part ; water, 10 parts. Thereafter wash thoroughly, dry, and varnish with clear varnish. A strong point of this process is that combination printing of clouds, &c., is very easy.

THE PICTURES AT THE EDINBURGH PHOTOGRAPHIC EXHIBITION.—I.

THE great exhibition held in Edinburgh in 1876 was remarkable as standing out with distinctly the best collection of photographs, truly international in character, that had up to that time been brought together ; and, as representing the best work of the best workers in the world, has not been surpassed anywhere since. In some instances, the pictures then exhibited would hold their own in the present day, but on the whole it is impossible not to recognize the great advance in general excellence that marks the present exhibition. With but few exceptions the work shown is of a high order of merit, but unfortunately the strong point of the 1876 exhibition, its international character, is wanting in this. The display now on the walls of the Royal Scottish Academy is in reality a high-class exhibition of home productions in which local work is prominent, whereas the local work in 1876 was by no means so.

On first entering the noble suite of rooms, one is struck with surprise that photographs can clothe the walls with such a satisfying effect ; the eye is gratified by the well-filled appearance and general arrangement, and these first favourable impressions prepare the visitor to anticipate satisfaction while examining the details ; nor will he be disappointed.

Of course the large works first catch the eye, and among them will be found portrait studies so perfect in *technique*, so feelingly executed, so tender in tone, so full of character in pose, expression, treatment, that the spectator cannot fail to ask himself if the addition of colour could possibly improve them ; nay, it may so happen that some who will visit these rooms next February may regret that a few of the canvases could not be replaced by some of the charming monochromes now on view.

The major portion of the Exhibition consists of large pictures in pigment, platinum, and gelatino-bromide, while the small prints are nearly all in matt-silver, gelatino-chloride, or albumen—principally the latter ; nor is this to be wondered at.

There are probably more people with half-plate cameras than any other size—except, perhaps, the toys—and as those who use them are in most diverse situations, and the negatives produced vary so greatly in quality, it is natural to expect each operator will employ a printing process that will give the best average results with the least amount of trouble. Albumenised paper is easily obtainable and is most generally understood, while, if judiciously used, it will make passable prints from almost any kind of negative. Besides, small pictures are examined closely, and the highly-glazed surface lends itself particularly to the rendering of minute detail, not only in the high-lights and delicate half-tones, but also in the shadows, which latter are rich and transparent. While making these remarks, I bear in mind that one of the most exquisite landscapes I ever saw at an exhibition was also one of the smallest, and was printed in platinum. The picture referred to was by Berkeley, at the Dundee Exhibition some years ago, and, as far as can be remembered, received no recognition by the judges. Doubtless the negative was peculiarly suitable for platinum printing, and would also have produced charming results in any other process ; but there is no doubt that many negatives will produce more satisfactory prints on albumenised paper than on anything else.

On page 899 will be found the various classes under which exhibitors were invited to compete, and in each of the twenty-two classes one silver and one bronze medal are offered.

CLASS 1. *Landscape, 8½ by 6½ inches or under.*—(As there are about 220 pictures entered in this class, it is impossible to criticise them individually ; we propose only to single out those which appear the most prominent.)

Charles Digby Jones exhibits a number of 5 by 4 prints in platinum, representing Continental views from negatives that must be of exceptionally fine quality. His work is alike admirable in composition and general treatment. In No. 615 the dark pine trees and snow fields are beautifully rendered, while the five views in No. 654 are exceedingly picturesque, the central one being specially so ; in this the sky and interesting middle-distance and foreground are exquisitely rendered and it is well balanced in all its parts.

R. Keene, No. 681. Six whole-plate platinotypes, illustrating "Derbyshire Dales." These also are exceptionally beautiful, the perspective most effectively rendered. They are charming in composition, and have a sufficiency of light and shade, without the meaningless masses of heavy, opaque shadows occasionally seen. A fine artistic scene, with the controlling hand of a master in technique, all combine to produce results that are eminently satisfying.

Ralph W. Robinson sends a number of his well-known pictures. They are generally simple landscapes in which one or more figures are introduced. They are all characterised by a feeling of naturalness, without any appearance of straining after effect, or the posing of the model. "A

Little Truant" is an instantaneous view of a quiet stream on which are floating a number of ducks, while on the bank stands the "truant," all happily caught at the right moment. "Frozen Out"—a pretty rendering of a simple subject, in which a peasant woman is seen breaking the ice with an axe in order to procure water.

W. Stewart, L.R.C.P., No. 726. Five half-plate alpine views (printed on gelatino-chloride paper) of great beauty, that of the "Dent du Midi" being particularly fine. In this, from the snow-field in the immediate foreground, the crevasse in the middle-distance, to the cloud-enwreathed distant mountain, all is depicted in the most tenderly delicate manner, while the quiet sky is in most admirable keeping. Very beautiful also, are the other four pictures in this frame.

W. Mansfield, No. 241. Four street views in platinum, noticeable for the fine rendering of the elm trees. His views of St. Mary Cray are soft, yet brilliant in lighting; one, a quaint old church seen in an arborescent framing, has the character of the trees well portrayed.

G. G. Mitchell, No. 148. Thirteen landscapes; these are successful attempts to combine figure and landscape, some being exceedingly picturesque.

C. P. Cameron, No. 504. Two whole-plate views, one representing an avenue of trees in which the perspective is finely indicated, the other a very effective picture in which a fine-foliaged tree occupies two-thirds of the subject, while through its bending boughs appears a beautiful peep of sun-lit landscape—a distant hill with a village and its church.

J. Patrick and Son, 127, "Bits by the Way." Thirteen interesting rural scenes—a placid pool with water-lilies, a country lane with children, storm-worn cliffs, and rock-encumbered stream.

R. S. Webster, "Astonished." This represents some cows reposing in a meadow at the head of a lovely valley. The animals apparently have just discovered that they are being photographically interviewed. "The Avenue" (692): a pretty effect of light breaking through the trees, and a charming rendering of detail.

A. S. Watson, 142. Three evening studies taken facing the sun: effective cloud and water.

R. H. Pearman, 91. Pleasing woodland views, and a charming rendering of hoar-frost in a country lane (404).

J. Pettigrew. Eighteen 5 by 4 pictures on aristotype paper, very varied in interest and subject, one or two somewhat under-exposed: the others are particularly bright and effective.

Sydney Keith. Views in the Tyrol, Innsbruck, Wales. These are crisp and brilliant photographs, in one or two of which the foliage appears somewhat heavy. This remark by no means applies to No. 160, which is harmonious.

James Crighton, No. 173. Nine views of quiet rural, prettily chosen bits, nicely treated and tastefully mounted.

H. Little, No. 7. Eight seascapes with rugged rock and surf-beat shore.

S. N. Bhedwar, No. 777. "Washing Day," a pretty little picture, representing two children at play, and naturally illustrating the title.

Miss G. J. Waterson, "Pine Woods," No. 1,038. A very successful rendering of the subject with characteristic effect.

W. Kenworthy, "Evening in the Mediterranean," No. 848. This whole-plate platinum print represents an expanse of quiet, reposeful sea, with setting sun and beautiful cloudscape.

P. Ewing, No. 999. Nine whole-plate views. These are distinctly meritorious, from which may be singled out "A View on the Devon," "Loch Achray," and "A Pass in the Trossachs," as worthy of special notice.

Karl Gregor exhibits six pleasing rural views—wooded landscapes and running streams, with cattle and sheep successfully introduced.

J. P. Gibson shows particularly good work on matt silver paper. No. 226, "A Queen among the Roses," is a pleasing composition; so also is "The Ford."

A number of platinum prints is also exhibited by Marshall Wane; they are good average work, and the same may be said of the pictures about Gosford by Jamieson and Co., the pictures by Alexander Nicol, and the Rev. R. H. Blake. Of the pictures by Charles Reid, "Bothwell Castle" seems the most satisfactory: it has a capital rendering of foliage.

The majority of exhibits in this class appear to have been taken in the half-plate camera, and, as indicated above, are mostly printed in silver; a few—principally 8½ by 6½—are in platinum. X. Y. Z.

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

THE following are the minutes of a meeting held at the Grand Hotel, Manchester, on Thursday, November 27th, 1890, with Mr. R. Slingsby, of Lincoln, in the chair.

Present.—A. Lafosse, Manchester; Warwick Brookes, Manchester; E. A. Myers, Manchester; G. Higginson, Bowdon; S. Birtles, Warrington; R. P. Gregson, Blackburn; S. Storey Davis, Halifax; R. Jennings, Blackburn; Donald MacIver, Leeds; H. Graham Glen, Leeds; H. J. Whitlock, Birmingham; John E. Shaw, Huddersfield; D. Bordley, Stafford; F. H. Waley, Doncaster; W. H. Marks, Prestwich; John Grnsby, Pendleton; C. Pettingall, Liverpool; Hubert Henry, Haslingden; F. Sharples, Blackburn; Percy Knott, Bolton; H. J. Godbold, St. Leonards; William Gill, Colchester; J. E. Eddison, Barnsley; Frank M. Sutcliffe, Whitby; W. Roxby, Leeds; Robert Broadhead, Leeds; E. Greaves, Halifax; Brooke Brookes, Bradford; J. H. Amley, Sheffield; Jamson Bros., Liverpool; A. Seaman, Chesterfield; J. W. Tattersall, Accrington; Jeffery Dimsdale, Dewsbury; Thomas Heap, Sowerby Bridge; R. Whitehouse, Manchester; J. H. Crosby, Rotherham; D. Battersby, Manchester; and Chas. P. Richards, Barrow-in-Furness, hon. secretary.

Telegrams from Messrs. Elliott (Elliott and Fry), London; Eason, Dalston, London; Sirdle Brothers, Swansea; McLardy, Oswestry; Fall, Baker Street, London; Ramsay, Bridge of Allan; Dickerson, Sheffield; Bara, Ayr; and letters from Messrs. Chevalier, Tunbridge Wells; McLean, Hunstanton; Phillips, Biggleswade; Burrow, Camborne; Lang Sims, London; Smart, Stirling; Hicks, Glasgow; Midwinter, Bristol; Forrest, Pontypridd; Pratt, Greenock; Ford, Lincoln; Dew, Coventry; Weston, London; Marshall, London; Moffatt, Edinburgh; McKean, Leith; Fieldwicke, Brighton; Hogg, Kendal; Evans, Swansea; Hart, Ashbourne; Tomlinson, Rochdale; Hoggard, Redcar; Bliss, Grantham; Child, Leeds; Faulkner, Woolwich; Brightwell, Wellingboro'; Middleton, South Shields; Becket, Saltcoats; Broadhead, Leicester; Walmsley, Liverpool; Hubert, Hackney; J. P. Clarke, Bury St. Edmunds; Pinder, Marsden; Law, Isleworth; Talbot, Hastings; Yeoman, Barnard Castle; Valentine and Sons, Dundee; Foster, Croydon; Laing, Shrewsbury; Turnbull and Sons, Glasgow; Simmons, London; Bailey, Shrewsbury; Glaisby, York; Partridge, Andover; Robinson, London; O'Shea, Limerick; Norval, Dunfermline; Erwin, Ballymena; Watson, Ripon; Archer Clarke, London; Findlow, Warwick; Berry, Aberdare; Evans, Pwllheli; Fisher, Filey; Clarke, Bethesda; and Byrne, Richmond.

The Chairman said: "Gentlemen, it gives me great pleasure to see such an important gathering as this in response to the invitation sent out to you throughout the length and breadth of the United Kingdom, an invitation, gentlemen, initiated at a gathering of a few kindred spirits three weeks ago at the important centre of Leeds, where a number of us met and discussed the necessity for forming ourselves into an association for the purpose of looking after the interests of those engaged in photographic art as a means of livelihood, and also to attempt an improvement of the social status of the members of the profession. Grievances have arisen, and those matters are only to be met by combined action on the part of the profession generally in order to effect a remedy. A committee was formed, as you are doubtless aware, and the requisite funds were forthcoming to cover the preliminary expenses incurred in announcing to the large body of professional photographers the objects of this meeting."

The minutes of the meeting held at Roundhay Park Mansion, Leeds, were then read, and adopted by the meeting unanimously, and signed by the Chairman.

Mr. Slingsby then said: "Gentlemen of the photographic profession, you have not been invited here to assist in the formation of a Society antagonistic to the parent Society—the Photographic Society of Great Britain—or any similar Society which meets and discusses the prospects of the art of photography in its scientific aspects; neither to act as a Society for the distribution of medals or awards at exhibitions; but to form yourselves into a powerful combination, so that you can deal in a proper manner with matters appertaining to the business difficulties which have arisen, and are likely to arise in the future; such difficulties can only be met by a properly constituted association, having a powerful membership, and a good balance at the bankers. The various anomalies which exist in the practice of photography as a business do not exist in other businesses—the publication of manufacturers' price lists, which do not treat the profession with justice. It is my opinion, and I feel certain it is yours, that manufacturers and dealers would gladly work with you to abolish these anomalies. Then, gentlemen, I think this Association should be established on a broader basis than at first proposed, and that we should invite all concerned to join with us, and to make it a national society, and call it, instead of the Professional Photographers' Association, the National Photographers' Association, which would, in my opinion, be a higher and a nobler title to usefulness, and would take away from it any idea of one-sided selfishness. The *raison d'être* of its existence should be the adjustment of difficulties that arise, and to deal with them as a body instead of the onus being thrown upon an individual. Take, for instance, the various Copyright Acts which have been before Parliament at one time or another. Had the last one of its kind become law it would have been very awkward for professional portraitists in general. Any intended future Copyright Act should be discussed, and any injurious clauses to the detriment of the profession be mitigated by the action of the council of such a Society as this. Then, again, we have the question of the ownership of the negative now and again cropping up. When I tell you that I once stood as defendant, and prepared to contest this some fifteen years ago in the court of Queen's Bench, you will admit this question is an important one. You have, again, the improvement of the status of the profession, and I feel sure you will agree with me that if a photographic artist could put after his name "Member of the N.P.A.," it would stamp him as being a trustworthy member of our craft, deserving the patronage of the public. I would suggest that the subscription should not be less than 21s. per annum; that you should have a president, vice-president, and a council; also a secretary with a salary sufficient to make it worth his while to devote part of his time to the work of the Society; also that the meetings of the council be held quarterly, or as circumstances will admit. An annual gathering of the members of the Society should take place at different important centres, as done by other organised societies. At these meetings matters of interest and papers relating to the business of the profession might be read and discussed, and the action of the Society agreed upon. This would bring individual members into closer relationship, and promote a better feeling amongst those engaged in the pursuit of our art. Again, as we are growing in numbers, the rank and file of our assistants are increasing, and the question of suitable hours of labour and of proportionate payment may have to be adjusted to the interests of both employers and assistants. Likewise, gentlemen, you may, in some degree, ameliorate the very low prices that some work under, and by your recommendation remedy the effects of cutting down prices between rival photographers in the same locality. These are some of the lines of usefulness I have sketched out, and in the event of this Society being successfully carried on, the advice and assistance of its council would be asked when any important measure was being brought before Parliament, as to the means of putting in accord with the feelings of those engaged in the pursuit of the art."

A discussion took place upon the speech, and several resolutions were proposed and carried, amongst which was one that the title of the Society be the National Association of Professional Photographers, proposed by Mr. Lafosse, seconded by Mr. Whitlock.

A committee of twenty was proposed, elected to frame rules and bye-laws, and to report upon the same to a general meeting to be held in Birmingham early in the ensuing year; the hon. secretary to announce the date by advertisement in the photographic journals.

The following are the members of the committee:—Messrs. Slingsby, Lafosse, Richards, Sutcliffe, Warwick, Brookes, Whitlock, Crosby, MacIver, Gill, Elliott, Fall, Shaw, Gregson, Davis, Whaley, Pattingall, Moffat, Birtles, Eddison, Barry.

PRESIDENTIAL ADDRESS TO THE GLASOW PHOTOGRAPHIC ASSOCIATION.

BY WILLIAM LANG, JUN., F.C.S.

GENTLEMEN,—Before touching upon more general matters, my first duty is to return you my warmest thanks for your renewed confidence in me in having so spontaneously and generously continued me in the highest office which it is in the power of this Association to bestow. It is now more than five years since I became your President, and it is most satisfactory and gratifying to myself that the Glasgow Photographic Association, one of the oldest societies in the kingdom, finds itself at the present moment in a state of flourishing activity. Our membership is now continually being added to, and I see no reason why we should not be still stronger numerically. One of your office-bearers remarked to me the other day that he could not understand why such and such an one engaged in photography commercially did not countenance our work as an Association by becoming members. My reply was, let them alone; our duty as an Association is to keep going on in the even tenor of our way, by bringing before the Society all matters appertaining to photography, whether they may bear on the scientific or on the art side of the question; by the exhibition of novelties as they appear from time to time in the photographic world; by keeping ourselves posted in the work of our contemporaries, and bringing forward their published results. Surely all this, if it be continued in, as I hold it has been for the last few years, will ultimately awaken interest and sympathy in those who perhaps may hold aloof from us, and by-and-by, unsolicited and unasked, they will join our ranks. I feel a certain pity for the superior individual who, when spoken to as to his becoming a member of the Glasgow Photographic Association, gives answer in tones which are intended to convey loftiness and superiority—"I do not believe in Associations." I think, gentlemen, such an one with views so biassed, and, shall I also add, so small, would not be any credit to us; therefore I say let him alone. Then, again, I would like to refer to another phase of indifference to the work done by us as an Association, and here we have to find fault with the action of certain actual members, those who pay their subscriptions, but who never honour us with their presence. We want the subscriptions, certainly, but we would like the subscriber himself—sometimes, at all events. I offer these criticisms,

gentlemen, in no unfriendly spirit. I do so because I think all should contribute their little to the furthering of the aims and purposes of our Association; and I do not for my part see how members who are conspicuous always by their absence can be said truly to promote the said aims and purposes. Before I pass on to the consideration of topics more photographic than the preceding, I would simply in a word wish to congratulate you on the council which has just been appointed. I feel sure that it is what may be termed a true working council. The remarks I have made with reference to the non-attendance of the ordinary members would surely apply in still stronger force to members of council. Last year two members were, from some cause or other, made members of council who never once attended a single council meeting. This is not as it should be. I therefore look forward to increased help this session, for from what I know of each one of the members of the council, they all have that interest in the affairs of the Association which is absolutely necessary for its present and future welfare. We all know that a certain game of cards can be played with a dummy, but I have yet to learn how the affairs of a society can be managed on similar lines.

As you are aware, those who practise photography may be broadly classed as amateurs and professionals. The Glasgow Photographic Association, as you know, embraces both sections; there is, therefore, need that both interests be provided for. The council returned contains, I think, a happy admixture of both elements. Some may think that the millennium cannot be far off—that is, the photographic millennium—when the lion and the lamb thus come together; but the true spirit which should imbue all of us, be he amateur or be he professional, is the advancement and development of that ever-wonderful and fascinating art-science of ours, now known and practised over the whole civilised world.

A sign of the times of the great interest which is everywhere evoked by photography may be cited in the great number of exhibitions which take place one after the other in the various centres of Great Britain. There was the Crystal Palace Show in the spring; another one was held in the Drapers' Hall, London, in the month of June; Newcastle had a most interesting and exhaustive exhibition; while there has been but recently opened in the Scottish National Art Galleries in Edinburgh one which promises to be a success all round. The annual Pall Mall collection has, as usual, been held in the customary place. Then, again, in the People's Palace to be presently formed in the east end of our own town there will be a photographic collection which should command attention.

The Photographic Convention of the United Kingdom held their fifth meeting in Chester during the month of June; Mr. C. H. Bothamley, of Leeds, was the President. The gathering was a success in every way. Perhaps the most notable or most ambitious attempt was a magazine camera, brought forward by Friese Greene, to take ten photographs a second of the various phases of motion by simply turning a handle; these, when recombined and projected on a screen, show again the original motion. An important contribution was also given by an honorary member, Mr. Andrew Pringle, on "Photo-Micrography." I was not able to be present myself at Chester, but our Association had a good representative in Mr. Mason. The next meeting is to be held in Bath, which may be denominated classic ground, for Fox Talbot lived in its vicinity, and many of the subjects to be found there have been secured by the illustrious pioneer.

(*To be continued.*)

THE Pope, it is said, has re-established the Observatory at the Vatican. The Pope's astronomers will take part in the making of the great map of the heavens now being prepared by means of photography. The constellation of the Lion is the part which has been allotted to the Vatican Observatory.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—December 18th, ordinary meeting, which will be the last meeting at Masons' Hall Tavern; January 1st, 1891, opening meeting at the new quarters, at the Champion Hotel, Aldersgate Street, close to the G.P.O. Visitors are invited.

Patent Intelligence.

Applications for Letters Patent.

19,658. A. J. BOULT, 323, High Holborn, London, "Photographic Films." George Eastman, United States.—December 2nd.

19,672. H. H. LAKE, 15, Southampton Buildings, London, "Photographic Baths." Constant Monnier, France.—December 2nd.

19,714. J. B. BAYLY, 18, Fulham Place, London, "Focussing Attachment." Frederick Quinly, United States.—December 3rd.

19,733. R. SLINGSBY, 115, Cannon Street, London, "Flash-Lamp Appliances."—December 3rd.

19,738. C. H. BAINES, 45, Southampton Buildings, London, "Cameras."—December 3rd.

19,797. R. ENGELHORN, 18, Buckingham Street, Strand, London, "Removing Photographic Plates from Storing Boxes into Exposing Frames."—December 4th.

19,907. P. J. HARRINGTON and V. W. WOOD, Newport Road, Middlesborough-on-Tees, "Detective Hand-Camera."—December 6th.

19,933. J. B. BROOKS, 115, Great Charles Street, Birmingham, "Lamps or Lanterns for Photographic Purposes."—December 6th.

19,934. J. B. BROOKS, 115, Great Charles Street, Birmingham, "Boxes and Frames for Holding and Suspending Glasses, Negatives, Cards, Plates, and the like for Photographic Purposes."—December 6th.

19,935. J. B. BROOKS, 115, Great Charles Street, Birmingham, "Bath Levers for Photographic Purposes."—December 6th.

AT the Solar Club dinner last Monday night, Mr. Slingsby took several photographs, by the magnesium flash-light, of those present.

THE TUNBRIDGE WELLS PHOTOGRAPHIC EXHIBITION.—At the opening of this exhibition, Sir David Salomons said that unless he were mistaken, their previous exhibitions had been largely to encourage local art by a friendly pat on the back, and the judges awarded medals more as a matter of encouragement. Fortunately, as was proved by the exhibition that day, the Society had passed that stage; this was a more extended exhibition, with excellent work from all parts of England. The next step to the pat on the back in the way of encouragement was the slap in the face. Some of the exhibitors who had fairly expected to again take medals had not done so, and might be a little disappointed. Their exhibits were, however, meritorious; but people at a distance had done better work, and that must also encourage other exhibitors to go on and do better on another occasion. It was a matter for congratulation to see so much good work, and to see that from a handful of about half a dozen amateurs this very considerable Society had arisen, and affiliated itself with the greatest photographic society in the world, the London Camera Club, and was not only taking up its own position, but standing well in respect to the other societies of England.

RECEIVED.—From the Thornton-Pickard Manufacturing Co., a plumb-indicator to assist in levelling the camera. It is represented in the accompanying cut, and is a serviceable adjunct, neatly made, easily fitted on the camera by anyone, and well "finished," so as to present no sharp edges or corners.——From Mr. Walter Tyler, a neatly made printing frame, by means of which nearly the whole of the print can be raised for examination, while the other part, by means of a special device to prevent slipping, is held firmly in position on the negative.——Mr. Freshwater's fleas are well known to London photographers, especially the one as large as a house when it was seen on the screen at a meeting of the Photographic Convention. His fleas and other of his insects and parasites—we mean, of course, his excellent micrographic slides of them—are fully described in a pamphlet just published by Messrs. Newton and Co.

Correspondence.

THE PLATINOTYPE COMPANY.

SIR,—In your report of a meeting of the Photographic Society of Great Britain, held on the 25th November, Mr. Chapman Jones is reported to refer to the Platinotype Company as having stated that strong hydrochloric acid reduced the strength of black platinum prints. There must be some mistake in this reference; certainly we have no recollection of having made such an assertion, which, indeed, would involve what is contrary to experience, for we have never yet succeeded in reducing the strength of a black image by any length of treatment with this acid. PLATINOTYPE CO. (E. J. H.)

29, *Southampton Row, High Holborn, W.C., December 4th.*

PHOTOGRAPHIC TRADES PROTECTION SOCIETIES.

SIR,—I am pleased to learn that there is a probability of a Trade Protection Society for professional photographers; for the last twenty years I have felt the necessity of such a combination.

We could then agree to deal only with those firms which, in the first place, pay the carriage on their goods, or deliver them by their own vans free of charge, at all events within the London radius, according to the custom of all other trades.

In the second place, I think that manufacturers should be held responsible for bad and carelessly prepared plates, paper, mounts, and other goods.

With regard to ourselves, I think the question of uniformity of prices better left alone; like the eight hours movement, it is a very ticklish matter with which to cope. I trust that we shall soon have a large meeting in London, and that my professional brothers will rouse up and shake off their usual apathy.

AUGUSTUS W. WILSON.

13, *Dalston Lane, Kingsland, London, December 9th.*

THE CAMERA AND ITS VARIOUS MOTIONS.

SIR,—In your last issue under the above heading, it is stated that Meagher's form of camera, in its simplest form, does not very readily lend itself to any great extension, and

Fig. 1.

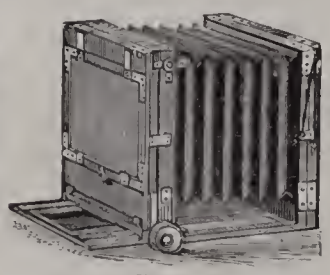


Fig. 2.

that the tailboard comes in the way in focussing when a short focus lens is used.

Fig. 1 shows the camera closed, Fig. 2 shows the camera partly extended, and Fig. 3 shows the camera with front extended. The advantages of this camera are, that it allows of considerable expansion, the half-plate focussing from $3\frac{3}{8}$ inches to 20 inches, and is quickly adjusted for long or short focus lenses; that it is perfectly rigid when extended, and there is no projection of the baseboard in front of the lens. The bellows being parallel, it is available for use with the shortest focus wide angle lens. It can also be fitted with centre partition for stereoscopic work, or with repeating front for one or more pictures on the plate. There are no loose screws required in fixing the camera, and the time occupied in unpacking and fitting the camera on the tripod stand is thirty seconds.

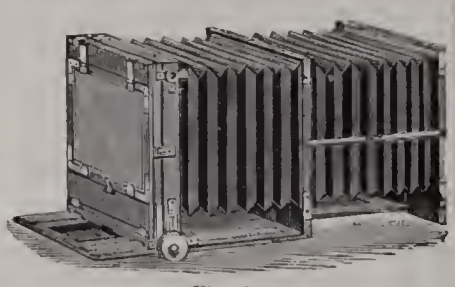
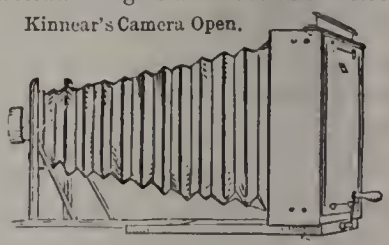


Fig. 3.

The focal lengths given above apply to a camera with rack adjustment. If fitted with screw adjustment, the focal length would be about 2 inches less.

Fig. 2, as extended, shows the position of the camera when in use with an ordinary half-plate view lens, say of 7 inches focus. With a lens of 3 inches shorter focus there would be no difficulty in focussing. In the early sixties I made a large number of the Kinnear cameras. I give an illustration here similar to what appeared in my catalogue of that time; but one defect in that form of camera is, that the folds of the bellows body, after a little use, are apt to bend inwards, thus cutting off a portion of the field when long focus or short focus wide-angle lenses are used. It is difficult to make this form of camera rigid when extended, and this difficulty is increased if an instantaneous shutter is used on the lens.

Kinnear's Camera Open.



P. MEAGHER.

21, *Southampton Row, W.C., December 8th*, 1890.

[Mr. Meagher has exhibited to us his extension camera described in the above letter; it is of sturdy and durable make, quickly put up, and remarkably rigid when extended. His statement that it can be put up in thirty seconds is accurate.—ED.]

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

SIR,—I have received so many letters in reply to the circular I issued calling a meeting in Manchester, I find it impossible to reply to each.

May I trespass upon your space to call the attention of those gentlemen who ask for information as to the objects of the Association, to the report of the proceedings, a copy of which I enclose for insertion in the current issue, and also to the fact that it is proposed to hold a general meeting of the profession at Birmingham early in the ensuing year, of which due notice will be given by advertisement in the photographic journals.

At this meeting the committee appointed will submit a proposed code of rules and bye-laws for the approval or otherwise of the profession. I therefore hope all photographers will make an effort to be present.

The need of such an association is evident from the tone of the letters I have already received from all parts of the United Kingdom, and, with a combined effort, I feel sure the Society can be established upon a firm and permanent basis, and will be of great service to its members.

CHAS. P. RICHARDS, *Hon. Sec. pro. tem.*

Cavendish Studio, Barrow-in-Furness, Dec. 3rd.

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the ordinary meeting of this Society, held on Tuesday evening, the 9th inst., the chair was occupied by the president, Mr. JAMES GLAISHER, F.R.S.

A paper on "Photography applied to Astronomy," by E. W. Maunder, F.R.A.S., was to have been read at this meeting, but as it was found the oxy-hydrogen light necessary for the lantern illustrations could not be used in the Water Colour Society's Gallery during the continuance of their exhibition, the paper had been deferred until the January meeting, to be held at the Society's new premises.

The honorary treasurer, Mr. W. S. BIRD, briefly explained what had been done by the committee appointed to make arrangements with regard to these premises, situated at 50, Great Russell Street, and members were invited to express opinions concerning the hours at which they should be opened for their use. It was decided that the hours should be from 2 till 9.30 daily, but that there should be a vacation to occupy the whole of the month of August. When necessary, and on special occasions, meetings would be held as heretofore at the Pall Mall Gallery, which was also engaged for the Society's

exhibition ; but in the general way the meetings, both ordinary and technical, would be held in the new premises. As they now had room for a library, and for a nuclens of a photographic museum, the premises committee was prepared to accept gifts of books and other articles.

Mr. LEON WARNERKE thought that arrangements should be made for a more complete supply of foreign periodical photographic literature than the Society now possessed.

The TREASURER referred to the announcements concerning the proposed Photographic Institute which appeared in the Society's Journal. The proposals there put forth included a large scheme as well as a smaller one. The Society might act as nursing-mother to the larger scheme, which he looked upon as belonging to the future. He thought that some of the accumulated funds of the City Corporations might be expected to be used largely in aid of the proposed Institute, provided its practicability and utility could be sufficiently demonstrated ; but they must begin at home if they were to have any chance of success. The Institute, if sufficiently supported, would be a most valuable one. In England we must help ourselves, and must not look for State aid such as is furnished to the Photographic Institute in Berlin.

It was moved by Mr. T. SAMUEL that the project be submitted in the form of a circular letter to the different provincial societies, to elicit the opinion of the photographic public generally on the scheme submitted by the committee.

Mr. H. CHAPMAN JONES seconded the motion, and said that there were a great many societies that might be expected to help in the foundation of the Institute. Such help might be looked for from those societies which were rather of a scientific than of a social character.

Mr. W. BEDFORD thought they should not look for very much assistance from societies, and should not be much influenced by the amount they would be likely to get in this way. Photography was certainly an art and science that should receive aid from some of the accumulated wealth of the City.

The motion was put and carried.

Messrs. J. E. Austin, L. C. Bennett, B. Yorke Bevan, Louis M. Biden, Shapoor N. Bhedwar, F. C. Cembrano, L. E. Clift, H. Cooper, J. H. Craigie, Captain H. Curties, J. C. Douglas, D. T. English, F. M. Gowar, C. F. Hayward, Lieut. S. G. Johnson, W. F. Kimberley, Major H. G. Kemhardt, Lieut. W. G. Leslie, A. Maskell, L. Mitchell, H. Sandilaud, E. Seamell, E. Spencer, J. Wiltshire, L. E. Westrop, H. H. Schultz-Young, Miss W. P. Arnott, and Mrs. E. G. Wrigley were elected.

THE CAMERA CLUB.

ON Thursday, last week, at the ordinary meeting of the Camera Club, Mr. A. MASKELL presided.

Mr. H. STURMEY read a paper on "The Rollable Transpareut Film," and stated that the makers have now got rid of the occasional markings, due to electrical action, which had proved so troublesome in the earlier specimens. A mark like a join appeared in each roll, and this the makers did not seem as yet to have been able to abolish. The speaker described the mode of manufacture of the film, and how he developed, fixed, and dried the negatives.

The CHAIRMAN exhibited some film negatives taken by Major Nott, who is one of the ablest workers on films in this country.

A discussion followed, in which several members took part.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

Mr. EDGAR CLIFTON in the chair.

Mr. A. MACKIE drew attention to some lanteru plates coated with collodio bromide, the films of which were more or less covered with transparent spots. He said that a discussion had been raised whether each spot proceeded from a nuclens. To test this he coated several plates, and before they were quite dry allowed some dust to settle on them ; after the plates were thoroughly dry the dust was blown off, and a plentiful supply of spots was the result. He next coated some plates with an emulsion which had not hitherto produced spots after coating ; these were dusted as in the previous case, but it had no detrimental effect upon the plates. Mr. Mackie contended that this proved it was only certain emulsions that were susceptible of being damaged from the above cause.

A demonstration was given of the diazotype process by Mr. BEVAN, of the firm of Messrs. Green, Cross, and Bevan. The process can be used either for dyeing fabrics or for positive printing by means of the diazo derivative of primuline. Primuline is a yellow coal-tar dye, discovered in 1887 by Mr. A. G. Green. To demonstrate the process Mr. E. J. Bevan took several pieces of fabric ; these were immersed in a bath of water, heated by means of a Bunsen burner to boiling point, a little of the primuline powder having been previously sprinkled into it. A few minutes sufficed to dye the pieces of cloth a permanent bright yellow colour. Primuline itself is not sensitive to light, but a diazo compound is formed by allowing the pieces of material, after dyeing, to remain a few minutes in a bath of nitrous acid. This bath is prepared by dissolving 30 grains of sodium nitrite in one pint of cold water, adding 50 grains of oxalic acid dissolved in one ounce of cold water. The pieces of fabric are, by immersion, rendered sensitive to light and capable of producing photographic prints of a novel character and in various colours. A peculiar feature of the process is that it gives a positive from a positive. Printing may be done in an ordinary printing frame, or the sensitised material may be spread on a board, and the subject to be copied placed on it and pressed flat by means of a glass plate. In this way fronds of ferns, leaves, and other objects can be arranged so as to form very pretty designs. After exposure the materials are transferred from the printing frame to a bath of a weak solution of a phenol or amine, producing colour where the ground has not been decomposed by light, the colour produced depending upon the phenol or amine employed. After washing and drying the print is fixed ; linen, silk, wool, paper, and all materials of this description can be used in this process. In the case of gelatine plates the primuline is incorporated with the gelatine before coating. Some pieces of silk on which designs were printed in various colours were passed round.

A pretty application of the process was shown by Mr. Bevan. A piece of white calico which had been sensitised and exposed during the day under some fern-fronds was locally developed with a brush, several developers being used, producing various colours, but feeble on this occasion from over-exposure.

Mr. W. H. HARRISON asked if isolated diazotised primuline were not explosive.

Mr. A. G. GREEN said that all the diazo compounds were explosive, but diazotised primuline was somewhat stable, and could safely be kept in a bottle. He remarked that these compounds were stable to heat, although so readily decomposed by light. The diazo compounds were all sensitive to light, being about twice as sensitive as ordinary sensitised albumenised paper—the proportion being much greater with yellow light.

In reply to questions, Mr. BEVAN said that other acids beside oxalic could be used with nitrite in the production of nitrous acid, the strength not being important provided sufficient acid was added. He was unable to explain the nature of the chemical change produced by light ; the fact that nitrogen was set free was proved by placing an exposed gelatine film in water, when the image could be traced by the bubbles of nitrogen that were given off. He had collected this gas in order to determine the amount of nitrogen given off, but this was a matter more of scientific than practical interest.

The CHAIRMAN asked if it were possible to get a black image, and whether it could be toned.

Mr. BEVAN said the nearest approach to a black colour they had been able to obtain was a very deep purple ; various tones could be produced by stopping development and using another developer for producing another colour. They had not been able to get a pure white background. Even results were more likely to be obtained when weak solutions were used. The image was capable of being redeveloped to any colour *ad infinitum*. For copying engineers' plans and drawings, he thought diazotype would supersede the old blue process.

A vote of thanks to Messrs. Green, Cross, and Bevan, proposed by the Chairman, brought the meeting to a close.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION. *December 4th.*—Mr. J. D. Cox (president) in the chair.

The principal business of the evening was a lantern slide competition, in which thirteen members took part; each contributed a set of six slides. The competition was decided by the votes of the members present. On the voting papers being scrutinised, the following were declared the prize winners:—First, H. S. Wybrants; second, D. Ireland; third, A. Stewart.

A number of slides by the members, and a series of fifty from the Paisley Photographic Society, were then exhibited.

Messrs. Lowdon, Reform Street, sent for exhibition a set illustrating the Stanley expedition for the relief of Emin Pasha.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING was held on October 11th, at the rooms of the Geographical Society, Tokyo.

There was an exhibition of work done by members during the holidays; it included a pretty fair collection of pictures, but it is to be regretted that more members were not represented. Probably the fact that only some seven or eight exhibited is due to the very unfavourable weather that there has been during nearly the whole of the summer.

Mr. KAJIMA SEBI showed a number of remarkably fine flower studies, and some coloured prints on "aristotype" paper.

Mr. C. D. WEST had a set of prints, of which two of the ss. *Omaha*, taken from the yacht *Daimyo* whilst both vessels were in motion, were remarkable.

Mr. J. B. RENTIERS and Mr. A. J. HARE each showed a set of fine landscapes.

Prof. W. K. BURTON had a number of pictures of children bathing, taken at Misaki. Some of these were printed both in the ordinary way, and on drawing paper with platinum toning, and were also enlarged on bromide paper, so that there was an opportunity of comparing notes as to the effects of different processes.

Captain W. H. HARDY showed a print of a life boat, which attracted attention on account of its representing all that was left of the steamship *Musashi Maru* after the late lamentable accident.

Mr. S. OYAMA brought a fine collection of copper-plate engravings, and of photo-engravings.

There was on show the apparatus with which certain professors of the University had made attempts, more or less successful, at deep sea photography during the summer holidays, and which had resulted eventually in an explosion.

A short business meeting was held, at which the following were elected:—Mr. W. Mann, Mr. S. Oyama, and Mr. H. A. C. Boner. After this the meeting resolved itself into a conversazione.

IDEALISTIC PHOTOGRAPHY.—The London and Provincial Photographic Association has recently heard a great deal about the focus question—"Pictorial Definition," read by Mr. A. Collier; "Is Blurring desirable in a Photograph?" by Mr. Debenham; and "Naturalistic Definition," by Philip H. Newman. One would have thought it would have had an alternation of papers by readers of opposite opinions. "Hear all sides" implies a spirit of justice, and where there is prejudice the search for truth is vain.—*The Photographic Art Journal.*

CHEMISTRY IN THE DARK ROOM.—A lecture on "Chemistry in the Dark Room" was delivered last Saturday at the Photographic Exhibition, Edinburgh, by Dr. Drinkwater, Lecturer on Chemistry at the Edinburgh School of Medicine. There was a large attendance. Having explained the difference between physical and chemical change, the lecturer showed the composition of white light, throwing the spectrum on a screen, and further pointing out the different properties of each end. He demonstrated the invisibility of light by itself, and the effect of passing it through coloured glass. The chemical nature of the spectrum was then treated of, and the lecturer exhibited its power of acting on photographic salts by darkening a piece of sensitised paper by exposure to magnesium light. The nature of the various chemical changes in photography was shown and carefully explained.

Answers to Correspondents.

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

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

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

C. J. K.—*Hot Rolling Press.* The "Fernande" burnisher ought to meet your requirements, being suitable both for mounted and unmounted prints according to adjustment, and can be used hot or cold.

E. E. M.—*Gelatino-Chloride.* The advantages of Obernetter, celerotype, and other forms of gelatino-chloride paper are asserted to be greater brilliancy and rapidity, combined with better rendering of the details in shadow. You will find formulæ for toning baths, and directions for making gelatino-chloride emulsions, in the new YEAR-BOOK (see pages 99, 134, and 187). Be sure and use an alum bath before toning the prints.

PARATOLOID.—Your question has no bearing on photography, and it is impossible to say more than that the similarity of name would seem to indicate that Dr. Koch's cure—the so-called "Paratoloid"—is a preparation of paratolnidine, the body that serves as a starting point for the manufacture of primuline base.

R. S. D.—*Lens for Enlarging.* The lens mentioned as being already in your possession ought to do all the work you require of it, even to enlarging from whole-plates.

H. J. C. (Lewisham).—*The Journal of the Society of Chemical Industry* (30s. per annum) is to be had of Messrs. Eyre and Spottiswoode, East Harding Street, E.C. The separate monthly copies are only supplied to members. By joining the Society you would gain certain privileges besides getting the journals. We shall be happy to propose you for election.

PHOTARGUS.—1. Instead of using hydrofluoric acid for stripping gelatine films from glass, a mixture of dilute sulphuric or hydrochloric acid and fluoride of sodium will answer equally well. 2. Gelatine skins are still commonly employed, or the films may be reversed and received upon the original glass plate. Celluloid is apt to curl up in the process. 3. You are right, it is a common practice; use slow landscape or chloride plates. 4. Aniline dyes for spotting have not the needful opacity, nor has the soluble black any special affinity for albumen. By using a little gum water with the pigment the points touched become equally glossy with the rest of the surface.

WANTED, a lecture experiment to show manifold changes of colour in the same solution. Probably the following set of reactions would be suitable:—Copper wire or filings dissolved in strong nitric acid give a greenish-blue solution, and red gas; hydrochloric acid added turns bright green; diluted with water, pale blue; ammonia in excess, deep azure blue; cyanide of potassium, colourless; sulphide of ammonium, black. If this will not do, you might ring the changes on permanganate; from purple, green, colourless, to flesh-coloured sulphide.

W. AFRICA.—1. You are free to employ the Woodburytype process, but the cost of hydraulic press and general plant is, of course, rather expensive. 2. Details have appeared in the photographic journals, but there does not seem to be any book of instruction solely devoted to it.

L. F.—*Warming the Studio.* The gas stove you mention is very efficient, and serves to ventilate the room by the introduction of warm, fresh air. We have, however, known the gas flame to be blown out in gusty weather; this should be provided against by having one jet of larger size in the compound ring burner.

RECEIVED.—Mathews' plates illustrating a geometric system of personal identification by photography; also Webster's "Benzene Nucleus" india-rubber stamps.

Other correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE PHOTOGRAPHIC SOCIETY.

AT the beginning of the new year the Photographic Society will move into rooms of its own in Great Russell Street, and, at the same time, a new era in its existence will begin. This old and honoured Society was inaugurated in January, 1853, at a meeting held in the great hall of the Society of Arts, with Sir Charles Eastlake, president of the Royal Academy, in the chair. He was elected as the first president of the Photographic Society, and the first vice-presidents were Earl Somers, Sir William J. Newton, and Sir Charles Wheatstone. The members of council appointed at the outset were Dr. Becker, Mr. L. Berger, the Rev. G. Bridges, Dr. H. Diamond, Mr. Roger Fenton (hon. sec.), Mr. Peter Le Neve Foster, Mr. P. W. Fry, Mr. T. M. Goodeve, Mr. Robert Hunt, the Rev. C. Jones, Mr. J. D. Lewellyn, Mr. Neville Maskelyne, Mr. A. Maconochie, the Count de Montizon, Mr. H. Owen, Dr. John Percy, Mr. A. Rosling (treasurer), Captain Scott, Mr. G. Shaw, Mr. Charles Vignolles, and Sir Thomas Wilson. For some years it was a fashionable society. After a time it ceased to bear this aspect, and, in course of years, fell into anything but a prosperous state commercially. The amount of the salary which it paid to its permanent secretary had much to do with the reversal of its fortunes. Of late years it has become more prosperous, and has been leading a sedate jog-trot kind of life, displaying activity chiefly in the holding of an excellent annual photographic exhibition.

When a great photographic society is without a library, without a reading room, practically, if not absolutely, without a supply of foreign photographic periodicals, and lives apparently cut off from communication with all the photographic societies in foreign countries, it is clear that a time must come for the awakening from this state of blissful repose.

Some years ago the Belgian Photographic Association tried to hold an International Congress of Photographers, and it fell through simply because so many photographic societies in other countries had not the politeness to answer the letters sent to them by the Belgian Association on the subject. At the time of the last Paris Exhibition the French took up the idea of an International Congress, and the responses from photographers in other nations were not so numerous as should have been the case; however, the International Photographic Congress was held in Paris, and did most useful work, especially in the matter of selecting a standard unit of light for photographic purposes, and in setting forth methods of testing lenses. Either our Photographic Society did receive communications from the Belgians and the French in these matters, or it did not. If not, our Continental neighbours were lacking in courtesy; if they did send such communications, how is it that not a word on the subject, if we mistake not, has ever been uttered at an ordinary or extraordinary meeting of the Photographic Society? A few questions might well be asked as to how it is that, for years past, the Society seems to have been so entirely cut off from communication with organisations of the same kind in other parts of the world.

However, the Society is now beginning to show more signs of activity. Perhaps the time may be at hand when it will be impossible to reasonably put such questions as those just formulated, and probably the Photographic Society may be about to start afresh on lines of action fully in harmony with its historical standing and its honourable name.

MAKING PAPER TRANSPARENT.—The following method of making paper transparent for copying drawings is adopted by the Austrian Hydrographic Bureau:—The sheet of paper, having been placed over the drawing to be copied, is lightly rubbed with a ball of cotton saturated with pure benzine. The tracing can then be readily made, owing to the transparency produced, and the benzine, on evaporating, leaves the paper opaque, as before, and perfectly odourless. To secure satisfactory results, however, absolutely pure benzine must be used.

THE PRICE OF PLATINUM.—As good news to photographers, it may be mentioned that a fall has taken place in the price of platinum, a new source of supply having been discovered in Australia. Dr. Edison is said, in the newspapers, to have hopes of manufacturing a substitute for platinum; this, necessarily, must mean a non-oxidising alloy for electrical contacts, and not anything chemically the same as platinum, but if the latter metal were not required by electricians, it would become cheaper to photographers.

PHOTOGRAPHY IN ITS RELATION TO COMMERCE.

IN the eagerness of photographers, both professional and amateur, to keep themselves posted up with the details of new processes, and the thousand and one things that attract the attention of those interested in the art, the very important part which photography has now assumed in the commercial world is apt to be forgotten. If the chief workers in photography were, as of yore, professional portrait takers, the industries partly or wholly dependent upon it must have been small industries, or, at any rate, affected by the wants of photographers to only a limited extent. But now that the art has assumed the character of a craze or hobby in which many thousands in every country take an active interest, the number of persons who directly or indirectly owe their daily bread to sun-painting is enormous, and, of course, the industries in which they are engaged benefit to a similar degree.

There are a few semi-scientific pursuits which have, in by-gone days, had their worshippers among amateurs, but none can compare with photography in the enthusiasm with which it has been taken up of late years by all classes. Perhaps the hobby which came nearest to it in this respect was the art of electro-plating, which numbered many hundreds of amateur workers very soon after its discovery. It would seem that any new industry which has a taste of the marvellous or magical about it, at once appeals to the imagination of ordinary folk, for we are all more or less superstitious to a certain extent; and it seemed almost akin to magic when a sealing-wax or plaster mould placed in a chemical solution in connection with a battery circuit became covered, in a short time, with a shell of solid metal. The art of photography presented a still more wonderful change brought about by such an intangible thing as light, and in the marvels of the new art the attractive features of the older one were forgotten.

It is certainly good for anyone to have a hobby—some occupation whereby thought can be rendered active, and which is as different as possible from the ordinary occupation of the individual. But the hobby rider will have still more satisfaction with his choice when he remembers that his pastime is one that brings harm to no one, does not—as many pastimes unfortunately do—bring pain and death to lower animals, and which, at the same time, affords the means of living to many thousand workers among the human family. That this is true of photography there can be no question. Besides, there is a farther advantage in the practice of the fascinating art which, perhaps, is not readily recognised. We feel certain that many workers have first been attracted to the study of optics and chemistry by the necessary knowledge of those subjects which the practice of photography entails; and who knows what results may accrue to science from the attention of one or two good brain-workers being thus started on a particular track?

It would be a very difficult matter to estimate with any approach to correctness the number of those who minister to the wants of the photographic world. First, we have a very important new industry established in the manufacture of dry plates. In association with such factories, we find that the glass worker is called upon for an enormous quantity of material. At one factory we were told, on good authority, that the bill for glass alone amounted to more than two hundred pounds monthly. The account for silver and other chemical salts, and for gelatine, would, it is evident, add up to no insignificant amount at such a factory. Then reams of packing paper must also be taken into account, as well as thousands of gross of boxes of various sizes, in which the plates are packed before they are ready for market. At most of our large plate factories other work is also carried on, such as the preparation of albumenised, bromide, and chloride papers, besides a host of incidental productions which need not be mentioned in detail. We may be reminded here that the paper maker shares in the general work of photography, not only in the manufacture of suitable material to serve as the basis for our pictures, but also in the making of tons of paper to satisfy the requirements of the photographic newspapers, and to help in the production of the many books which deal with different phases of the art.

At no time in the history of photography was so much apparatus turned out as is the case to-day. Camera-making engages the services of a host of skilled cabinet workers, who call upon the wood merchant for the finest woods in his store, upon the leather dealers for the best skins, and upon the metal-workers for the most highly-finished brass. We must not forget those without whom the photographer would be powerless, unless, indeed, he were content to represent nature in the fuzzy garb peculiar to the employment of a pin-hole. We, of course, mean the lens manufacturers, who have done so much to bring the photographic art to its present pitch of perfection. We thus see that the large and increasing army of photographers has in its train a huge band of camp-followers. But these, instead of proving a nuisance and encumbrance to the main body, as such congregations of men have often been known to be, support and nourish it. The army, in fact, could not exist without them.

HALATION.—A. and L. Lumière show, in the *Bulletin Belge*, that part of the halo is due to diffusion of light in the sensitive film, and part to the passage of luminous rays through the film. By covering the sensitive plate with a screen, pierced with an opening exactly the size of the luminous image, it was found that the halo formed was so small that it might be ignored. When, however, the film was protected from the image by a black screen the exact size of it, an ordinary halo was obtained. Consequently, the authors conclude that the halo is due to two causes—the support and the lens. From a study of the influence of the support, the authors find that the halo disappears entirely when the illuminated portion of the film exceeds a certain limit, depending upon the index of refraction of the supporting medium, and upon its thickness. The lens also assists in the production of the halo. When the lenses are clean and well polished, it is at its minimum, but a layer of dust augments it considerably.

PHOTOGRAPHY IN AUSTRIA.

Instantaneous Pictures by Angerer—Sitting of the Photographic Society, December 2nd — Lantern Evening of the Club of Amateur Photographers.

Instantaneous Pictures by Angerer.—Among the new publications in circulation here, Victor Angerer's street scenes are really charming. They are instantaneous photographs, 19 cm. by 12·5 cm.; but they are not of that kind in which one sees that the photographer has subjected the plate to the most exquisite torture in order at last to obtain a passable picture. They are fully ripe pictures, in which the figures move with as much grace and ease as if copied for the purpose. M. Angerer, one of Vienna's best photographers, is extremely fond of mountaineering. Recently, on an excursion in Hungary, he caught his foot in a withy springe, and, in falling, so hurt his right foot that he will hardly be able, for a time, to complete his collection of instantaneous photographs. This accident took place shortly after he had favoured the Photographic Society with a description of his manner of taking these beautiful pictures. The camera consists of a simple box, 25 by 20 by 24 cm., for plates 16 by 21 cm. The objective is so placed as to be scarcely noticeable; just as little observable is the instantaneous shutter, as it is placed behind the objective. As the objective has a wide angle (made by Français, of Paris), and makes objects appear pretty sharp, even at a distance of seven metres, more distant objects being all the sharper; and as the focus of the objective is adjusted for the infinite, no special adjustment is needed when using the apparatus. If one wishes to take pictures, one inserts a dark slide in the apparatus, winds up the instantaneous shutter with a key, opens the dark slide, and is then immediately ready to begin taking. With this detective camera no view-finder is used, as with others, because it is often only a hindrance in taking street scenes. Without such an arrangement, one can better judge if the moment is suitable for exposing. In developing the pictures, an oxalate of iron developer is used, with the addition of the well-known accelerator. This consists of—

Hyposulphite of soda	1 gramme
Bromide of potassium...	6 grammes
Water	60 cms.

Of this solution take 8 c.m. to one litre of prepared oxalate solution. If it be wished to develop a plate, take three parts of oxalate solution mixed with the accelerator. This developer is to be recommended when it is a question of shortening the exposure, for it acts with double the force of the ordinary iron developer. Angerer lays it down as the first rule that the same scene should never be taken twice, as the public immediately loses its enthusiasm. As all exposures must be made holding the apparatus, which is tolerably large, in the hand, it is best to hold the camera between the chest and chin, which, naturally, cannot remain unobserved. His pictures form the most charming mirror of life, and it is striking that the groups, almost without exception, look as picturesque as if sketched by an artist.

At the beginning of December, two photographic events took place on one evening. The one was a lantern evening given by the Club of Amateur Photographers for a charitable purpose. It was held in the largest hall in Vienna, which was crowded. Thus the greatest pecuniary success was achieved. The sheet was more than 10 metres square. As the pictures were taken by the members of the Club, whose friends were among the audience, the applause was such as, otherwise, is heard only at a *dilettante* theatre. How trifling seems the imperfection of some of the slides when compared with the joy of the unfortunate people to whom the proceeds will go!

Sitting of the Photographic Society.—The other event was the sitting of the Photographic Society. A sensation was created by some enlargements in the room exhibited by Marion and Co. Particularly the technics of retouching—or rather, the suitableness of the paper for artistic retouching—was pointed out. Also the same firm's opals are a novelty here, at least as to their perfection. Red pigment pictures by Falkner, and photographs on platin paper by Thompson (pictures of children), excited enthusiasm. A little intermezzo took place concerning the rapid developer in use in Paris, and known by the name of "Cristallos." Mr. Putz declared that the musk smell that is added to it is only meant to mislead the purchaser as to its composition. Professor Eder said he had found ferrocyanide of potassium in this developer, but reserved more detailed communications for another time. The ferrocyanide developer was recommended by Jennings in 1885, on page 211 of your journal; and in another form, and in different company, excited attention.

The year 1704 was made celebrated by the battle of the books, but the year 1890 is to be remembered in the annals of photographic glory by the battle of the eosin plates. A clever amateur, Mr. Einsle, went into the Styrian Alps to photograph the glaciers. His outfit consisted of Vogel-Obernetter eosin plates, the fame of which has been so much trumpeted abroad in Germany. The result, however, was a melancholy one; cloudy edges and spots on the plates disfigured his pictures. In his first disappointment he published his sad experiences. The poor photographers had a feeling as were a thunderstorm about to burst forth. Vogel's adherents exhibited hundreds of really excellent pictures, with admirable orthochromatic effect, and of the largest size, in order to give evidence of the excellence of the Vogel-Obernetter plates.

In consequence of the eosin demonstration, nearly 300 pictures adorned the walls of the Imperial Academy of Science. Who knows what irrevocable utterances might have been made had not Professor Luckhardt, after reading Dr. Vogel's assertions and his opponent's semi-declaration of honour, moved that, for the Society, the controversy be ended? But whether the strife between such embittered foes will be continued in Siberia, your correspondent does not venture to prophesy. Certainly, in that case the duty of reporting will not fall to the lot of

STYX.

To Increase Sensitiveness. — A sensitiveness five times greater may be given to gelatino-bromide plates by steeping them in a mixture of 100 c.c. of alcohol at 80 per cent., from 1 to 2 c.c. of a solution of nitrate of silver in water (1 : 15), and 10 c.c. of ammonia. They are allowed to remain in this bath from three to five minutes, dried, and used immediately. —*Der Amateur Photograph.*

The German Language.—*The Photographisches Wochenblatt*, No. 35, of Berlin, thus comments upon our late caution to photographers about to visit the Fatherland, which has been copied in various journals at home and abroad, viz., "We rejoice ourselves that our newly article out of the 'teutschen Glashaus' also beyond the canal and the oceau, happiness excited has. He is with manifold gocose additions in English and American journals uptaken. One periodical appears entirely almost believed to have, that our fellow-laborer earnestly these propositions had made."—*The American Journal of Photography.*

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

TONING BATH FOR YELLOW-STAINED NEGATIVES—DEVELOPERS FOR DETECTIVE CAMERA NEGATIVES—URANIUM INTENSIFIER—COLOURED PHOTOGRAPHS BY TONING—READY-SENSITISED ALBUMEN PAPER—NEW TONING BATH FOR GELATINO-CHLORIDE PAPER.

Toning Bath for Yellow-Stained Gelatine Plates.—To those who use gelatino-chloride paper—more especially Liesegang's aristo paper—for printing yellow-stained negatives present simply the difficulty that the printing takes a little more time than with clear negatives, whereas they possess the advantage that with this paper they yield prints of special softness and beauty. In many cases, however, it will be desirable to remove the yellow stain, caused generally by the prolonged development with pyro or with quinol, and, in such cases, the following method, which has been suggested by a correspondent of *Der Amateur Photograph*, may prove useful. To a solution of 1,000 grammes of hyposulphite of soda in 4,000 c.c. of water, 120 grammes of sulphocyanide of ammonium and 30 grammes of pulverised alum are added, and the milky solution is allowed to stand for some days with repeated stirring; then 150 c.c. of a solution of chloride of gold (1 : 200) are added to it. After the clear liquid has been decanted from the sediment, the yellow-stained negatives are placed in it for about half-an-hour, at the end of which time they will show a beautiful blackish-violet to greyish-blue colour.

Uranium Intensifier.—Mr. L. Schrank, editor of the *Photographische Correspondenz*, recommends the following intensifier as thoroughly trustworthy, especially in the case of negatives destined for zincography, and for the platinotype process:—

Solution A.

Nitrate of uranium	7 parts
Glacial acetic acid	7 ,,
Water	280 ,,

Solution B.

Ferricyanide of potassium	7 parts
Glacial acetic acid	7 ,,
Water	280 ,,

The solutions are poured over the plate in succession. The negative treated with this intensifier acquires a brownish-red colour, which is of great covering power.

The Production of Coloured Photographs by Toning.—I have made of late some curious experiments, which, though they have nothing to do with heliochromy, have given results very similar to those pictures which I have received from M. Veress. It will be remembered that Capt. W. de W. Abney stated some time ago that a process of producing photographs in natural colours, *based upon development*, would be impossible. In reading his lucid and interesting paper, it happened to me to try if it be possible to obtain a heliochromic effect by treating a photographic print, parts of which were printed under various circumstances, by different toning baths. It is well-known that the time of printing, the temperature during the printing process, the degree of density of the negative, the composition and temperature of the toning bath, and other conditions, materially affect the resulting colour of the print. I obtained nice effects in the following manner:—The negative—a cabinet portrait of a gentleman with a black coat, light hair, and light beard—was printed as usual on albumen paper. The print, as soon as it had been removed from the frame, was well washed. Meantime, I prepared two solutions:—

A.—Chloride of gold	1 gramme
Acetate of soda	10 grammes
Water	100 c.c.
B.—Hyposulphite of soda	20 grammes
Water	100 c.c.

They were kept separately in two wide-mouthed glass bottles. Besides, I used two dishes, and a few sheets of blotting paper. After washing, the print was placed between the blotting-paper, and slightly pressed, in order to take away the superfluous water, and then placed flat on a well-cleaned glass plate. I then took a fine brush, dipped it in solution A, and passed it over the whole picture, with exception of the face and the hands of the portrait. The solution was allowed to act until a black tone was obtained, which took about half an hour; the print was then washed for ten minutes, and fixed in solution B; finally, it was washed in the usual manner. The longer the gold solution is allowed to act, the blacker will be the resulting tone. So an orange-coloured neckcloth will be obtained within one minute, a coffee-brown upper coat within five minutes, a violet vest within ten minutes, and a black coat within about half an hour. The face, the hair, and the hands obtain their corresponding colour in the hypo solution. The effect is very nice.

Ready-Sensitised Albumen Paper.—There are many formulæ for the preparation of ready-sensitised albumen paper, but the following one, which is recommended by Fr. Wilde in the *Wochenblatt*, seems to be of special trustworthiness, and deserves the attention of the practical photographer. The paper is floated for two or three minutes on a solution of—

Nitrate of silver	100 grammes
Citric acid	100 ,,
Water	1,200 c.c.
Alcohol	100 ,,

After each sheet has been sensitised, 10 c.c. of the following solution are added to the bath:—

Nitrate of silver	20 grammes
Citric acid	12 ,,
Water	200 c.c.
Alcohol	20 ,,

When removed from the bath, the paper is drawn over a glass rod, and, after draining, placed with the sensitised surface on chemically pure botting-paper. It is then covered on its back with a sheet of stout paper, and well and evenly wiped off by powerful rubbing and pressing. Finally, it is dried spontaneously in the dark. If placed between preserving paper it will keep for from six to eight weeks in summer, and for months in winter. The preserving paper consists of soft, very thick, unsized blotting-paper of white colour, which should be entirely free from wood, chemically pure, and saturated with carbonate of soda. It should be used in rolls of from five to six metres length, and kept, together with the sensitised paper, in pasteboard or tin boxes.

New Toning Bath for Gelatino-Chloride Paper.—According to the *Archiv*, G. Bani recommends the following bath:—

Well water	150 c.c.
Benzoate of soda (produced from the acid)	20 grammes
Caustic potash	0·1 gramme

To this solution is added 50 c.c. of—

Solution of brown gold chloride	1 gramme
Water	150 c.c.

The solution should be stirred, and allowed to stand for two hours. After this time the bath will have become rose-coloured, when it may be used for toning. It is said to give tones similar to those obtained with the platinum toning bath.

Literary Notices.

THE OPTICAL LANTERN. By Andrew Pringle, F.R.M.S. (*New York: The Scovill and Adams Co.*, 1890.)

THIS book, useful at all times, is particularly of value to photographers at the present season, when out-door work is nearly at a standstill. The volume gives plenty of information about the optical or magic lantern; we prefer the old name of the instrument to that on the title-page of this book. There are plenty of optical lanterns which are not used for the projection of images on to screens—railway signal lamps, for instance; also the bull's-eye carried by the friendly or unfriendly policeman.

Considerable experience in his subject is displayed by the author in the information he gives about the construction of oxy-hydrogen jets, and all the other apparatus necessary for the production of the lime-light. More might have been said in the work about the employment of oil lights of different kinds, and the amount of illumination of the screen they will give under stated conditions. Such matters are treated with brevity in the book, yet it is probable that the majority of persons who buy magic lanterns do so for use in their own homes, and avoid the use of compressed gases, the manipulation of which it is not desirable to leave to unskilled members of the home circle.

Mr. Pringle speaks as follows about a form of lantern condenser recommended by Mr. John Traill Taylor:—

This form consists, as will be seen from figure 7, of a plano-convex or slightly meniscated lens in close proximity to a double convex. Mr. Taylor then rightly points out the loss of light certain to arise with this form of condenser unless the focus be long, which will entail loss of intensity, and he proceeds with his usual ingenuity to suggest the interposition of a third

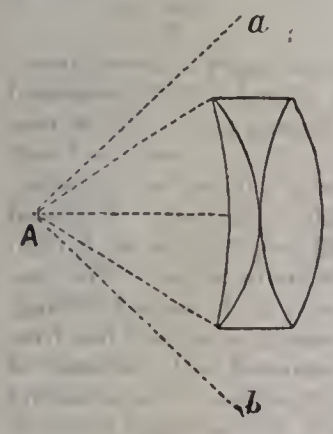

Fig. 7.

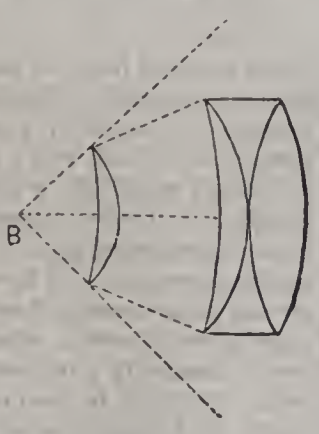

Fig. 8.

lens of plano-convex or menisens form between the light and the doublet combiuation previously representing the entire condenser. The figures are Mr. Taylor's, and almost explain themselves.

In A, *a b* represent rays that are lost, while in B (fig. 8) they are refracted and utilised by the addition of the third and smallest lens. Mr. Taylor therefore concludes in favour of triple condensers.

Our experience is confined to the form first figured (fig. 7) and the part of Mr. Taylor's figure A; of these we prefer the two plano-convex glasses, fig. 1.

The amount of light gained by Mr. Taylor's plan is so great that the advantage gained thereby deserves much stronger emphasis than it has received in Mr. Pringle's book. By the use of the third lens it is true that two additional reflecting surfaces are introduced, causing a slight loss of light so far as the illumination of the screen is concerned, but this is but giving a sprat to catch a whale. In fig. 8, if the area of the ring (otherwise lost) of light be measured which the small lens throws into the larger lenses, and then the superficial area of the circle of light which the larger lenses will collect by themselves be measured, probably it will be found that the use of the small lens causes the amount of light collected by the condenser to be nearly doubled. Possibly, however, fig. 8 is drawn solely for the purpose of illustrating the principle, and that in the practical working the paths of the rays would not form exactly the same angles as those represented in the diagrams. Yet, in any case, the gain in light is great, and why Mr. Pringle should go without the additional light collected by the third lens is a mystery requiring explanation. In fig. 7 the concave surface of the lens nearest to the jet enables it to collect more light than would a plane surface, since near the edge of the plano-convex lens the rays fall more nearly at a grazing angle, consequently more of them are reflected back into the lantern, the diameters of the condensers being the same in both cases.

BOOK ILLUSTRATION.—A correspondent of the *Gutenberg Journal* has drawn attention to the large and bewildering number of appellations under which different processes employed for the illustration of books are now designated. There are:—Tissiérography, zincography, paniconography (or gillottage, after the name of its inventor, Gillot), photogravure, photo-zincography, heliogravure, heliography, heliotype, helioehromotype, hélioglyptie, phototype, hélioplanography, photoglyptie, phototypography, photochromo, pantotype, Woodburytype, panotype, albertype, typochrome, collotype, antotype, diaphanotype, chrysogypy, gelatinography, téténotype, leneography, and chaotype.

PHOTOGRAPHING A WILD BEAR.—Henry H. Ragan, the lecturer, was out in the Yosemite not long ago looking up material. Like the modern traveller, he carried his camera wherever he went. He concluded, records the Chicago *Tribune*, that he would like to photograph a wild bear. This wish was communicated to a hotel clerk, who, like his more easterly brother, signified his willingness to furnish the bear. *Oberon*, king of the fairies in "A Midsummer Night's Dream," boasted that he knew a bank. The Yosemite hotel man, with equal felicity, said that he knew a bear. It came down from the fastnesses at certain hours and approached civilisation, gazed at it, and returned to its cave. Since the Government allows no hunting of game in National Park, Bruin roamed unmolested. But how to get the bear in position for a snap-shot from the camera was the question. The clerk solved this. At a certain hour the clerk took a large portion of meat from the cook's box and left it at a point at which the bear was frequently seen. Ragan followed with his camera. In due time the bear came down from its retreat. The clerk was a safe distance away when the bear appeared, but Ragan stood his ground. The bear stood its ground until the odour of the meat was wafted its way, when it made for the luncheon, picked it up greedily, and then, as if grateful for the feast, reared on its haunches and remained in that attitude for a minute, a sufficient time for a "sitting." A moment later the bear turned in another position, as if trying to accommodate the artist, and the latter obtained another view. The bear then rolled away in the direction whence it came. The artist, on returning, found the hotel clerk and a few guests secreted near his position, heavily armed, ready for a fray if the occasion had arisen.

PHOTOGRAPHY IN THE UNITED STATES.

BY CHARLES S. PATTERSON, M.B.

A National Association of Amateur Photographers—The New York Camera Club—"Stalls" for Developing Rooms—Photo-Micrography—The "Enoch Arden" Prints.

The news of the week is mainly concerning the convention which is to be held on Thursday, December 4th, at the rooms of the Society of Amateur Photographers of New York, at 113, West 38th Street. Twenty-eight delegates from fifteen of the principal photographic clubs of the United States will meet to consider a number of propositions, the principal of which is the advisability of forming a National League of Amateur Photographers. I enclose the prospectus.

I was yesterday shown over the rooms of the New York Camera Club, also those of the Society of Amateur Photographers. These, indeed, put to the blush our moderate ideas. Both premises are fitted throughout with the Swan-Edison incandescent light, and have magnificent brush lights for bromide enlargement.

Each worker in the dark room has a stall to himself, having a passage-way common to all running behind him. There are no doors to this passage, the light being excluded by the entrance, making two turns. The advantages of this arrangement are cool dark rooms, perfect ventilation, and thorough control over the light without incommoding any other worker.

I was shown drying rooms and enlarging rooms—daylight and electric—also rooms for isochromatising and storing plates, and for printing and mounting both paper and lantern slides. In fact, to know what it is to work under perfect conditions, one must enjoy the hospitality of an American photographic club.

While in the Camera Club, I had the pleasure of meeting Dr. Henry G. Piffard, one of the veteran photo-micrographers of the United States. His first photo-micrographic work was done in 1874, to illustrate his well-known work on "Diseases of the Skin." The plates were produced by Bierstadt by the gelatine line process. The source of illumination was a slowly moving heliostat. Now he has replaced his heliostat by a 100 candle-power incandescent lamp, a change he had not been able to make previously, owing to his inability to procure a light of that power. He is inclined to pooh-pooh our photo-micrographic work, and, indeed, for detail and quality his electric-lit negatives will compare very favourably with the best English productions. I have in my possession prints which I shall be delighted to forward for your inspection. Dr. Piffard has also been doing some beautiful microscopic photography of subjects lit by the magnesium flash-light. He uses the form which he invented, and with which his name is so intimately associated. He is certainly master of this method of illumination—detail, light, and shade being all harmoniously blended, and the usual staring character of the flash-lit subject is conspicuous by its absence.

En passant, I may say that the "Enoch Arden" pictures which took the grand prize at the Washington Convention this year are on view at the rooms of the Society of Amateur Photographers. They are three well-printed albumenised silver pictures to illustrate "Enoch Arden." In silver they look common and poor, but would, I think, be more than passable if printed in platinum or sepia. I hope to be able next month to forward full particulars of the fourth annual combined Exhibition of the Boston Camera Club and the Photographic Societies of Philadelphia and New York. The prospectus is now out. It will open on May 28th, 1891.

New York, December 2nd, 1890.

THE NATIONAL ASSOCIATION OF AMERICAN AMATEUR PHOTOGRAPHERS.

The following is the circular mentioned by Dr. Patterson, as having been sent to all the amateur photographic societies in the United States of America, and which seems likely to induce practical results:—

Sir,—The Syracuse Camera Club, by resolution dated August 8th, 1890, authorised the issue of a brief address to the amateur photographic societies and clubs of America, calling their attention to the desirability of a national organisation of those interested in photography, either practically or in its purely scientific relations. No farther reference was made to the special objects of such a national association, but the circular was thrown out as a germ thought, around which might crystallise the suggestions, objections, or assents of the organisations to which it was addressed. A large number of clubs and societies has responded favourably to this address.

The Syracuse Camera Club authorises the publication of the following:—

It may be well in this call for a meeting to effect the preliminary organisation which this numerous favourable response authorises, to herein enumerate some of the purposes that fall naturally within the scope of such a convention, as suggested in the many answers to the circular.

1st. The stimulus to study, invention, theoretical and technical knowledge that result from personal touch with those devoted to the many-sided science called photography, and to dignify a beautiful art which is in danger of being belittled by aimless practice.

2nd. That those objects are best served by an annual conference, preserving its organisation from year to year, and governed by a Council or Executive Board with its officers elected annually or otherwise, as may be determined at the preliminary meeting.

3rd. In connection therewith annual exhibitions of photographs, photographic appliances, and apparatus, and thus secure excellence of work and inventive activity.

4th. To promote the application of photography to the sciences, arts, and professions, among which we may mention astronomy, mineralogy, geology, botany, biology, medicine, pathology, microscopy, surveying and mechanical engineering, geographical and historical photography, medico-legal photography, submarine and spectroscopic photography.

5th. To preserve the scientific papers and inventions presented at the meetings in an annual volume of transactions, and thereby encourage men to prepare papers upon chemical, optical, and other collateral sciences embraced in the field of photography.

6th. To secure arrangements with foreign Custom Houses, through the Government, for the safe transmission of undeveloped plates and apparatus belonging to members of the national organisation, and to arrange with national, State, and local authorities the privilege to photograph in public parks, buildings, and on public occasions under the protection of his badge or membership card.

7th. To secure conveniently arranged dark rooms in all the hotels throughout the country, and special rates for the members of the league; also the preservation of a photographic directory of each locality, relating to the objects of historical and scenic interest, and the best time of day to photograph.

8th. To secure from the general government the free interchange of negatives and slides between the various club societies and members, represented in the national league or conference, and foreign photographers or societies.

This is only a partial enumeration of the important subjects that await the action of such an annual conference, and to

establish which your co-operation is earnestly solicited. The board of directors of the Society of Amateur Photographers of New York, at a meeting held on the 23rd of September, kindly granted the request of the Syracuse Camera Club for the use of the Society's rooms for a meeting of delegates to perfect the preliminary organisation.

You are, therefore, invited to send one or more delegates from your organisation to meet at the rooms of the Society in New York City, No. 113, West 38th Street, on the 4th day of December, 1890, at 10.30 a.m. An answer as early as convenient is requested, together with the names of the members who may be delegated to attend. Wallace Dickson, *Secretary.*

Box 173, *Syracuse, New York.*

SOME OF THE TENDENCIES IN PHOTOGRAPHIC ART.*

BY PHILIP H. NEWMAN.

To observe and comment on some of the present tendencies in photographic art, one is of necessity bound to notice its exhibitions, and although opinions may be divided as to the merits or demerits of the Photographic Society of Great Britain, and however one may be disposed to quarrel now and then over the justice of its awards in particular instances, or to question the advisability of its making any awards at all, one must, I think, allow, if indeed it does not almost go without saying, the exhibition in Pall Mall is usually fairly representative. That of this year being no exception to the general rule, I shall make no apology for drawing your attention to it as the basis of the critical remarks I have the honour to address to you this evening; premising, however, that criticism from my point of view is not necessarily fault finding, and where fault must be found, it is in no carping spirit, but after full conviction, and for that which I conceive to be of the very highest importance, viz., the true interest of art.

Now, at first sight, it may appear a very easy thing to make remarks on a photographic or any other exhibition; you have simply to go and look at the works, see which you like best, stamp them with your approval, slate all the others, and there you are. Of course one has to give some reason for one's likes and dislikes, but if this is wrapped up enough in technical phrases, bristling with plenty of the art-jargon current, one may sufficiently mystify an audience, and one's voice be none the less divinely authoritative because it comes from a cloud. But as I do not like this sort of thing at any time, and have too much respect and sympathy with my audience, in the present case, to veil my own ignorance by relying upon theirs, I grapple with the fact that it is not such a very easy thing after all to give a clear and useful opinion on the great variety of works comprised in the recent show in Pall Mall.

In the first place, the photographic journals have already had much to say on the subject, often dealing with the works exhibited seriatim, and pretty exhaustively; how, then, am I to drag you over this ground again, and tell you that Mr. So-and-So "surpasses himself in the true æsthetic way,"—whatever that may mean—or that Mr. Somebody-else is "very much befogged," and ought not to have been hung at all? Now, however necessary this sort of criticism may be thought to be in the management of a photographic journal, it cannot be said to be of much service to the amateur, so that if we are to talk profitably for an hour on the exhibition, it must be on other lines than these.

Now I am not a photographer, scarcely an amateur, but very much an outsider, and I think it not unlikely that your sagacious president, when he favoured me with your invitation to read a paper, thought there might be some hope in this; at any rate, it gives me hope that in looking at things quite in an outside sort of way, I may be able to point out more in the landscape of general interest, than if I groped for it in the dark room or through the camera. By the way, what an awful thing it seems to have to put one's head in a bag to look for the right combination of art and nature to make a successful picture. Woe unto those who have continually to do so, and cannot see a picture in the camera of their eye before they focus it in that of wood and brass. I fancy sometimes, when I talk to some photographers, or look upon their works, that they have never got their heads out of the bag from the first moment of their focussing career; art and nature both being to them thenceforth but darksome ways illuminated only by weird and flickering lights, leading them to the valley of the shadow of artistic death. If not so, how is it that the walls of our exhibitions are often smothered by lines of frames enclosing befogged inanities representing nothing in nature or art truly; perpetrations of people who are not, and never can be, either photographers or artists; or if they should happen to excel in one direction, are so blinded that they persist in thinking they must necessarily excel in another; obstinately exhibiting caricatures of portraits, when their *forte* is landscape; or whom, though their portraits may be tolerable, maintain the idea—as shown in their works—that aerial perspective in general landscape justifies indistinctness in every plane? Let us get our heads out of the bag, at any rate, and look at this recent exhibition in Pall Mall in the light of clear and wholesome day if possible, and without a sniff of the dark-room about us; and let us see what are our impressions, or depressions, as to questions of art.

Firstly, it seems to me that this exhibition was an epoch-making one, because it emphasised new departures in several directions, which the next exhibition must advance, or stultify itself as to its present leading. These new departures are principally in reference to printing processes. The old albumen silver print is becoming rapidly a thing of the past; it lingers here and there, unmedalled, on the walls; and it may not be prophesying too much to say that in the next exhibition it will be extinct, and that, for better or for worse, platinum and bromide will hold its place. Another new departure that undoubtedly will be more greatly in evidence in the next exhibition than even in this, is rough surfaced paper, as used in most of the new processes. Again, the carbon process seems not only to hold its own, but is gaining in interest as affording opportunity for a genuinely artistic alliance with hand work, as evidenced in some prints showing dry point finishing. There are on the walls many excellent examples of photo-etching and photo-gravure, but I only allude to them in passing; it would take far too long to enter into their merits and progress particularly, or to more than mention the highly interesting diazotype printing, based on the application to the art of the new coal-tar colour, primuline.

While speaking of photo-gravure, it must be remarked as subject of regret that the processes whereby it is endeavoured to produce engraved blocks for stereotyping, or to be used with ordinary letter-press type, are in a most unsatisfactory state—at least, for all commercial

* Read before the members of the West Kent Amateur Photographic Society.

purposes where an artistic result is desired ; the monotony of tone, or mere smudginess, being in most cases very disappointing. A great field is open here for photographers to invent a really artistic process to serve the purposes of the ordinary wood blocks. I may be forgiven for dwelling upon this if it does not arise naturally from the exhibition so much as from my own personal feelings and experience in regard to a series of illustrations "processed" from very tolerable negatives of my own, the prints being far, however, from all one could desire.

The exhibits of photo-micrography show, if anything, an advance ; in their direction, the painstaking labour of those who devote themselves to this less picturesque portion of the art is evidently bearing most desirable fruit in the general application of their results to purposes of study. If your worthy President does not make what is generally known as an artistic exhibit with his bacilli and dry bones, it must be allowed that he has succeeded in getting such a range of tones in the printing of these anatomical illustrations that, in an artistic point of view, some of the landscapists may envy him.

(To be continued.)

A PHOTOGRAPHIC EXHIBITION AT LOUTH.

IN order to give a stimulus to the art of photography amongst the amateurs of the town, the members of the Louth (Lincolnshire) and District Photographic Society decided to have an exhibition of their work in the Council Chamber, and this was held last week on Thursday afternoon and evening. In the afternoon admission was by ticket, and the leading gentry of the town and neighbourhood were present. The Mayor (Ald. James Fowler), who was accompanied by the Mayoress, opened the exhibition. The exhibits of the Louth members were supplemented by some from Mr. Gale, of London, and Mr. Armitage, of Nottingham. Mrs. Clarke showed illustrations of the application of photography to silk for domestic decoration, and some specimens of wall pockets and hand screens made of photographs on silk. Amongst the general exhibits of Mr. and Mrs. S. F. Clarke there were frames of lantern slides for which Mr. and Mrs. Clarke have been awarded several silver and bronze medals, micro-photographs which were awarded a diploma at Vienna, a certificate at the Crystal Palace International Exhibition, and two bronze medals, a picture entitled "What love hangs by," which received a medal at London, and the first prize at a Belfast competition, a picture entitled "Fortune Telling," awarded first prize at Belfast. In the group was a pretty picture entitled

"There is nothing half so sweet in life
As love's young dream."

This is, Mr. Clarke considers, his best picture, and although it did not take a prize, it commanded great attention. Mr. Clarence James is a large exhibitor, and amongst his specimens were a number of portraits taken on rough drawing paper. In his group were three landscape views which were awarded a silver medal at Kidderminster last March, a snow scene, awarded a bronze medal at London in 1888, and a portrait entitled "His First Model," awarded two medals a fortnight ago at Tunbridge Wells. A series of excellent pictures was sent by Mr. Armitage, of Nottingham ; a frost scene was admired by all present. Captain Ranshaw showed some photographs taken thirty years ago. The pictures sent by Mr. Gale, of London, were very handsome ; "A Moonlight Effect" and "A Misty Afternoon" were especially charming. Amongst the other exhibitors were the Rev. C. W. Whistler, of Theddlethorpe (president of the Society), the Rev. H. W. Everingham, of Trusthorpe, Mr. Alfred Plaskett, Mr. John W. East, the Rev. J. M. Coates, Mr. W. P. Willey, Mr. Henri Perron, Geneva, and formerly at the Louth Grammar School, and Mr. G. H. Formau, the latter three of whom showed the productions of their "first year's work." The photographs consisted of bromides, platinotypes, and a few silver prints.

The Mayor said that it gave him great pleasure to open this exhibition of amateur photography. He thought he was right in saying that the Society in Louth was the only one in existence in the whole county of Lincoln, and this was the first exhibition of the Louth Society. Over two hundred pictures were exhibited by the members of the Society, some of which had been shown for competition and won nineteen awards. After looking round at the exhibits, he thought that there was one word which might have been left out of the circular, and that was the word "amateur," for on carefully looking at their views, which were of such high character and good quality, the public might conclude they had before them the work of professionals rather than of amateurs. When they thought of what photography is, and what its namesake was fifty years ago, they could see what great strides had been made in the art. The Mayor then spoke of the advance in the science of photography of late years, and mentioned a picture, a frost scene, Mr. Armitage's collection, which, he thought, was one of the most beautiful photographs he had seen. There were many of local interest, which brought before them small parts of the neighbourhood, with which many people were unacquainted. People at a distance were apt to suppose Lincolnshire to be one flat morass, and that nothing good could come out of it, but on looking round he thought they had convincing proof that there are places of beauty and interest in the county near Louth. He hoped that the exhibition would not be the last ; he also hoped that it might set other towns in the county a little on fire for such a purpose, and that they might form local associations and have exhibitions. The Mayor picked up a picture from Mr. C. James' collection, and pointed out to all present how a picture could be made from a mere nothing ; the view was simply a disused brick pit with a marvellous sky.

Afternoon tea was served between the hours of four and five o'clock by Mrs. S. F. Clarke.

MIXED QUINOL HYDROQUINONE DEVELOPER.—H. Haberlandt recommends—

Sodium sulphite	... ...	100 parts
Eikonogen	... ...	16 ,,
Hydroquinone	... ...	4 ,,
Water	... ...	1,000 ,,
Potassium carbonate	... ...	40 ,,

THE LIGHT OF THE AURORA.—Professors Liveing and Dewar, in a paper recently read before the Royal Society, show that fine dust suspended in gas does not become luminous with its characteristic spectrum in an electric discharge, and they conclude that if the spectrum of the aurora is due to adventitious matter from planetary space, rather than to the ordinary constituents of the atmosphere, such matter must be brought into the gaseous state before it can become luminous in an electric discharge.

PHOTOGRAPHY IN COLOURS.—Dr. Miethe gives an account of the experiments he has made in photography in natural colours. He used collodio-chloride of silver containing an excess of nitrate. He exposed this collodion to a strong light for several hours, agitating it from time to time ; a brown precipitate is formed. After having decanted the clear portion, he coated with it some paper which rather rapidly reproduced the colours. Fixing is done with the aid of a solution of chloride of magnesium to which three per cent. of alum has been added. Unfortunately, at the end of a short time the colours fade. To obtain good results it is necessary to intercept the ultra-violet rays by a special screen. Dr. Miethe makes use of a plate coated with :—

Gelatine	... ...	2 grammes
Glycerine	... ...	2 ,,
Water	... ...	25 c.c.
Heseuline of Schuchardt	... ...	0·05 gramme.

By combining this plate with another coated with the same preparation, but containing, instead of the heseuline, 0·02 grammes of fluorescein, the absorption of the ultra-violet rays is almost complete. It is better to place these two plates with the film sides in juxtaposition.—*Photo. Wochen.*

SOME HINTS ABOUT NEGATIVES.

BY JULIUS F. SACHSE.

With the present month the out-door season of the amateur and tourist photographer draws to a close. The days have again become short, the trees leafless, the hill-sides bleak, and the romantic valleys cheerless, and there is little to tempt any but the pronounced enthusiast to wander forth with his tripod and camera. The great proportion of the outfits will be laid aside and neglected, with, perhaps, an occasional exception when they are brought forth from the shelf and set up for a few flash-light effects, after which they are set back until the zodiacal Taurus once more reigns supreme. Of course this does not allude to the photographic student or enthusiast, for to him the winter season brings the most interesting work of the year, viz., lantern slides, together with the opportunity for experiment and research in every department of the photographic art.

Strange as it may seem, the most neglected branch of amateur photography of the present day is the care and use of the negatives after we have them. The tourist, as well as the general amateur, during the season, exposes plate after plate, develops and fixes them, examines them, is pleased or dissatisfied with the results, as the case may be, after which the negative is put on the shelf along with many others in some out-of-the-way closet, box, or drawer, and the creator of the "latent image" soon forgets all about them, his mind becoming engrossed with new and different subjects, which are in turn destined to fall into the same groove. It is true that, occasionally, a few prints are made from a few of the negatives, but this represents but a small proportion of the whole number of the negatives taken. The great majority are soon forgotten, and at the next semi-annual house-cleaning find their way into the ash-bin.

Independently, it would be an interesting fact to know what proportion of the hand-camerists' "button pressures" ever see the light of day in a printing-frame; we here allude to the perfect negatives, not the failures. But, to return to our subject, we would suggest to all amateur and photographic tourists, now that the long evenings are at hand, to gather all of their photographic results, and put their negatives in envelopes, such as made for the purpose, classify and number them, and, during the coming months, have at least one print made from each and every negative, good, bad, or indifferent; have these mounted on a plain, white card, leaving at least a two-inch margin around the print—this will give ample room for notes or references for the future. These notes should give the exposure, stop, development, and lens, also the date, and, if a view or building, where located, and anything of interest connected with the special view. If the picture contains portraits or figures, add the names and the occasion. This work will be found to be an interesting occupation; in fact, the tourist will go over his trip once more, while, photographically, the comparison of the various prints will prove an instructive lecture for the future.

The prints may then be sorted out according to the subject, and if not bound into a volume can be placed in pasteboard boxes the size of the mounts, a separate box being used for each variety of subject; this is probably the best plan where there are many pictures of different subjects. Where the factor of expense becomes an item, and the amateur cannot do his own printing, we refer him to the excellent paper on "Artistic Blue-Prints" from an esteemed contemporary, which is re-published in the present *Journal*. But, no matter which plan you adopt, get the prints, and preserve and classify your negatives; you never know when any special negative will become of value, and, unless you employ a system, it is just then that you cannot find the one you want.

We were never more impressed with this necessity of a proper classification than on an occasion early last spring. We applied to a prominent member of our photographic society for a negative of a historic subject, which was wanted for an illustration. He had the negative, and wanted to loan it to us, but could not find it. He was certain that he had it; but there, it was somewhere among hundreds of others, all piled helter-skelter in a closet, one on top of the other, with a piece of newspaper between them; many were ruined, some broken, others spoiled by the dampness of wall. In reality, the work of this amateur, which represented years of labour and hundreds of dollars, was really valueless for the want of proper care and classification of the negatives after he had made them.

In our own practice, we put each negative in an envelope, and stand them on end in a strong pasteboard box made for the purpose, and which holds fifty plates. We number the box on the outside—say, 800-849, 850-899, &c. We then index the plates in a book under the proper subject, and any plate in our collection can be found in half a minute, and they are safe from dampness, dust, and interference. Where many subjects are treated, it will be found to be an advantage to reserve a different box for a special subject. Quoting again from our own practice, say the 100's are historic landmarks; 200's, revolutionary subjects; 300's, colonial churches; 800's, experiments with growing plants; 900's, microscopical subjects, &c.

In conclusion, we will say that, if we can afford to make negatives, we should also afford, or be willing, to take care of them, bearing in mind that, with the various changes which fleeting time brings, we never know how soon some negative in our collection may be in demand, and amply repay for the little extra trouble it takes to preserve and classify them.—*American Journal of Photography.*

THE LONDON CHAMBER OF COMMERCE.

A largely attended meeting of the representatives of the various trades interested in American copyright was held on December 11th, at the offices of the London Chamber of Commerce, Botolph House, Eastcheap; Mr. R. K. Causton, M.P., presided. The meeting proceeded to consider what action should be taken in connection with the American Copyright Bill. After discussion, in which Messrs. Edwin Ashdown, James Bowdon (Ward, Lock, and Co.), W. C. Knight Clowes (Wm. Clowes and Sons, Limited), C. J. Drummond (Secretary of the London Society of Compositors), R. W. Routledge (George Routledge and Sons, Limited), A. C. Trench (Kegan Paul, Trench, and Co.), and others took part, it was unanimously agreed that a committee, representative of all interests concerned, be appointed to consider the whole question and report to a future meeting as to what steps they would propose should be taken. It was also suggested that the London Chamber should communicate again with the Board of Trade on the subject.

A petition in favour of the appointment of a Royal Commission to inquire into the desirability of introducing the decimal system of currency, weights, and measures into this country is being circulated by the Decimal Association. Copies of the petition lie for signature at the London Chamber of Commerce, Botolph House; at the office of Mr. J. Emerson Dowson, C.E., 3, Great Queen Street, Westminster; and at the offices of Messrs. Cridland and Nell, 27, Bedford Row, London.

Notes.

When eikonogen first came into market, it appeared in a powdery form and of a chocolate colour, reminding one speaker at a public meeting of "road sweepings"; after a time it became purchasable in nearly white crystals. Dr. Elliott recently informed the New York Society of Photographic Amateurs that he had learnt from German sources that the transformation had been effected by making a saturated solution of the crude eikonogen in hot water, then adding some tartaric acid; the latter seizes the soda of the betanaphtholsulphonate of soda, and sets the acid of the eikonogen free in a flocculent form. The flocculi settle, and the liquid is poured off; the former are then dissolved in sulphite of soda, and from the solution the present eikonogen crystals of commerce are formed. A French authority says that the present powdered and "permanent" variety of eikonogen is made by grinding in with the changeable eikonogen a small proportion of metabisulphite of potash: too large a proportion of the latter salt will slow the developer. The statements are all based upon various assertions printed in foreign journals, and the hints may, perhaps, be useful to those who feel inclined to take up the work of verification.

The duty to be paid at the American Custom House for imported albumenised and sensitised papers has, under recent legislation, been raised from fifteen per cent. to thirty-five per cent., and great is the outcry among American professional photographers. Most of the albumenised paper used in the United States is sent there from Dresden, nearly all home attempts at competition with it having failed. The protective legislation is estimated by Messrs. Anthony & Co., of New York, to impose a tax upon American professional photographers of about one hundred thousand dollars a year.

The method recently employed by Dr. Scholbeuf, of Antwerp, of showing lantern pictures stereoscopically upon the screen, is attracting much attention on the Continent, the advantage of the method being that somewhat complicated synchronous mechanical contrivances are not necessary to produce the effect, and that each observer has but to look through two pieces of glass of different colours, one of which transmits most of the coloured light from one of the pictures on the screen, and the other most of the light from the second picture. Carefully selected green and red glasses are used to give the effect of stereoscopic relief. M. Davanne has made a communication to the Paris Society for the Encouragement of Industry, in which he says that the invention is not new, and that in Poggendorf's Annals for 1853 Herr Rollman, a German physician, describes an experiment of the same kind.

There are some curious photographic studios in the world. A popular photographer, Cook Ely, of Oshkosh, Wisconsin, has one so large that it will accommodate a dancing party of sixty, and a musical band. Says the *Oshkosh Times*:—"When the guests had all arrived, they crossed the yard to the studio. The spacious skylight room, with its fine, hard wood floor, capable of accommodating five sets at once, was illuminated by dozens of Chinese lanterns suspended overhead, the effect being very pretty. The Arions, being stationed at one end of the room, with music that always inspires, soon enticed the merry guests to float in the dreamy waltz, or join in the airy steps of 'McGinty.' The floral decorations in the studio parlour were arranged by Nelson, the grate and mantel being banked with potted chrysanthemums, and a variety of foliage and blossoming plants."

The cheaper production of aluminium is, from a photographic point of view, of so much importance, that we are glad to record any advance which promises progress in that direction. The metal has so many advantages that it may be regarded as the one which will in the future be more used by manufacturers of photographic apparatus than any other. Its high price is at present the sole bar to its extended employment, but of late years the cost of production has been reduced enormously, and we now learn that in the near future the metal will be obtainable at a price less than that of copper.

Many reports to the same effect have before been circulated, but this time the information bears the authority of a well-known name, so that we may have some confidence in it. Mr. E. H. Cowles is one of the directors of the Cowles Electric, Smelting, and Aluminium Company, of New York, and he therefore is able to speak with authority. He is reported in the *New York Times* to have discovered a totally new process for the extraction of the white metal from common clay—a process which, he says, is "ridiculously simple in operation, and almost theoretically perfect." The extraction of the metal from the clay is effected without the use of the electric furnace, and alterations are being made at the Company's works to produce it on a large scale. It is also said that capitalists in New York are preparing to build immense works for the production of the metal by this simplified process, and that one of these establishments will probably be at Niagara Falls, where about 12,000 horse power will be required for its operations.

It seems a pity that photographs do not, like rare etchings and engravings, increase in value with age. Were this the case, some collectors would be able to command a small fortune. But there is no reason why, when permanent prints are the rule instead of the exception, that photographs should not become more valuable as they get older. The chief obstacle would seem to lie in the difficulty of ascertaining whether the original negative is still in existence, for, if it is, of course the possibility of unlimited reproduction must

prevent any great value attaching to a single positive. In one or two London shops photographs of actors and actresses of the last generation are on sale; but, seeing that they only realise sixpence each, we cannot say that any great value is attached to them. They are, however, printed on the ordinary albumenised paper, and show the defects usually exhibited by prints due to that process at the end of a certain—or, rather, uncertain—period of time.

The Parisian paper *l'Illustration* lately contained a number of pictures reproduced from photographs of Dr. Koch, his laboratory, and enlargements from microscopic preparations of those bacilli with which his name is associated. The reproductions are remarkably well done, and place before the public pictures of undoubted accuracy illustrative of a matter about which the most extraordinary interest centres. We learn from the same source that Dr. Koch employs the camera largely in his work, taking photographs of his cases from day to day in order to show the gradual process of healing under his tuberculosis cure.

There is no knowing what photographic treasures the amateur may not pick up in his walks abroad. A Lisbon photographer has just presented to the *Societé Francaise de la Photographie* an enlargement of a photograph of a specimen of the marsouin, a singular fish, remarkable for being able to travel on the surface of the sea. The photograph was taken by one of the first detective cameras made by Goldmann, of Vienna, and had no range-finder. *Apropos* of unexpected photographic "finds," if any amateur photographer had his camera with him on Sunday night at a quarter to ten, he would have had an opportunity of securing photographic evidence of a very remarkable meteor which was visible in London. This meteor shot through the eastern portion of the sky, and at the end of its journey gave out an immense volume of light equal to that produced by a flash of lightning, but of a much paler colour. We have not seen any mention made of this phenomenon having been seen in London, although it appears to have been witnessed at Ramsgate, where, says the *Globe*, the whole town was illuminated, and therefore all the more reason to hope that a picture of it has been secured. Though, of necessity, occupying but a very brief period, there was yet time for a nimble photographer to have taken a snap-shot at it.

The activity shown all over the world in regard to astral-photography is most encouraging. The latest addition to the list of first-class observatories is that which is to be built in Catania, on the Mountain Consueno, near Bagheria. Several years ago an observatory was built on Mount Etna at a height of 3,000 metres, and this observatory is to be combined, so far as the work is concerned, with the new one. This new observatory is intended chiefly for the study of celestial photography, for meteorology, and for seismology. In the garden adjoining will be placed an instrument specially devoted to the photographing of the stellar spectra. With these appliances the new observatory will take its part in the international scheme of preparing photographic charts of the skies. The organisation seems to be of the most complete character, as, in addition to the studies already mentioned, there will be an apparatus by Dr. Huggins for photographing of the solar corona. Prof. Riccò has been appointed regular Professor of Astronomical Physics in the University of Catania, and Director of the two observatories. He is a member of the international committee for photographing the stars.

Mrs. Langtry finds sitting for her photograph more tiring than playing as Cleopatra. For her sixty photographs taken by Mr. Van der Weyde she sat four hours a day for three days. It seems a small thing to sit for one's portrait, but, somehow, it takes a good deal out of one. The effort of concentrating one's self upon nothing at all is unpleasant in the first instance, and becomes positively irksome as time goes on. Some patent has yet to be devised which, while keeping the sitter perfectly still, will yet afford sufficient amusement to sustain the pleasant expression which is so desirable. We imagine, however, that in Mrs. Langtry's case the pictures consisted of costume portraits, and required specific attitudes. Naturally, this would add to the arduous nature of the sitting.

Luke Sharp, of the *Detroit Free Press*, is nothing if not photographic. His Christmas story, which divides with Mr. Rudyard Kipling's "Badalia" the special number, has photography for its basis. To put the matter briefly, a gentleman offends a lady by taking her photograph, as she supposes. She insists upon it being destroyed, and he calmly refuses. Later on, as the plot is unravelled, and as the former enemies grow to be friends, he explains that the photograph which she saw him taking did not contain her portrait at all, although the camera was pointed towards her. The scene of the adventure is in the neighbourhood of the Niagara Falls, and he further explains that it was a picture of the Falls which he was taking, and that the exposure necessary to make a good negative of the Falls was of such a short duration that her figure, being dark, would not appear at all.

"But," objects the lady, "I have seen photographs of people with the Falls as a background." "Yes," replies the gentleman, in effect; "but such pictures are made up from two negatives. People are fond of being photographed standing with the Falls behind them, and they imagine that the picture which they buy is that which was taken; but, as a matter of fact, the photograph of a person is printed on to a photograph taken previously of the Falls, simply because the exposure of the first must be at least ten times that of the second." Luke Sharp's story is, perhaps, not the most successful of his efforts; but it serves to show how useful photography can be when an original plot is wanted.

PRESIDENTIAL ADDRESS TO THE GLASGOW PHOTOGRAPHIC ASSOCIATION.*

BY WILLIAM LANG, JUN., F.C.S.

I DO not know that anything very startling has been brought forward during the six months which form our recess. Perhaps the primuline process may be cited as the most original contribution to photography during that period. As we had at our meeting last month specimens of the colours produced by this method of light printing, I need not enlarge on the subject. Colour photography is always cropping up now and again. The most recent contributor to this vexed question was an Hungarian, Herr Verescz, but experts who have seen the results assert that no real advance has been made on what was done many years ago by Becquerel, Nièpce de St. Victor, and others.

Hand-camera work has really been the principal rage during the past season. I fancy it must have been a good time for the plate maker. Plates have been spoiled indiscriminately, and the amateur has fired away at all "sorts and conditions" of subjects, whether they happened to be sufficiently lighted or not. We have heard a good deal of the part played by the detective camera in the politics of Ireland; how that a picture was secured in open court of one of the witnesses under the very nose, so to speak, of the presiding magistrate. I have here for your inspection some enlargements of Kodak pictures illustrative of shadowing. I am not sure but that the indiscriminate use of this handy instrument (I see that I have perpetrated a joke without meaning it) may lead to mischief. A picture in the periodical *Pick-me-up*, of November 8th, will bring this home better to you than anything else. The letterpress going with the picture is as follows:—"From a lady's letter—'Yes, dear, there was only one thing that spoiled my trip in Scotland, and that was Nellie's meanness. Fancy, while I was making an innocent inquiry of one of the guards at Holyrood, she actually 'mapped' me off with that horrid demon camera of hers, and sent the picture to Bob, and you can't think how disagreeable he has been ever since. Nellie and I don't speak now.'"

I have the picture in question with me, which can be studied afterwards.

Photographing is entering more and more into the everyday occurrences of our ordinary life. Take any of the prominent illustrated papers, and a good percentage of the pictures shown will be found to be produced by some of the photo-block processes. I was very much impressed with an exhibit in the Edinburgh Exhibition forwarded by the proprietors of the *Daily Graphic*. First of all there was the original sketch by the artist with the negative taken therefrom, then the type blocks, which in turn had been prepared from same, and the corresponding composition mould, and, finally, the cylindrical form the actual printing surface had been made to assume. The scene depicted was that of the Tannton disaster, and the illustrations had appeared in the number for the day preceding that of the opening of the exhibition. In our own town collotype, as most of you are aware, is a photo-mechanical method being more or less developed—I speak advisedly when I say that I know of work being turned out equal to what is done on the Continent, which was originally the home of collotype.

I may with advantage, I think, refer to the literature of photography, which has greatly multiplied of late. While the two oldest journals in the country—*The British Journal of Photography*, and the PHOTOGRAPHIC NEWS—have reached their thirty-seventh and thirty-fourth volume respectively† (the contents of one year constituting a volume), the interest in everything appertaining to photography is now so great that publishers are found entering the field with new ventures, and each one is trying his best to give the fullest possible value at the minimum of cost. Witness *Photography*, the *Practical Photographer*, *Photographic Answers*, &c. The latter is a marvellous pennyworth; each number contains an excellent collotype, which I don't think could, *per se*, be produced at the money.

In Mr. Stead's magazine, the *Review of Reviews*, a new departure was inaugurated in the number for the month of August. A compilation of the more important photographs which have appeared since the publication of the previous number is now given in each issue. Productions of the more important add to the interest of this classifying of the photographs of the month. Here again we find photography lending a helping hand, for the reproductions are invariably photographic blocks. In the August number already referred to, portraits of Mrs. Stanley, Millais, and Leighton are given. In the September number, portraits of the Duchess of Teck, Princess Victoria, and the Bishop of Winchester appear. In October, Carmen Sylva, Queen of Roumania, and several portraits of the Ober Ammergau Passion Play are figured; while the most recent, that of November, contains two reproductions of portraits, and eight detective shots at the recent Tipperary trials, taken by Mr. Hindley, the principal of Fallowfield & Co., with his "Facile" hand-camera.

A purely art collection has recently been issued under the title of "Sun Artists." It has now reached its fifth number, and the photographic productions of such men as Gale, H. P. Robinson, Lyd Sawyer, R. Robinson, are reproduced in photogravure. The last number is devoted to the work done by the late Mrs. Julia Cameron.

Then, again, there has been running for some time a publication appearing monthly, published by Cassell's, and entitled *Cabinet Portrait Gallery*. With each number three excellent Woodburytype illustrations are given of celebrities of the day with appropriate letterpress. I have the number published with me this evening, and you can inspect them afterwards. A very interesting work by Werge, of London, having as title "The Evolution of Photography," appeared not long ago. It appeals, however, more directly to those interested in the history of our art. Some portraits are therein reproduced of the pioneers of photography that I have not seen anywhere else, notably Archer, Reade, Kennett, and Goddard; they are collotype, and, although somewhat small, convey a great deal. The book is here for your inspection.

Enough has been said to show how very actively on all sides we find photographic literature extending. Surely this is a testimony, if testimony be needed, that our art is advancing by leaps and by bounds, that it is in very deed becoming part and parcel of the daily life. As an Association it is our high privilege to take part in the general advancement of photography which we see going on all around us. We surely would not be true to the purposes and aims of this Association of ours if we did not feel—if each one of us did not feel—a glowing enthusiasm for that art which may truly be said to have wrought wonders in the past, and which, I may safely venture to affirm, has a still greater future before it. The possibilities of photography are in no sense to be limited and confined, and he would be a bold man who would assert that the highest pinnacle of photographic discovery and photographic utility has now been reached. I think the lines of exhortation in the well-known poem of Longfellow appeal no less strongly to us as a corporate body than they do to the individual:—

"Let us then be up and doing
With a heart for any fate,
Still achieving, still pursuing,
Learn to labour and to wait."

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical meeting on Tuesday, December 23rd, at 8 p.m., at 5A, Pall Mall East.

THE DEATH OF J. VAN NECK.—Joseph Van Neck, amateur photographer, and brother of M. Louis Van Neck, manufacturer of photographic apparatus at Antwerp, while on his way to Egypt, was washed by a great wave off the bridge of the *Tang-Seké*, and was drowned. On more than one occasion Joseph Van Neck has been rewarded by the Belgian Government for saving others at the peril of his life, and he was much respected in Brussels and Antwerp.

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* Concluded from p. 973.

† The consecutive number of the PHOTOGRAPHIC NEWS to-day is 1,685, and that of the *British Journal of Photography*, 1,598. See also the PHOTOGRAPHIC NEWS of August 23rd, 1889, page 557.—ED.

NATURALISTIC PHOTOGRAPHY.*

Mr. R. B. Lodge began his paper on naturalistic photography by saying that it appeared to him that people start with the assumption that what the human eye is capable of seeing is what the photographer should strive to represent. Apart from the fact that probably no two persons see a landscape really the same, it is impossible to represent on a plane surface—such as a piece of paper or canvas—all the infinite variety and detail seen in any given landscape, and give not only all the detail, but the relative strength, beginning at the distance, and the result would be that the middle distance would be so strong that the foreground would not tell out against it.

The reader then referred to the older art of painting, and said that artists would find it useless attempting to paint the distance as strongly as it could be seen; they merely suggest the distance, and keep the full strength for the foreground, by that means giving the effect of atmosphere to the rest.

Mr. Lodge then proceeded to criticise the plates in Dr. Emerson's "Pictures of East Anglian Life," some of which he considered perfect, but regretted that many subjects were spoilt by an undue striving after tone—although tone and breadth are excellent and necessary qualities in a picture as long as they contribute to the truthfulness of the effect. Many of the prints are completely wanting in atmosphere: the distance looks as near as the foreground, there being no attempt at daylight.

Mr. Lodge agreed with Dr. Emerson's writings, but disapproved of many of his published photographs; he considered great good had been done to photography by his causing others to turn out better proofs of the truth of his principles than he can himself.

The reader then referred to Mr. Davison's work, which obtained the medal at the Pall Mall Exhibition, and said that there was breadth, tone, atmospheric truth, forming a most beautiful picture without any undue sharpness anywhere, yet nothing painfully out of focus, which is a great defect in many of Dr. Emerson's works.

Mr. Lodge concluded by saying that it is impossible to make hard and fast rules about focussing a composition, and treatment generally of a subject; it entirely depends upon circumstances; in some cases sharpness and all possible detail are necessary, in others they would be fatal to success. Generally speaking, he himself has a strong preference for a subject which depends upon composition and effects for its beauty, not upon intricate detail, and pointed out that sharpness and detail are the easiest things to obtain, but granted that in the right place they help to make a picture; they are not the chief points to strive after; on the other hand, it is extremely difficult to subordinate the distant parts of a picture so as to obtain the desired breadth, and to give prominence to the foreground.

Belitzki's Durable Reducer.—This reducer is prepared by dissolving in the order given—

Ferric potassic oxalate	10	grammes
Sodium sulphite (neutral)	8	,,
Oxalic acid	...2½ to 3	,,
Sodium hyposulphite solution (1 : 4)	50	,,
Water	200	,,

This solution keeps well in the dark, and may be used at once after fixing.

* Abstract of a paper read before the Enfield Camera Club.

THE PICTURES AT THE EDINBURGH PHOTOGRAPHIC EXHIBITION.

Class II.—Landscapes above 8½ by 6½.

Between sixty and seventy pictures are entered under this class, and if they were all arranged in such a way that the eye could take a general survey of the whole, the attention would be at once attracted by No. 605, as being distinct in character from all the rest. This is due to the fact that No. 605 consists of three pictures printed in a red-brown colour on very rough-textured drawing-paper, whereas all the rest are tones of grey and black upon ordinary smooth—generally matt—paper. The three pictures entitled "Penzance Harbour," "Autumn Sunset," and "Torbay" are by Colonel W. L. Noverre, and, apart altogether from the special features referred to, are exceedingly picturesque. The rough paper lends itself admirably to enhance the effect of light and shade, particularly aiding the reflections in the water, and giving richness, force, and an imagined detail to what might otherwise have been hard and, perhaps, uninteresting. Two of the pictures each represent a vessel on a slightly rippled sea, with bright sunny sky, the distance being a town, and a low, wooded shore respectively, each in thorough keeping, and duly retiring. The immediate foregrounds are simply the quiet sea, just broken by the glancing light on the ripples, very translucent, the reflections admirable, the whole combining to make exceptionally beautiful results. But it is probable the central picture will have even more admirers; it is a sunset effect, the main light falling on the sea at the horizon, immediately behind a black rock, which materially adds to its intensity. The lines of light in a particularly fine sky all converge to this focus, while the foreground completes a harmonious whole that is exceedingly satisfactory.

H. P. Robinson is specially strong in this class, and we do not remember to have seen him to better advantage. There are a simplicity and truth about his work that are peculiarly pleasing. No. 645, "The Moorhen," is one of the gems of the Exhibition. It is a beautiful composition, and an admirable example of Robinson's characteristic work. The subject is a simple landscape with two figures, exactly in the right place, peering between the branches of trees growing on a bank; the girls are evidently looking down on the moorhen's nest below. The three masses of light are most happily situated, and, altogether, its naturalness, completeness, and beauty lead one almost to forget the thought, the arrangement, design, and art necessary for its production, until reminded of it while considering where and how such another could be produced. No. 631, "Selecting Flies," is another capital picture, and, doubtless, many will think it quite equal to the one above alluded to. No. 632, "Waiting for Gaffer," is somewhat different in treatment and subject from the rest of this exhibitor's contributions. It is a rich and brilliant platinum print representing a grey and brown horse standing in a quiet lane, with a fine mass of foliage as a background. The beautiful, quiet light on the animals, which are most felicitously placed, the feeling of "waiting" so distinctly apparent, and so in keeping with the title, cause many an exclamation of pleasure from the visitors. Other works by Mr. Robinson also command attention, such as "Honeysuckles," "Baby's First Harvest," Sweet Spring-Time" (a couple of lovers, a grand old windmill, and a glorious sky). "Reflections" and "Ferrying Them Over" are characteristic works and charming pictures.

J. R. Gibson sends several carefully treated subjects, notably No. 179, "The Woody Banks of Tyne," which is a capital rendering of foliage in sun and shade, with a good foreground of rocks; also an effective picture entitled "From the Mill Dam." A grand rock occupies almost the whole of the middle distance, but allows a charming peep at a sun-lit distant landscape, while the foreground is occupied by curious waterworn, fissured rocks in the bed of a stream.

A. Williamson exhibits three views on Park Loch, Aberdeenshire. There is a quiet reposefulness about these that is very pleasing. In one with two ladies in a boat there is not a ripple on the water, each single reed has its own unbroken reflection, and the beautifully luminous sky, almost without any defined cloud, is eminently suggestive of peace. Another (No. 18) indicates an approaching sun-set, and expresses silent loneliness; both these are fine compositions, and show a highly cultivated taste.

R. C. Mossman sends a platinum print of the observatory on the summit of Ben Nevis. This also is eminently suggestive of silence and solitude, but totally different in character. Here we have a sombre sky unbroken even by a cloud, a dreary expanse of snow without a foot-print, and a conical mass of snow which, from its shape, we know contains the observatory. The utter solitude is accentuated by smooth snow between the meteorological instruments, which, with dogged perseverance, receive their visits at rigidly fixed intervals, both by day and night; no other sign of life. It is a suggestive picture.

J. Macmahon exhibits some capital views about Aberdeen. Two views of "Old Machar Cathedral" and "King's College" are worthy of notice; and his "Auld Brig o' Balgownie" is particularly fine, while "Aberdeen from the Harbour" is remarkable for its crisp, sharp detail.

J. R. G. Stroud sends some fine views in Jersey; they are printed in carbon; one is specially noticeable, an avenue with beautiful dappling lights and fine perspective.

Andrew S. Watson exhibits a quiet sunset with cloud and water, and a rocky foreground; it is very pleasing; also three brilliant views, "At St. Fillans," the central one by far the best.

George Bruce is represented by "Blanwearie Woods." This shows the entrance to a pine wood with a winding path. It is a difficult subject well treated.

Dr. Drinkwater is well represented by a frame of Scotch views. "On the Ardoch" is a pleasing picture of an old water-mill and trees, with a sun-shot stone-encumbered stream, lighting up the foreground and giving balance to the whole.

Mr. Harding Warner, Mr. John Mc Kean, and Mr. Graham Toler also exhibit good work in this class.

According to the official list some interiors, by Mr. John Moffat, are also in this class. These are remarkably good presentations of four difficult subjects. One, a drawing room with stained glass windows, is particularly well done. In this every detail of a fully furnished room is beautifully indicated—the draperies, marbles, paintings, the deepest shadows and highest lights are most skilfully treated. It is soft and harmonious, with a remarkable freedom from the spottiness so often seen in this class of work.

X. Y. Z.

IMPRESSIONISM IN PHOTOGRAPHY.*

BY GEORGE DAVISON.

THIS is an age of scientific inquiry in every branch of knowledge. Empiricism, irrational authority, and conventions, have been greatly cast aside, and freedom of thought and scientific investigation have taken their place. Phenomena are closely observed, and a basis of material fact and proof is demanded for every principle that is sought to be established, whether in biology, mental and moral science, or philology. Matter is held to be the storehouse of every possibility, and the observation of its infinite functions the only source of true and useful knowledge and progress.

The supernatural is losing its power to command worship, and a nobler wonder, roused by the laying bare of the natural causes of the phenomena of the universe, reigns in its stead. Poets and philosophers have, equally with scientists, been affected by the freer spirit. Literature has more of the true character of life and nature in it, and the newer light has even written its effect in our later students' text-books. Finally, in art the same influence is discovered in the revolt against conventionalism, and in the scholarly practice of those painters who have been variously called impressionist, naturalistic, and the like.

It would have been indeed strange if, amongst all these changes of principle and action, which we are pleased to call progress, the domain of art had remained untouched and unaffected, for the painter's art has been trammelled by conventions and chained by dogma equally with ethics and science. There have been unnatural conventions in regard to colour, conventions about form and proportions, conventions concerning light and shade, arrangement of lines, and decorative qualities, as well as many other marks and mannerisms imitated in a manner tending to obscure and lead away from the greatest beauty in pictures—namely, their truth to nature.

It has been well said, "It is so much easier to do what one has done before than to do a new thing, that there is a perpetual tendency to a set mode, but Nature abhors mannerism, and has set her heart on breaking up all styles and tricks." Now these "set modes" and conventional treatments in art have been such that the more they have been compared with natural facts—facts of atmosphere, facts of light, facts of colour—the more have their formality and falsity become apparent to unprejudiced observers influenced by the spirit of free and scholarly inquiry. Nothing but a return to nature can break up such "styles and tricks," and free an artist from the tyranny of previous great names and works. It was such a return to nature, such a close observation of natural appearances under the influence of the materialistic tendency of the age, that led to the growth and practice of the body of painters known as impressionists. Abandoning all consideration of the arrangements and mechanism of previous workers, they have consulted only their impressions of natural scenes, and, to those impressions, painted. With one point of sight and one subject of supreme interest, they have aimed to seize, above all else, the action and first impression of that subject. The effect of such work upon the painters of the older conventions, and upon their following amongst the public, was to rouse hot opposition, but the best of the new influences have had very considerable effect upon the more liberal of established painters. De Chesneau, writing of the pictures of M. Monet, says: "In spite of such works as these, the eye of the public—trained to exclusiveness by long intercourse with other and no less legitimate readings of nature, and prevented, in a great measure, by the abuse of facile tricks of painting—refuses as yet to recognise the purpose and merit of this school. But it will come to it."

A more judicious section, those who seek a natural and scientific basis for their practice, has preferred, as far as such tenets permit any crystallizations, to style itself "The Naturalistic School." The painters of this school, seeing the conventional untruths generally practised in pictorial representations in regard

* A paper read last Wednesday night at the Society of Arts; Mr. Francis Cobb occupied the chair.

to light, colour, and atmosphere, have set themselves to the practice of close observation of nature to gain a better knowledge of the infinite mysteries of these phenomena. Truth to nature is the first article of their faith, and the truest that science teaches concerning light and colour, and the manner in which the eye sees, is made a guiding principle. Every naturalistic artist must be a scholar. Happily, a cultured sense arrives at the same preference as that to which, in the main, the scientific inquirer is led. Should any fresh investigation lead to a truer view of physical or mental fact, the naturalistic student, to deserve the name, must readily make a re-adjustment of his principles, and modify his methods in accordance. It is not unnatural that the eccentricities as well as the genuineness of a new development should come to be regarded as distinctive of a school, but it must be remembered that any tenet or practice to be naturalistic must stand the test of scientific investigation. Naturalism, then, instead of signifying indistinctness and eccentricity, as is not uncommonly supposed, purports to be the gospel of common sense, scientific inquiry, and culture in art. It leaves its advocates free to express themselves about what is going on in the world by means of their graphic art, without other trammels than a severe regard to truth, naturalness, and perfect expression. The naturalistic painters find the possibilities of all poetry in nature; it is truthful representation, perfect expression, that constitute their art. They hold that what is seen should be painted, that symbolism and imaginative creations can have but a feeble interest, and that what we have actual contact with in life affords the opportunity for the most powerful expression by graphic art of any abstract quality. It is in the life of to-day, and not in the illustration of other people's ideas, whether past historical subjects or so-called works of imagination and allegory, that the proper province of the painter's art is to be found. To be true, and living, and moving to our sensibilities, the scenes and subjects depicted must be studied directly from nature by the artist.

Should anyone desire to get a better idea of the tenets of the naturalistic school, I would refer him to Mr. Francis Bate's book, "The Naturalistic School of Painting," a fresh, direct, convincing little work which every photographer should read, and, in parts, re-read, and to which I wish to express my own indebtedness.

Under such principles have been produced paintings which have the power of moving a sympathetic, nature loving observer to the keenest of æsthetic pleasure, an ecstacy of enjoyment far beyond any satisfaction derived from the "fitness of symbolism," or decorative arrangement. Some may never have discovered this feeling for subtle representations of natural scenes, but no one is capable of estimating the respective merits of the old and the new, the power of such poetry as is shown in symbolical or decorative work as compared with the poetry of naturalism, who has not felt enraptured by the perfection of naturalness of some of these genuine impressionist paintings. There is a liveliness, an exuberance of joy, a yearning for a sympathetic companion to share the feeling of exultation, when one has happened suddenly upon a subtle fact of natural light, colour, air, or form happily touched off, a curve of the beach, a boat seen from the shore level on a stormy day over the crests of the surf, a broken bit of ground in sunlight, and the like.

It is only in the light of such views, then, that I care to examine or put forward the claims of photography, as, indeed, of any other method, to be admitted as a capable means of artistic expression.

Photography compels to much that is naturalistic. It has proved the keenest critic of conventionalism, and has exerted great influence upon the painter's art; influence, sometimes good or bad, individually, according to the knowledge and power, or the ignorance, of the painter influenced by it, but in the main tending towards greater truth and insight. In regard, however, to its own direct claim to be admitted as a means of artistic expression, it has only happened with the introduction and application to photography of these principles that any serious demand to be recognised in the domain of art has been made. Photographers have previously been rather inclined to accept the slur commonly cast upon their means and results as mechanical, and have exaggerated the limitations which their tools and technique impose upon them. They seem to have been unduly influenced by the patronage of some classes of painters who have despised and contemned photography, partly with justice, seeing the average published results, and partly through ignorance of its possibilities. Photographers have accepted this degradation of their art, and have even joined voice in deprecating any reform or movement which promised better artistic expression as "aping the conventionalities of painting." For example, some of the photographers of the older conventions have latterly objected to any but the most limited use of focussing for expressing the relative interests of a picture, and have even insisted that definition is the distinctive characteristic of photography. They have inveighed against rough surfaced prints as being in imitation of sepia drawing, appearances presumably held to be the sole privilege of the brush workers, and, whilst claiming for decorative, historical, imaginative, and symbolical painting the highest credit in art, they have disclaimed for their own medium any power or province in such work.

Mr. Stillman holds that photography can have no place in art because design is impossible to it, and design he seems to define as "deliberate arrangements" carried out by hand. Mr. Pringle denies the possibility of what he terms "fine art" to photography, or at least to any but combination photography, by the peculiar distinction that he lays down when he says, "Art obtains where a painter simply paints what he has before him. This is not fine art." Mr. Gale finds the greatest happiness in what he alludes to as a transformation of nature and "those ideal representations which are the perfection of art," and in this reference he instances Turner's "Storm." Mr. H. P. Robinson approves and seeks to justify a wilful opposition between art and nature, and he goes with Mr. John Brett in demanding an improvement of nature, an exaltation of natural appearances, and an accentuation of beauties in pictorial representations, a position, perhaps, intended to justify combination printing.

There are other alleged limitations and defects, such as that photography cannot treat the sublime, that the nude is outside its scope, and a variety of cries all more or less included in the general exclamation that photography is merely mechanical.

(To be continued.)

THE PHOTOGRAPHIC CLUB.—On December 24th (Christmas Eve) there will be no meeting; December 31st will be a Lantern evening; subject for January 7th, 1891, "Photo-Micrography."

THE REASON WAS APPARENT.—Lawyer: "On what ground do you seek a divorce?" Female client: "My husband is an amateur photographer, and ——" Lawyer: "That will do. We'll have no trouble about it. My wife has the craze too, and I have been taking my meals at a restaurant for two weeks."—*Norristown Herald.*

LANTERN PLATES.—The Britannia Works Company has sent us some special lantern plates for black tones. After trying several of the specimens, both for printing by contact and in the camera, it was found that they gave good slides, with short exposures, and the images came up rapidly under the action of the quinol developer recommended by the makers. They are rapid, and of a clean working nature. Those tried in the camera were, on account of the dull weather, exposed to the magnesium light softened by ground glass, and yielded good results.

A WAX FINISH.—An exchange says: "An admirable wax finish for furniture woods is made by mixing about three ounces of tallow and three and a quarter pounds of wax with one pint of turpentine, which is constantly stirred while boiling and until cold. The paste is rubbed in, the superfluous wax removed with a wooden scraper, and then gone over with soft woollen cloths until it shines. Some workmen prefer to let the wax dissolve in the turpentine cold, as they fancy the heat diminishes the polishing effect. If a coat of French polish is afterwards applied it deepens the gloss."

ASTRONOMICAL TELESCOPES.*

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

AT less than nine inches distance objects become more and more indistinct as they are brought nearer to the eye. From what we have seen of the action of the lens in producing pictures of near and distant objects, we know that some movement of the screen must be made in order to get such pictures sharply focussed, a state of things necessary to perfect vision. We might therefore suppose that the eye did so operate by increasing, when necessary, the distance between the lens and retina, but we know that the same effect is produced in another way; in fact, the only other way. The eye, by a marvellous provision of nature, secures the distinctness of the picture on the retina of all objects beyond a distance of about 9 inches, by slightly but sufficiently varying the curvature of one of the lenses; by an effort of will, we can make the accommodating power of the eye slightly greater, and so see things clearly a little nearer; but at about the distance of 9 inches, the normal eye is unconscious of any effort in thus accommodating itself to different distances. The picture produced by the lens of the eye, whose focal length we will assume to be six-tenths of an inch, falls on the retina, which we will assume further to be formed of a great number of separate sensible points, which, as it were, pick up the picture where it falls on these points, and through the nervous organisation produce the sense of vision. Possibly, when these points are affected by light, there may be some connective action, either produced by some slight spherical aberration of the lens, or otherwise; but I do not wish to go any further in this matter than is necessary to elucidate my subject. What I am concerned with now is the extent to which the sensibility of the retina extends. Experiment tells us that it extends to the perception of two separate points of light, whose angular distance apart is one minute of arc, or, in other words, at the distance we can see best, two points whose distance apart is about 1-400 of an inch. This marvellous power can be better appreciated when we remember that the actual linear distance apart of two such points on the retina is just a little more than 1-6000th of an inch.

In dealing with the shape of small objects, the difference between a circle, square, and triangle can be detected when the linear size of their images on the retina is about 1-2000 of an inch. It may be therefore fairly taken that these separate sensible points of the retina are somewhere about 1-12000 part of an inch apart from each other. Wonderfully minute as must this structure be, we must remember, as we have already shown, that the actual size of the image it deals with is also extremely small. This minuteness becomes apparent when we consider what occurs when we look at some well-known object, such as the full moon. Taking the angular diameter of the moon as thirty minutes of arc, and the focal length of the eye at six-tenths of an inch, we find the linear diameter of the picture of the full moon on the retina is about 1-200 of an inch, and assuming that our number of the points in the retina is correct, it follows that the moon is subject to the scrutiny of 2,800 of these points, each capable of dealing with the portion of the picture that falls upon it. That is to say, the picture, as the retina deals with it, is made up to this number of separate parts, and is incapable of further division, just as if it were a mosaic. I think this is really the case, and as such a supposition permits us to explain not only what occurs when we assist the eye by means of a telescope, but also what occurs when we use the telescope for photographing celestial objects, we will follow it up.

In the case of the eye, we suppose the image of the moon to be made up through the agency of these 2,800 points, each one capable of noting a variation in the light falling upon it. In order to make this rather important point plainer, I have had a diagrammatic drawing made on this plan. Taking a circle to represent the full moon, I have divided it into this number of spaces, and into each space I have put a black dot, large or small, according to the intensity of the light falling on that part of the image, as determined by looking at a photograph of the moon. You will see by the picture of this moon the effect produced. It represents to those who are at a sufficient distance the moon much as it is really seen in the sky.

We can now, with a lens of the same focal length as the eye, obtain a picture of the full moon exactly of the size of the actual picture on the retina, and if we take a proper photographic process, we can get particles of silver approximately of the same sizes as the dots we have used in making our diagram of the moon; the grouping is not exactly the same, but we may take it as precisely so for our purpose. I have not any photographs of the full moon of this size, but I have some here of the moon about five, seven, and eight days old, which give a good idea of what I mean by the arrangements of the particles of silver being like our diagram.

It is now quite apparent that if we can, by any means, increase the size of the picture of the moon on the retina, or make it larger on the photographic plate, we shall be able to employ more of our points in the retina of the eye, or of our particles of silver in the photographic film, and so be able to see more clearly just in proportion as we increase the size of the picture in relation to the size of the separate parts that make it.

Now the telescope enables us to do this for the eye, and a lens of longer focal length will give us a larger photographic picture.

Let us assume that, by means of the telescope, we have increased the power of the eye one hundred times. The picture of the moon on the retina would now be one-half inch in diameter, and instead of employing 2,800 points to determine its shape and the various markings upon it, we should be employing 28,000,000 of these points; and similarly with the photograph, by increasing the size of our lens we shall obtain a picture made up of this enormous number of particles of silver. But we can go further in the magnification of the picture on the retina; we can also use a still longer focus photographic lens.

A power of magnification of one thousand is quite possible under favourable circumstances; this means that the picture of one two-hundredth of an inch would be now of five inches in diameter, so we must deal with only a portion of it. Let us take a circle of one-tenth of this, equalling one-hundredth of our original picture, which in the eye, unaided by the telescope, would have a diameter of one two-thousandth of an inch, or an area of less than one five-millionth of a square inch. This means that, with this magnification, we have increased the power so enormously that we are now employing for the photographic picture two thousand eight hundred million particles of silver, and in the eye the same degree of increase in the number of points of the retina employed in scrutinising

* Continued from page 929.

the picture piece by piece as successive portions are brought into the central part.

Photography enables me to show that the result I have given of the wonderful effect of increasing the optical power is perfectly correct as far as it is concerned. We will deal with a part only of the moon, representing, as I have just said, about one-tenth of its diameter, or one-hundredth of its visible surface. Two such portions of the moon are marked, as you see, on the diagram. I have selected these portions as I am able to show you them just as taken on a large scale by photography, so that you can make the comparison in the most certain manner; but let us first analyse our diagrammatic moon—let us magnify it about ten times, and see what it looks like.

(To be continued.)

Patent Intelligence.

Applications for Letters Patent.

19,980. W. TYLAR, 12, Cherry Street, Birmingham, "Lens Cap."—December 8th.

20,022. B. JUMEAUX, 17, St. Ann's Square, Manchester, "Mounting Lantern Slides."—December 9th.

20,199. A. PALMER, 36, Briar Street, Nottingham, "Negative and Print Washers."—December 10th.

20,239. A. STAEHLE, 18, Buckingham Street, Strand, London, "Cameras."—December 10th.

20,286. E. VASSORT, 120, Chancery Lane, London, "Photometers."—December 12th.

20,394. J. DAVIDSON, 24, Southampton Buildings, London, "Pressed Glass Dishes."—December 13th.

Specifications Published.

18,583. *Nov. 20th*, 1889.—"Optical Lanterns." ALEXANDER HUGHES, 59, Fenchurch Street, London, Optician.

The inventor claims :—

1. The construction and arrangement of biunial, triunial, or other multiplex optical lanterns, in which each optical system is so mounted as to permit of the adjustment of each lantern one to another without distorting the optical axis of the one or the other.

2. A multiplex optical lantern, in which each lantern system is adjustably mounted and pivoted on vertical supports for angular adjustment, and retained in position by telescopic or adjustable supports attached to each lantern.

3. The construction and arrangement of an optical lantern, allowing parts of it to be manufactured of aluminium to reduce the weight, substantially as described.

4. In such an optical lantern, a light box so constructed that the roof or top shall fold down for transport and be capable of being raised by a radial movement around its centre in an angular direction to permit the better ventilation and carrying off of heat.

859. *January 16th*, 1890.—"Aluminium." HELEN WHITE, 2, Church Fields, Cheshunt, Hertford, Widow, Executrix of William White, deceased, late of 2, Church Fields, Cheshunt, aforesaid.

This invention has for its object to effect the manufacture or production of aluminium in a more economical and ready manner than has hitherto been done.

In the manufacture of aluminium cryolite has been used, but it has the serious objection that it is frequently contaminated with iron silica and other impurities. According to this invention, I manufacture the aluminium from aluminium fluoride, which I prefer to prepare artificially, so as to obtain it in a pure or practically pure state, and I utilize the bye products of the manufacture of the aluminium from the aluminium fluoride in the production of fresh quantities of aluminium fluoride as hereinafter described. I may prepare the aluminium fluoride by evaporating to dryness a solution of alumina or aluminium hydrate in hydrofluoric acid.

The aluminium fluoride is heated with sodium or potassium, or a mixture of them, aluminium is liberated, and fluoride of sodium (or of potassium, or of both) is formed. An excess of aluminium fluoride is preferably used, as it helps by combining with the fluoride of sodium (or of potassium, or both) to form a suitable flux for the metal. This flux, when treated with sulphuric acid, gives up its fluorine as hydrofluoric acid, which is used for dissolving alumina or alumina hydrate in preparing fresh supplies of aluminium fluoride.

What I claim is :—

1. The use of the fluoride of aluminium obtained by evaporating to dryness a solution of alumina or aluminium hydrate in hydrofluoric acid.

2. The production of aluminium, substantially in the manner hereinbefore described.

12,921. *August 15th*, 1889.—"The Production and Representation of Instantaneous Photographs." WORDSWORTH DONISTHORPE, 32, Pembridge Villas, Bayswater, Middlesex, Barrister-at-law, and WILLIAM CARR CROFTS, Westminster Chambers, 7, Victoria Street, Westminster, Gentleman.

This invention has for its object improvements in the production and representation of instantaneous photographic pictures.

The pictures are produced upon a sensitive film or surface carried by a long roll of paper or other material.

The roll is continuously unwound from one drum and wound upon another, and in its passage a series of images is successively thrown upon it by a photographic lens. A screen is provided between the lens and the exposed sensitive surface. This screen travels out of the way to permit the image to fall on the sensitive surface, and covers the lens again as soon as the exposure is complete. These operations take place with regularity, and usually great rapidity, so that several pictures are taken in each second during the time that the apparatus remains at work, which will be for many successive seconds, indeed for any length of time which may be desired. The scene selected for photographic presentation will be one of constant movement—for example, a street scene—so that each picture will differ slightly from the preceding and succeeding pictures.

The camera may be arranged in the following manner : In the fore part is the lens, and immediately behind the lens the screen, which regulates the instantaneous exposures. The screen may be an endless band passing around pulleys and travelling at high velocity. In the band there are two perforations or apertures, and twice in each rotation of the band these perforations coincide, and the light is then able to pass from the lens through the perforations on to the sensitive surface. The lens forms the scene upon the sensitive surface. The focus is accurately adjusted before commencing the operation by the aid of a slide on which there is a focussing glass and guide rollers, over which the continuous sensitive paper or material passes.

The screen and the winding apparatus are so geared together that the sensitive surface travels the distance necessary to separate the pictures between one exposure and another. In place of the travelling perforated belt, a disc perforated with a narrow slit, and driven by bevel-wheels, may serve the purpose. After the pictures have been taken, the roll is removed from the camera, and the pictures upon it are developed in the ordinary manner. From this continuous band of negative pictures a similar band of positive pictures is produced, and rendered transparent by the application of vaseline, or vaseline oil, or by any other suitable process.

For the exhibition of the pictures, a lantern similar to the ordinary magic lantern—or, if a non-transparent positive band is used, then a lantern similar to the opaque magic lantern—is employed, in which a brilliant intermittent electric light is provided. The lantern is provided with condensing and focussing lenses, by the aid of which the light, after having passed through the transparent positive picture, is focussed upon a screen. Each picture is thus exhibited only by one flash of the intermittent light, for the band of pictures travels on, and by the time the next flash occurs another picture is in place. Thus several pictures are exhibited upon the screen in each second of time throughout the whole period of exhibition, which will usually be approximately the same as

that occupied in taking the pictures. The change from picture to picture, aud the flashing of the light is so rapid (about seven flashes per second) as not to be discerned by the eye, and the appearance on the screen is that of a picture in which the auimate aud other objects exhibited are in movement. In order that the flash may synchronise accurately with the picture in position, contact pieces are provided upon the travelling band, and by the passage of these the flashes are determined. Or a contiuuous light, electric or other, may be used, and the recurring flashes obtained by a perforated screen travelling at high velocity, as in the camera above-described, the coincidence of the flashes with the centre of each successive picture being insured by increasing or diminishiug the speed of the travelling band of pictures by an arrangement for the insertion or withdrawal of a tapering driving drum, or other appropriate meaus.

Correspondence.

THE PLATINOTYPE COMPANY AND THE REDUCTION OF PLATINUM PRINTS.

SIR,—In the PHOTOGRAPHIC NEWS just to hand, the Platinotype Company say that there must be soue mistake in my reference to their having stated that strong hydrochloric acid would reduce black platinum prints. At the meetiug of the Photographic Society to which they refer, I recited the substance of what I now quote from the report of a meeting of the West London Photographic Society, at page 915 of the NEWS, and also at page 749 of the *British Journal*.

"Mr. Jones (Platinotype Company) gave an account of the platinotype process."

"Mr. Blackmore said that . . . . on putting a very much over-exposed sepia print in the developer it flashed up immediately very dark and dense; then, on transferring it to some strong hydrochloric acid, considerable reduction took place, and the print became quite passable. He would like to know whether the black process was susceptible of reduction in the same way."

"Mr. Jones replied that . . . . the strong acid would reduce a black priut just as it did the sepia one, but would rot the paper."

In answer to my question at the Photographic Society of Great Britain, it appeared that no one present had had such experiences as these. The Platinotype Company now say that they have never experienced the reduction of a black image by hydrochloric acid, and I would ask them whether, to their knowledge, sepia prints are or cau be affected by the strong acid in the manner indicated above. CHAPMAN JONES.

IDEALISTIC PHOTOGRAPHY.

SIR,—In your issue of the 12th iust. you quote a paragraph froui the *Photographic Art Journal* eutitled "Idealistic Photography."

I must poiut out to you that the implication of unfairness coutaiued therein is in itself unfair. The subject was first opened at the London and Provincial Photographic Association by Mr. Phillip Everitt, who read a very able paper on the subject of "Pictorial Definition," in which he showed himself strongly sympathetic with Dr. Emerson's principles. He, unfortunately, declined to allow the paper to be published, but it led to a considerable amount of discussion, the interest taken in the subject generally being very great. That paper was followed after a short time by one by Mr. W. E. Debenham on the "Unnaturalness of Naturalistic Focussing," and another on a following evening by the same gentleman eutitled "Is Blurring Desirable?" Both papers were also received with great interest by the members, and Mr. Debenham was heartily thanked for the exhaustive mauner in which he had dealt with the subject. The papers by Messrs. Newman and Collier also followed on the samo side, condemuing Emersouian ideas, as advocated by Mr. Everitt in his paper.

It is neither within the powers or province of the Association to produce Emersonians, in order to hear *more* on that side of the question, nor to compel those who may exist to find and bring forward more arguments against those in the papers read by the opponents of Dr. Emerson's views.

As the writer of that paragraph was evidently unaware of the exact facts when he wrote, in fairness to those gentlemen who have treated the subject so fully in their papers, I must ask you to publish this explauation, and so repair to some extent the harm which is so often done when statements are made which cannot be supported by facts.

THE HON. SECRETARY, L. and P. P. A.

THE CALCUTTA PHOTOGRAPHIC EXHIBITION.

SIR,—We regret to say that the number of exhibits forwarded to us from abroad is so small that it has been decided to abandon the International Exhibitiou advertised to be held in December, 1890.

The Photographic Society of India beg to tender their best thanks to those who have despatched exhibits, and can only express the hope that on another occasion they will not be deterred from once again assisting us.

All exhibits will be returned, carriage paid, as soon as possible. JOHN S. GLADSTONE,
A. FLEMMING,
Hon. Secs., Photo. Society of India.

Calcutta, November 11th, 1890.

PRINTING FRAMES.

SIR,—Kindly allow a correction to be made as follows: The frame noticed is not Mr. Walter Tyler's, but emanates from me. From notices that have already appeared, many persons seem to think I am "trying to hash up an old dish with new trimmings," and have expressed as much. I beg, however, to state that my frame differs entirely from any previously issued, inasmuch that the back of the frame is designed in such a manner as to firmly grip the print and prevent any chance of the paper moving during the opening or closing of the flap used to examine the prints. From the uotice you give you evidently noticed this particular feature in my frame. By inserting this you will oblige. WILLIAM TYLAR.

Birmingham.

THE YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB SYLLABUS.—January 29th, 1891, Lantern Exhibition; February 26th, "New Priuting Processes," C. H. Bothamley, F.I.C., F.C.S.; March 12th, "Tone and Colour in Lanteru Slides," Prof. Jacob, M.A., M.D.; April 30th, Exhibition of apparatus.

PHYSIOLOGICAL EFFECT OF A BRIGHT LIGHT.—A curious phenomenon was observed at the end of the annual concert given at the Salpétrière Hospital, Paris, by the Lionnet Brothers, assisted by a great number of artists. The concert over, M. Londe, director of the photographic service of the hospital, wished to "take" the audience hall. For this it was necessary to burn a strip of maguesium. The blinding light, although it lasted but ten seconds, threw several of the patients into a cataleptic state. The effect of light, however, ou highly sensitive persons is knowu. It is iu this manuer that, at the Charity Hospital, Dr. Luis acts on his patients by means of the luminous reverberation produced by revolving mirrors.

THE ROYAL INSTITUTION.—The foilowiug is the list of Friday evening lectures at the Royal Institution during the first half of the couiug session:—Friday, Jauuary 23rd, Lord Rayleigh, M.A., D.C.L., LL.D. F.R.S., M.R.I., "Some Applications of Photography"; Friday, January 30th, Sir Edward Fry, Lord Justice, F.R.S., F.S.A., F.L.S., M.R.I., "British Mosses"; Friday, February 6th, Professor J. W. Judd, F.R.S., F.G.S., "The Rejuvenescence of Crystals"; Friday, February 13th, Professor A. Schuster, Ph.D., F.R.S., F.R.A.S., "Some Results of Recent Eclipse Expeditions"; Friday, February 20th, Edward Emanuel Kleiu, M.D., F.R.S., "Infectious Diseases, their Nature, Cause, and Mode of Spread"; Friday, February 27th, Percy Fitzgerald, M.A., F.S.A., "The Art of Acting"; Friday, March 6th, Professor J. A. Fleming, M.A., D.Sc., M.R.I., "Electromagnetic Repulsion"; Friday, March 13th, Felix Semon, M.D., F.R.C.P., "The Culture of the Siuging Voice"; Friday, March 20th, Professor W. E. Ayrton, F.R.S., "Electric Meters, Motors, and Money Matters."

Proceedings of Societies.

The Camera Club.

On Thursday, last week, the last meeting of the Camera Club in its old premises at Bedford Street, Strand, London, was held under the presidency of the Rev. F. C. Lambert, M.A., and Lieutenant Gladstone read a paper on the "Photographing of Interiors."

Mr. Gladstone, in the course of his remarks, said that the images of windows, when photographing interiors, are often visible before development. A stop, giving the focal length of *f*/20 and sometimes a slightly larger focal length, is often convenient to use in such work; an exceedingly small increase in the size of a stop will, where it can be employed, save much time in exposure. Direct sunlight streaming through the windows is usually bad, but in some few cases it is an advantage. When half a window is included in the view, too much light is thrown near it upon the wooden edge of the frame, and causes fog at one of the edges of the plate; the remedy is to bevel and roughen the wooden edge. Wide-angle lenses should always be avoided in interior work if possible; sometimes their use is a necessity, and they give better results to the eye when a wide vertical angle is included on the plate, rather than a wide horizontal angle. He used a tripod head with another head on the top of it, the level of which latter is governed by screws, as in the theodolite; this device is useful when suitable resting places for the feet of the camera cannot readily be found. Circular spirit levels are exceedingly useful. The normal developer employed by any photographer, if diluted with an equal bulk of water, will form a suitable normal developer for interior work. No photographing of interiors should be attempted without backed plates; he used black varnish for the purpose.

Mr. George Davison remarked that the excellent results produced by Mr. Gladstone showed the advantage of taking up one branch of photographic work and sticking to it thoroughly.

Mr. Lyonel Clark spoke of the excellence of the film negatives exhibited by Mr. Gladstone, and wished to know who made the films.

Mr. Gladstone stated that he used Eastman's stripping films.

Mr. Clark thought it best to do without backing; staining the films themselves with eosine would do as well, and some other coal-tar dyes were suitable.

Mr. Corbould said that some eosines were acid, and slowed the plates; some of the others were alkaline, and caused fog.

The Chairman remarked that he, like others, had found that with the long exposures necessary in interiors, the people walking about in the building usually did not spoil the picture, but once a lady walking about with a large white bonnet on her head had spoilt one of his negatives. None of the backings for plates had answered satisfactorily in his hands, but black carbon tissue soaked in equal proportions of glycerine and water had worked best according to his experience.

Mr. A. Maskell thought that direct photographs of monumental brasses would be of more value than rubbings.

Mr. Gladstone thought that the brasses should first have something rubbed over them for a time, to diminish their glare. During long exposures, sometimes parts of the film moved slightly, probably from changes of temperature, so as to present local areas out of focus. An effective size of plate for certain architectural subjects he had found to be 12 by 8 inches. Stripping films gave much better interiors than did any dry plates. Reflections from one or more of the surfaces of the lens would sometimes throw on the plate, where it was not wanted, a secondary image of a window in the field of view.

The Photographic Society of Ireland.

An ordinary meeting of this Society was held at the Rooms, 15, Dawson Street, Dublin, on Friday, 12th inst., Mr. G. Mansfield, president, in the chair. Some queries from the question box having been dealt with, Mr. Greenwood Pim described how he photographed the "Book of Kells" in the library of Trinity College, Dublin, and exhibited some beautiful prints giving a great range of shades representing the varieties of colour in that celebrated work. At the conclusion of Mr. Pim's remarks, a debate on the management of lantern exhibitions was opened by Dr. E. McDowell Cosgrave, and resulted in an animated discussion amongst the members.

The London and Provincial Photographic Association.

December 11th.—Mr. A. Collier in the chair.

Mr. Pemberton asked to what angle a graver should be ground to cut vulcanite.

Mr. A. Haddon said the cutting of vulcanite involved the frequent sharpening of the tool used. A graver such as was used for turning brass work would answer the purpose.

Mr. T. E. Freshwater, referring to the recent explosion of a gas pressure guage at Rochdale, enquired if any member was in possession of more particulars than had been published on the subject.

A Member believed that the gnage was full of oil, and that it was the first time it had been used.

Mr. L. Medland exhibited a "lantern slide exposer;" it was designed to suit hand exposure negatives, which were sometimes a little out in the perpendicular.

The rest of the evening was devoted to the exhibition of lantern slides; a large number was projected on the screen, contributed by Messrs. E. W. Parfitt, Teape, Aldhan, Kellow, Medland, Chang, and Freshwater.

Mr. Teape spoke of a means of remedying over-intensification with the uranium bath by using common washing soda, 10 grains to 1 ounce of water, as a bath, or applied locally with a brush. Reduction could be effected in a few minutes to any depth desired.

The Lantern Society.

At a special general meeting held at 20, Hanover Square, on December 8th, it was resolved that the entrance fee should be abolished, and members joining now are, therefore, only liable for the subscription.

At the ordinary meeting held on the same night, a paper was read by Mr. J. G. Grenfell, F.R.M.S., on "Means of Protection amongst Animals." The paper, which was illustrated by some fifty slides, was of considerable interest, the lecturer describing the various means adopted by animals for their protection in the great struggle for the survival of the fittest. Some of the methods employed were of a most remarkable description, more especially in the cases of mimicry, where the animals reproduce the appearance of natural objects with such marvellous exactitude as to defy detection.

The following are the arrangements for the meetings of the Society up to the end of February:—December 22, Mr. C. E. Gladstone, on "Some Architectural Features of Normandy and Brittany"; January 12, Mr. E. M. Nelson, F.R.M.S., on "The Lantern and its Relation to Photography and the Microscope"; January 26, Mr. C. Harrison, on "The Civilisation of Egypt and Assyria, as illustrated by its Physical Remains and Records"; February 9, Mr. J. Traill Taylor, on "Lenses and Condensers for Lantern Work"; February 23, Exhibition of Lantern Slides for members and their friends.

The Torquay Photographic Association.

A meeting was held on December 9th, when a discussion took place on "Silver Printing and Toning," opened by Mr. A. K. Blunt, M.A. (vice-president).

A series of prints toned by different formulæ was exhibited, also three prints taken by means of the electric arc in the $\frac{1}{10000}$ part of a second, of a jet of water.

Several ladies had joined the Society, which now numbers over fifty members.

The Notts Amateur Photographic Association.

The new Club Rooms were opened for the first time on Monday, December 15th. The Association, which was formed in December, 1884, formerly had rooms over a shop in Market Street. These, however, not being suitable, rooms were selected over Mr. Warwick's in the same street. These are much more comfortable, easy of access, and more suitable in every respect. The walls of the rooms were covered with

interesting photographs, the production of different members of the Association. Mr. S. WELLS presided, and there was a fairly good muster of members and friends. Mr. Henry Cooper was nominated for membership, and Mr. Laucelot Allen was elected a member.

Mr. G. E. SMITH exhibited, by means of his oxyhydrogen lantern, the slides of illustrated Bostou, U.S.A. ; also slides by members, including Mr. R. S. Armitage, Mr. Clements, Mr. Forrester.

Mr. BURROWS' notice of motion that sous of members (uuder eighteeu) be admitted at a reduced subscription was carried unanimously.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE ordiuary monthly meeting was held in the Mosley Street Café, Newcastle, on Tuesday, the 9th inst., Mr. J. P. GIBSON in the chair. Five new members were elected.

The new optical lautern, which has been subscribed for by the members, was in operation for the first time, and over 250 slides put through ; the lantern, operated by Messrs. Ridgway and Pratt, gave great satisfaction.

Nominations for officers for the current year were received, and the election will take place at the auuual meeting in Jauuary next.

THE GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE second geueral meeting of the session was held on 4th inst., in the Rooms, 207, Bath Street; Mr. WM. LANG, Junr., F.C.S., was in the chair. Messrs. A. Lindsay Miller and Alexander Munro, Junr., were admitted members, and afterwards Mr. Lang gave his Presideutial Address (see NEWS of last week, and coutinuation in this week's issue).

Mr. GEORGE BELL made a communication regarding the charges of the corporation for water supplied to photographers.

A hand-camera, designed by Mr. Robb for stereoscopic pictures, was shown to members, aud also a series of views taken in Norway with the apparatus.

BRECHIN PHOTOGRAPHIC ASSOCIATION.

THE new rooms of the above Association at 14, St. Mary Street, were opened by the president on the 9th December. They consist of a fair sized reading room, which is also to be used for meetings ; a dark room, in which benches have beeu fitted up and water laid on ; and cloak room.

Mr. ADAMSON, the president, opened with a lecture descriptive of a tour "From Liverpool to the Yosemite Valley by the Straits of Magellau," illustrated with lanteru slides ; and Mr. R. A. McLeau Murray exhibited over fifty slides of the Ruins of Pompeii, with which he intends to illustrate a lecture ou that ill-fated city.

Five honorary and two ordinary members were admitted ; the Rev. H. Campbell, Messrs. J. S. Baxter, D. Hunce, J. Simpson, and Watson as honorary members ; and Messrs. W. Ferguson and Colin Hutcheon as ordinary members.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—At the meeting held on December 10th, Mr. W. Bedford chairmau, four applications for aid were cousidered and granted.

CURIOUS PHOTOGRAPHS.—Remarkable success has been attaiued by Professor Ahu, of Breslau, in applying photography to fix the indications of different diseases of the eye. Another contribution to one of the newest departments of scieuce is Professer Fischer's photographs of cultivatious of luminous bacteria—which were photographed by their own light—the views giving evidence of the constaut movement in which the tiny organisms are unceasingly engaged. One of the greatest anthropologists of the century, in Paris, has been making a collection of the various types of mankind, and he does it by means of the photograph. He iuclines to the opinion that the type or origin of the race to which the person originally belouged is better preserved amoug women than among men.—*Wilson's Photographic Magazine.*

A. J. L., Birmingham.—Your communication has arrived too late.

Answers to Correspondents.

*** TO ADVERTISERS AND OTHERS.—The PHOTOGRAPHIC NEWS will be published on Wednesday next, so that announcements intended for insertion should reach the Publishers on Tuesday afternoon, before five o'clock.

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

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

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

F. R. A. S.—*Astronomical Photography.* Mr. Maunder's paper is not withdrawn, but only postpoued uutil the next meeting, which will be held at 50, Great Russell Street, Bloomsbury. During the holding of the Winter Exhibition at the Water Colour Society's Gallery, Pall Mall, the regulations do uot permit of our fitting up the oxyhydrogeu lantern which is required for showing the illustratious on a screeu. This can be done at the new premises on the 13th January.

M. P. (Jersey).—"*The Letter.*" The chromotypogravure illustration in the *Graphic* of 22ud ult. is certainly very fiue, but we agree with you iu the poiuts of detail meutioned. There is no *ink* in the pen, and a false lighting in the eyes, which could easily have been rectified.

J. B.—*Blue Developer for Primuline.* Your observatiou is not new. See leading article on the "Diazotype Process" at page 857 of the NEWS. The amidobetanaphthol sulphouic acid there mentioued is equivaleut to a mixture of eikonogen and acetic acid, and the use of it was demonstrated at the lecture.

C. R. PANCOAST.—*Gas for Optical Lantern.* Messrs. Wm. Sugg aud Co. have a double ring fifty-caudle argand, burning fifteen feet of gas per hour, with circular jets fixed level aud concentric, and faced with steatite. This has been tried recently for eulargements, and favourably reported upon, and there is no doubt it would serve well for moderate power optical lanterns. Address : Chariug Cross, W.C.

H. J. C. (Lewishaui).—*Capt. Abney's Reply to Messrs. Hurter and Driffield.* This will be found (page 17) in the curreut number of the *Journal of the Photographic Society*, having been reprinted from the *Journal of the Society of Chemical Industry.* Mr. Chapman Jones's article is also in the same number.

J. G. (West Hampstead).—*Printed Rulings for Half-Tone Zinc Blocks.* Enquire of Mr. J. J. Ayling, 12, Crane Court, Fleet Strcet ; or look at Advertisement on p. cxix. of the YEAR-BOOK.

WILMOT.—*Studies of Hoar-frost.* You ought to have been able to secure some good exposures during the past week. At page 143 of the YEAR-BOOK will be found directions for obtaining official permits, but, so far as our experience goes, iu the North London parks none are required.

LEDBURY.—*Stereoscopic Effect.* By holdiug up a stereoscopic slide at arm's length, and directing the focus of the eyes to au imagiuary point beyond, so as to bring the pictures separately within the range of vision, they will soon coalesce with formation of a ceutral (third) image in true stereoscopic relief. This is done by a species of outward squinting, which is easily acquired by a little practice.

L. E.—*Decimetres and Centimetres.* All through the article the word "decimetre" should have been written "centimetre." This is apparent by the "c.c." being occasionally placed alongside or within brackets. The main calculation is all right, but it must be remembered that *a thousand* cubic centimetres make a litre.

J. R. C. (Whitchurch).—*Lantern Transparencies.* Apply to Mr. Wm. Brooks, Wray Park, Reigate, or to Messrs. York and Son, Laucaster Road, Notting Hill, W.

J. D. (Glasgow).—*Albo-carbon Gas.* Surely there is au ageut in your town ; if not, apply to the Albo-carbon Light Company, Westminster, or to Messrs. Kent and Company, High Holborn.

THE PHOTOGRAPHIC NEWS.

VOL. XXXIV. No. 1686.—*December* 26, 1890.

CONTENTS.

THE YEAR 1890.

THE year now drawing to its close has been of a more eventful character than some of its predecessors in relation to the progress made by photography.

The diazotype processes are but a few months old, yet they are of such a novel character, and give such a power of producing photographs of different colours, that in time they are likely to be extensively utilised for various purposes. At present they are but in the experimental stage, but investigators are at work industriously examining their powers, and in time this research will bear fruit. At present all the pronounced colours of the spectrum can be obtained by the primuline process, but a satisfactory and durable green has as yet not been produced. In this process positive prints are produced from positive transparencies, and not from negatives; the process is likely to be of use for the production of reversed negatives for photo-mechanical processes.

Colonel Waterhouse has discovered, during the year, how to produce direct positives in the camera without long exposures; this is brought about by the use of thiocarbamides in the developer. The results have to be seen before the possible value of the discovery can be realised. Only a few weeks ago we saw some of the results in the shape of strong and brilliant transparencies; they were not imperfect images of no practical pictorial value. The action of sinamine instead of ordinary alkali in the developer might well be tried, but possibly it is not yet obtainable in the market. Thiosinamine, which is much used by Colonel Waterhouse, can be obtained from Germany through Messrs. Burgoyne & Co.; the purchaser would probably have to turn it into sinamine himself, should he desire to try the latter substance. Colonel Waterhouse says that at present there is a lack of certainty in obtaining the best results by his method.

The artistic side of photography is in a lively state. A new "school" of art is attracting attention; its members advocate more softness and less sharpness in photographs, and in the endeavour to obtain pleasing pictorial effects, care little for mere technicalities of any kind. The word "school" is a rather high-sounding term to apply to a few simple matters, still it is nice to begin to learn photography after buying a two-guinea set, then to let the hair grow long, dress in a velveteen coat and slouch hat, take pictures out of focus, and within two months to go about among one's friends as a member of a new school of photographic art, ready to do battle to the death for the new standard.

During the year photographic exhibitions have been increasing in number throughout the land. At the present time a first-rate one is open in Edinburgh, in which city the photographers wisely do not weaken their energies by holding large exhibitions too frequently.

Some new machine cameras have been invented during the year for taking several hundreds of successive pictures per minute, upon an endless band of sensitised paper or other fabric. These are likely to come into use in warfare, also in book illustration; they could be used for newspaper printing if a sufficiently inexpensive sensitive salt could be discovered.

The Camera Club and the Photographic Society are now moving into new premises of their own, the former in Charing Cross Road, and the latter in Great Russell Street, London. The Photographic Society is about to establish a library and a museum.

The larger manufacturing firms in photography are displaying a tendency to combine for mutual aid and protection; so also are the professional photographers; so also are the photographers' assistants. Some of the manufacturers have formed themselves into a section of the London Chamber of Commerce. In photographic, as in all other sections of society, the more highly educated the individuals, the more effective and powerful will be their organisations; and the lower the education of the individuals, the less effective will be their organisations, also the more will they split into sections, and the more will they waste time in squabbling over rules and petty points of detail. Good education and good organisation bear a distinct relation to each other, all other conditions being equal.

Great fluctuations in the price of platinum have taken place during the year. At one time the cost of

its salts rose to double that of a year or two ago, but the recent discovery of platinum in Australia has just brought the price down with a run.

An attempt has been made, and is now in progress, to introduce standard screws and flanges for lens mounts into general use. Photographs are much in need of this improvement, also standard hoods for lenses to take shutters manufactured by different firms.

Among the losses by death during the year, we have to mention the names of the Rev. T. H. Hardwich, Father Perry, Colonel Stuart Wortley, Mr. Baynham Jones, Mr. J. Solomon, Mr. T. J. Collins, and H. B. Berkeley.

PLATE CHANGING.

As the juggler casts a number of balls into the air, and they each rise to the highest point one after the other and then return to his hand, so the photographer has to adopt some means to bring plate after plate under the influence of his lens, so that Father Sol can set his seal upon them. In the old days of wet collodion there was little difficulty about the operation, for a single back—or, rather, rough box—was all that was required; but when dry plates came to the front the case assumed altogether another aspect. No one in his senses would go out armed with a single gelatine plate, so the double back arrangement came into vogue, and as it took up only the same space as the clumsy single back, it was speedily adopted. Excellence of manufacture became a *sine qua non*, for whereas a pinhole or two or a crevice did not excite the rather sluggish susceptibilities of the collodion plate, the dry material was of far too sensitive a description to be thus trifled with. And so it became the custom, by common consent, to supply each camera sold with its regulation complement of three double backs, and this arrangement has held its ground ever since as the most convenient which, on the whole, can be adopted.

But many other plans for bringing the plate under the action of the lens have been suggested and devised, and it is not too much to say that this single question of manipulating glass plates without allowing a trace of light to act upon them has engaged the attention of inventors perhaps more than any other problem connected with photographic apparatus. One of the first outcomes of this endeavour to conquer a difficulty was the production of the changing-box, one of the most successful forms of which was that designed by Hare. In this arrangement, the stock of plates—twelve or fifteen in number—was stored in a grooved box, and, by simple mechanism, each plate in turn could be transferred, by means of a special form of single back, to the camera. This was a capital form of apparatus when the operator knew that he would require to make a number of exposures; but the weight of the box for anything over half-plate size was considerable, and the invention failed to displace the more portable double-back. The same may be said of the multiplex back system, which had also much to recommend it. But, in this case, the weight of the apparatus, when charged with a dozen or more plates, became still more inconvenient, for the box and its load had to be attached to the camera when the picture was being taken. Another disadvantage accruing to this system was that the back of the camera must be rigid, that is, without that play which allows of a back or side swing. In certain cases, therefore, the use of the camera had to be abandoned, or the operator had to be content with a distorted picture.

The introduction of the hand-camera has again aroused attention to this important subject of changing plates with ease and certainty, and we may reasonably hope that, from the vast amount of ingenuity which is being brought to bear upon the matter, some permanent good will result. In some of the newer forms of so-called detective cameras, the plates are made to move from their magazines one by one, to turn from a horizontal to a vertical position, and resume their original place in a most obedient and wonderful manner. In many cases each plate requires to be placed in a special case, or sheath, before it is ready for the magazine. Other cameras, however, dispense with this preliminary operation, and we should, other things being equal, be inclined to choose a form of camera in which the plates can be slipped just as they are taken out of their original boxes; for previous manipulation means chance of stray light, dust, breakage, and other calamities, and it is best dispensed with.

The most perfect method of presenting a sensitive surface to the action of the lens is undoubtedly represented by the old panoramic device—two rollers, which wind out the material in lengths as required; but this naturally requires the use of a flexible web or film. Such films were made in days gone by by Melhuish—who devised the first roll-holder more than thirty years ago—by Woodbury, by Warnerke, and others. It has been reserved for the Eastman Company to produce a film and apparatus for actuating it which are really of a practical nature. But, for many reasons, glass plates will continue to be used by the majority of workers, including all whose daily employment is found under glass. And so the question as to the best means of changing plates remains an important one, and is, perhaps, best answered when the needs of each inquirer are known.

SECURING A "PLEASANT EXPRESSION."—It is an easy thing to laugh where there is something to laugh at; but when nothing funny has happened, laughing to order is a very different matter. The other day a certain German gentleman urged an amateur to photograph his two children when they were laughing. On a certain afternoon the amateur came with his camera, but on hunting up the children it was discovered that, while the little girl was quite willing to smile, the boy was in a very bad humour. In fact, the boy had just been punished by his father, and when he was asked to laugh never felt less humorous in his life. But the camera was there, and the father was set upon having the performance proceeded with. He repeatedly urged the boy, whose mouth did not get beyond a slight twitching at the corners. Then, becoming exasperated, the father shook his finger and exclaimed: "You laugh now, or I vip you again!" And under this awful persuasion the boy made an heroic effort.—ALEXANDER BLACK, in *St. Nicholas* for October.

CHRISTMAS PHOTOGRAPHS.

IT is a remark of the elder Pliny that the nature of man is greedy of novelty. In this respect Christmas is disappointing. Our Christmas—or, to speak more fashionably, Yule-tide—greetings have varied little during a very long time. The familiar stereotyped craving after another's "Merry Christmas," and an alien "Happy New Year," has lost much of its innate diguity and festive warmth. It is now commonly regarded as a forced formula of social politeness, or—so low has it fallen from its original high estate—a disingenuous demand for something to drink. Christmas presents probably owe their prolonged existence to the ingenious tradesman, who labels with this title at the present season everything saleable, from a patent cure for the cramp, to a stuffed crocodile. Christmas stockings are becoming rarer with the rolling years. The stocking of the oldeu time has been long considered, even by the infant understanding, a troublesome absurdity. Christmas trees and Christmas tracts still flourish in ever-green adolescence. Christmas mince pies and Christmas boxes are equally difficult to forget. These, like the poor, we have always with us, and the same may be said of Christmas bills.

It is high time for the photographer to be up and doing. It is for him to vary the weary and stale monotony of Yule-tide by a neat selection of Christmas photographs. These should be, of course, remarkable for congruity, taste, and truth. Absence of colour may, no doubt, be a stumbling-block in their way to popular favour, which, for some unexplored æsthetic reason, looks askance at this season upon monochromatic—and other sobriety. But this defect can, perhaps, be compensated by the elegance of their frames. They might chiefly consist of portraits and scenery. Both should be, except in the large cities, local. The curiosities, the "sights worth seeing," the cynosures of the guide-book, in every town should be put under contribution. In the smallest hamlet, the church, the market, and the hall—or whatever the squire may choose to call his house—would probably meet with some purchasers. Appropriate sentiments, pious or profane, in prose or poetry, must, of course, be deftly displayed on every photograph. The popular phrases of compliment, the well worn "With the compliments of the season," and "Wishing you a merry Christmas," in their multitudinous varieties, must be distiuctly legible. It is, indeed, this legend, or the portraiture of something intimately associated with the so-called festive time—such as a sprig of mistletoe or a mince pie, a piece of holly or a smoking hot plum pudding—which forms the characteristic difference between the Christmas card and the Easter card, the New Year's card, the birthday card, and the valentine. To all these, also, there is no reason why photography should not be applied.

One advantage will be certainly gained. Our Christmas photographs will be representations not of ideal fancy, but of actual fact. In a season of so much sincerity of genuine affection and real benevolence, a needless note of discord has ever seemed to be introduced by the portraiture of much that is altogether inconsistent with truth, or at least with adaptability. Such, for instance, are the pictures of young ladies, with next to nothing on them, playing at skipping-rope, or curiously contemplating a bowl of gold fish. These insufficiently attired females are, it is said, known in the trade as "youthful beauties." In spite of the preposterous unsuitability of their scanty raiment to the frost and snow of winter's reign, they appear to suffer no kind of inconvenience, but disport themselves as though in the sultry sunshine of a midsummer noon. Fair, indeed, they are, but false; incarnations of inconsistency and fraud. False, too, and fair are the presentments of the butterfly, an anomaly in December, and of the heartsease, a darling of June. With these the Christmas photographer will have naught to do. He must also, though this is a matter deeply to be deplored, carefully eschew guardian angels. By so doing he will, indeed, lose fruitful and frequent opportunities of gain, for there is a large section of the public to which these anatomical monsters appeal with peculiar and exclusive force and urgency: but the field of nature is wide, and he will have enough to satisfy him and to spare, without the introduction of a physiological caricature, or of that almost equally objectionable and unprofitable picture of the cock robin everlastingly connected with Christmas, and the cottage buried in snow.

Perhaps the most suitable scenic subjects for Christmas photographs would be representations of nature as she commonly appears in the month of December. Out of the many variations effected by frost and snow, the cunning photographer may make some of his sweetest music. Failing these, he may try his hand at the brooding terrors of the storm, or the winter tempest fermenting in the evening sky.

Next to these subjects in importance is individual portraiture. At a time of general peace and good-will to men, the photograph of a friendly face must surely be a more desirable present than the similitude of a fat turkey; a group of children of a neighbour—children not occupied with the nuisance of snowballs—than a cat, a brandy bottle, a plum pudding, or a goose. People are wont to write their names on the Christmas cards, which they sow broadcast with a liberal hand, partly to remind the donees of their benefactor, and partly from a pleasing reflection that such cards cannot again be sent by these donees to other people. Instances have, indeed, been known of persons who have neglected this salutary precaution receiving, after several transmigrations of their pictorial contributions through fashionable society, and after many days, their own cards back again. The Christmas photograph, on the contrary, would bear on its face the face of him who sent it, or of his family, and would have no meaning if forwarded onwards, like a bad shilling, to a stranger.

There is another advantage which, though chronicled last, is not least in the Christmas photograph. Though the ingenuity of mankind is marvellous in the manufacture of mischief, it is not easy to see how our Christmas photographs could be degraded into expressions of cruelty and insult. That the pretty custom of valentines has considerably suffered in this way, will be tolerably obvious to anyone who will walk through some of the minor and less polite streets of our metropolis towards the middle of February. He will find, to his dismay, that the holy day of the saint who is the patron of actions of charity, benevolence, and love, is now an opportunity greedily seized of anonymous abuse and indecent obloquy. All that the exacerbation of hatred can suggest of ugliness, all that the hand of the uninstructed dauber can execute of deformity, in colours rude as the conceit which presided over its birth, is to be bought for a penny in commemoration of this Christian festival. Christmas cards are becoming subject, alas! to a like degeneration. The picture of a donkey, preceded by the words "From one,"

and followed by "to another," has less of politeness than pungency, though it possesses very little of either. The carefully simulated semblance of a cheque, or of a purse full of gold, is a poor piece of waggery at the best, but must be doubly distressing to the recipient wight who is in sad want of one or both of these rare gifts of fortune; of the reality and not the shadow; and how few of us are not!

Widely different from such pictures as these, and far more really congenial to the spirit of Christmas—not, as it is commonly understood, a season of guzzling and the gratification of the palate, an entertainment so far removed from moral or intellectual happiness that the common consent of mankind has not hesitated to brand it as the lowest of our sensual delights, but a season of sympathy and beneficence—would be a reproduction of some of the works of the master painters who have illustrated this time, or a photograph of living children in the sad livery of poverty and distress—the raw material of our social manufacture—tricked out with no meretricious glow of colour, but a simple symphony of black and white appealing to the ear of the truly Christian heart.

THE HACKNEY PHOTOGRAPHIC SOCIETY, Morley Hall, Hackney, will hold the following meetings:—January 8th, collodio-bromide, Mr. A. Mackie; January 22nd, American lantern slides; February 12th, "Norway," illustrated lantern lecture, Mr. Henry Sturmey; February 26th, lantern evening.

A PHOTO-ASTRONOMICAL OBSERVATORY ON MOUNT ETNA.—*The Corriere di Palermo* sets forth that several years ago a new observatory was built on Etna (at a height of 3,000 metres) through the activity of Professor Tacchini, and the approval and help which the project found in Catania. Professor Tacchini, recognising the necessity that the Observatory at Etna should be joined with another, that it might work with greater regularity, succeeded in inducing the Government to build and organise the observatory connected with the University in the town of Catania. This institution is destined principally for the study of astronomical physics, for celestial photography, for meteorology, and for seismology. Direct astronomical and spectroscopical observations will be made for the most part in the upper story of the Observatory with the great refractor, which has an objective of 35 centimetres in aperture and $5\frac{1}{2}$ metres in focal length. It was made by the celebrated Merz at Munich, and the equatorial mounting was executed by the able mechanician, Caviguato, of Padua, under the direction of the astronomers Lorenzoni and Abbeti, of that town. Other observations will be made with the equatorial of 15 centimetres in aperture, constructed by the renowned American, Clark, to which an apparatus can be added for the photographing of stellar spectra. This instrument will be placed in the garden of the Observatory, liberally given by the Municipality of Catania. In the same place, in a suitable pavilion, will be fixed the photographic telescope, with an objective of 33 centimetres in aperture. This was constructed by Steinheil, and the mounting was made under the direction of Professor Tacchini in the premises of the clever mechanical engineer, Salmsiraghi, at Milan. With this instrument the Observatory at Catania will take part in the great international enterprise of preparing photographic charts of the stars. In the same garden the apparatus of Huggins will be set up, which serves for the photographing of the solar corona. Besides, at the Observatory on Etna, there is an equatorial equal to that of the great refractor; and to this it will be possible to apply the same objective of Merz, and another which, for special observations, astronomical and physical, will be taken to the volcano. Observations in meteorology will be made, some in the upper story of the building, where the apparatus of Mascart for the photographic registration of atmospherical electricity will be worked. Professor Riccò has been appointed regular Professor of Astronomical Physics in the University of Catania, and Director of the two Observatories. He is a member of the International Committee for photographing the stars.

THE CAMERA AND ITS VARIOUS MOTIONS.

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

CHAPTER III.—THE SWING-BACK—THE SLIDING FRONT—THE REVOLVING FRONT.

IN a set of papers on "Optics for Photographers," published in the PHOTOGRAPHIC NEWS, I went so far into detail in connection with the theory of the use of the swing-back that I think a very few words will suffice here.

The vertical swing may be either from the lower edge of the back of the camera, or from the centre. The former is far the commoner arrangement, but the latter has distinct advantages, not in those cases where the swing-back is used merely to secure vertical lines in architectural subjects, but where it is used to bring the foreground into focus as well as the distance.

We generally focus for the middle of the ground glass, or for some part not *very* far from there. Now if we have so done, and then come to the conclusion that it would be of advantage to use the swing-back to bring the foreground into focus, if the back swings from the bottom the effect of swinging it is to put everything out of focus; we have to focus again, and it is only after a somewhat troublesome series of focussing and swinging that we can decide by trial and error that we have swung the back to just the right extent. When the swing is from the centre the thing is quite different. Having once focussed for something not very far from the middle of the plate, we simply swing the back till the foreground comes into as good focus as we can get it, this operation not putting the part first focussed for out of focus, or doing so to only a very slight extent.

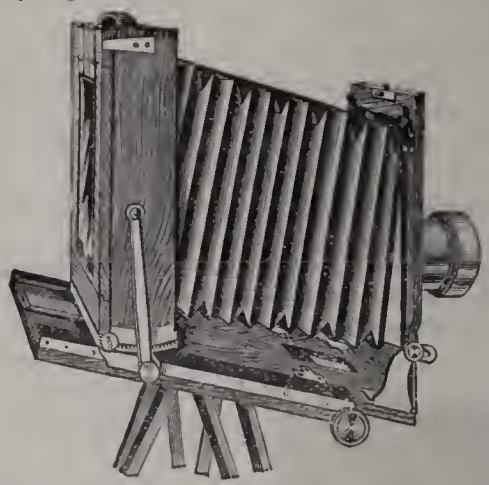

Fig. 7.

The camera of Mr. J. R. Gotz, illustrated here, may be taken as one typical of a camera with back swinging from the centre. The camera is a very ingenious piece of mechanism in many respects.

The fact is, however, that, as regards swinging the back merely to get different parts of the subject into focus at the same time, this should be less practised than it is. It is commonly supposed that, so long as there are no vertical lines in a picture, from houses or the like, any amount of liberty can be taken with the back of the camera. It is quite true that where there are no vertical lines it is often permissible to tip the back of the camera backwards to a certain extent; but if this be done more than a little, the drawing, even of a "pure landscape," may be made perceptibly false. Especially in the case where mountains are included in a landscape should the tipping

of the camera back be avoided, and this is just the case where there is generally the greatest temptation to tip. There is often a wish to tip the whole camera, so as to get in the top of the mountain, and there is sometimes a wish to still farther tip the *back*—or to swing it—so as to get the mountain and the foreground into focus at the same time. There cannot be the smallest doubt that the tendency that there is to the *dwarfing* of mountains so commonly seen in the case of photographs is, at least in a great part, due to the mischievous tendency that there is to the tipping back of the ground glass and the plate, for it must be borne in mind that the effect of such tipping is to diminish the scale of the upper part of the picture *relatively to the lower*. I think it is not too much to say that, in the case of mountain photography, the verticalness of the back of the camera should be as religiously observed as in the case of the photographing of buildings.

A case in which the swing-back is particularly useful is that sometimes met with in which the camera has to be tipped *downwards* to take in a near foreground.

Of the side swing the same may be said as of the vertical swing, so far as the desirability of having the swing from the centre rather than from one side goes; but that, inasmuch as the side swing is comparatively so seldom used, the matter is one of much less importance than in the case of the vertical swing.

The smaller the size of a camera, the less the necessity for a side swing, and indeed for a vertical swing, except for getting vertical lines parallel. I think the side swing may very well be dispensed with in the case of all cameras from half-plate size downwards.

Sliding Fronts.—The power of sliding, and especially of *raising* the front is a very useful one, but really, in its simplest form, needs no explanation. I will here only emphasise what has several times been pointed out by Mr. W. E. Debenham, namely, that if the lens will allow of it, the front should be raised as far as possible, when photographing high buildings, before recourse is had to tipping up the camera and swinging the back. A somewhat more complicated form of sliding front is described in the next paragraph.

The Swing Front and Revolving Front.—Both these adjustments were brought prominently before the public some six or seven years ago, when the camera invented by Mr. S. D. McKellen was first exhibited. This camera displayed so many ingenious novelties that it at once recommended itself to the public, and became one of the most popular cameras that there are. The illustration here given will serve to illustrate the swing front. The motion, it will be seen, is simply a vertical swing. It is useful chiefly to bring the front of the camera parallel with the back, when the camera has been tipped and the back has been swung, and a little consideration will show that, as such, it amounts in reality to an almost unlimited power of raising or lowering the front. In the case of all cameras introduced before the McKellen, the amount of the rise of the front was very limited, and although in the case of most cameras generally sufficient, was not as great as was desirable for some special work. Moreover, in the case of many forms of camera, the bellows is liable to cut off a part of the view if the front be raised as far as possible. This is rendered impossible in the case of the McKellan camera, by the fact that the end of the bellows is *raised with* the front. This will be understood from the above illustration.

Fig. 8.

The introduction of the swing-front (or, more strictly, of the extension of rising power given by it) first made a *revolving front* a useful addition to landscape cameras, and this adjustment was added by McKellen. It is illustrated here, the particular camera shown being that known as the "Thornton-Pickard." The advantage of the revolving front is that, if the lens be fixed *excentrically*,

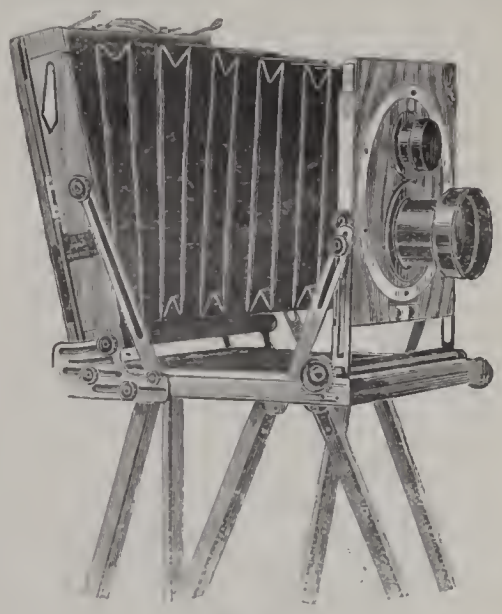

Fig. 9.

a universal motion is added to all others by the combined use of the revolving front and the rising front. The advantage of the revolving front is not great except for large cameras, as, in the case of small ones, the diameter of the flange of any lens likely to be used is nearly as great as that of the front, so that only a slight amount of excentricity is possible. In the case of large cameras, however, it is considerable, and it is even possible, in some cases, to fix two or three flanges for different lenses to the same front, as shown in the illustration. In this case, any one lens can be brought into any desired position by the combined motion of the revolving and rising fronts.

Many of the improvements first introduced by McKellen have been copied by other camera makers in a way that does more credit to their powers of imitation than to their originality.

A NEW INTENSIFYING PROCESS.—Dr. Liesegang thus deseribes in the *Archiv* a curious new process for intensifying weak negatives:—The finished negative is coated with a collodion or varnish in which has been dissolved a portion of some one of the green or red aniline dyes which are sensitive to light. It is then exposed to light for some time, this being allowed to act on the dye *through* the negative. The clear portions are thus bleached out, while under the darker parts of the negative the dye remains unaltered, and hence brings these up to a greater density. Unfortunately, the aniline dyes cannot be made non-sensitive to light, hence the effect vanishes in the course of extended printing from the negative. In place of the aniline, however, a salt of iron may be used, developing afterward as in the "Lichtpaus" process. This last intensification is, of course, permanent.

SOME OF THE TENDENCIES IN PHOTOGRAPHIC ART.*

BY PHILIP H. NEWMAN.

AND now, having lightly touched on a variety of classes of exhibits in this Pall Mall show, it is time for me to direct your attention to that which I conceive to be one of the most important, if not quite the most important, subject for our consideration, and wherein, I think, a decidedly epoch-making departure for good or bad must be admitted—I, of course, allude, as you will have guessed, to the medalled exhibits of Messrs. Davison and Clark. The work of these gentlemen is always brave and conscientious, and worthy of the greatest respect, and in this particular instance their exhibits are highly deserving the awards the Society have given them. But while admitting that the works are in one direction a very great success indeed, I must demur to the success being in the direction that is generally supposed. Messrs. Davison and Clark are artists, artists of the camera if you will, but that is an accident; did their practice lead them to use any other medium as a means of expression they could not help being artists, even if their technical results were not so successful as in the art of photography. Now the general belief is that the works, "Dedham Lock," "Dedham Bridge," and the "Old Farmstead," owe their charms as much to the merits of the printing processes employed, and the accentuation of an out-of-focus motive, as to other characteristics; but it is precisely here that we must distinguish between success and failure. The choice of subjects, composition, and all that technical excellence can give, with one exception, are eminently pleasing and satisfactory, promising artistic and interesting pictues; but this exception in their negatives, emphasised especially in the case of Mr. Davison in his printings, indicated that these gentlemen have thrown away the substance, so to speak, for the shadow, and are satisfied by a result which, because it gives a more or less close resemblance to a second-rate sepia drawing, is deemed artistic.

But I think I hear you say: "Oh! don't you like rough paper, then, and fuzzy prints, and sepia tones?" "Personally, I do like the rough and fuzzy effect. I will allow that my idiosyncrasy is better satisfied when my eye has some artistic work to do, and has to complete for itself a more or less well-defined image. Moderately near-sighted people are favoured in this respect, and perhaps that is one of the reasons the projected enlargement on the screen of a photographic picture gives me far greater enjoyment than any printing process has ever done, mainly, I say, because of this work the eye often has to do in such a case. I shall have occasion to speak further on more particularly of screen enlargements, and will return, for the moment, to fuzziness in prints and rough paper, which, though I have said that I liked, I now desire to make myself clearly understood by adding that, as with every other artistic attribute, I like it in its proper place, without which I emphatically deny its *raison d'etre*. The roughness or smoothness of surface of a work of painting, printing, or photography, is simply a question of scale; argue the matter out as you may, it always comes to that.

Let no one persuade you to the contrary, the use of a rougher paper than the area of your print justifies is an affectation and a sin against good taste. That you may be the more readily convinced that this dictum is neither arbitrary nor empirical, let us look at the subject for a minute or two from a very common-sense standpoint, and I will ask any one with ordinary eyesight how far he places a photograph or other object from his eyes when he is looking at it for ordinary purposes, viz., to be pleased or refreshed by its artistic suggestion, or the memories it may recall. I say its ordinary purposes? I shall be answered, the distance referred to is generally rather less than twice the length of the greatest diameter of the work under inspection. This being so, I will further ask the person inspecting the work at that ordinary distance if he, or she, desires to see the undulations in the texture of the paper or surface before or simultaneously with the subject under view; whether the ribs and marking in the structure of that paper, or surface, contribute in any degree to the enjoyment of the picture? No, I shall be generally answered, not at all, but rather, that the lines and markings militate against that enjoyment, distract the eye, and withdraw in some measure the attention from the picture, or subject, whatever it may be. I may be asked to be more precise as to the proper distance to view a work of art with fairness to the artist and enjoyment to one's self. I can only say—always subject to variable idiosynerasy, of course—that that distance will be approximately given by double the altitude of an equilateral triangle constructed on the greatest height, or width, as the case may be, of the work to be looked at; and I repeat that any paper, or canvas, whose texture asserts itself, and can be distinguished equally with the work printed, or painted, upon it at the distance I have mentioned, is in bad taste, and, indeed, a barbarism and an affront. Who, I ask, but the most ignorant person would think of printing a carte-de-visite on very rough paper? Who but a most affected or ignorant person would pretend to be satisfied with it? When done, should we derive any satisfaction from the works of Teniers, or Gerard Don, had they been painted on brickbats or sandpaper? Would the pictures of Peter de Hooghe, Van der Heyde, or other painters of detail charm us did we see the lines in the canvas falsifying, by their light and shade, the drawing in their work? Of course the reverse of the proposition holds good, and we are none the less displeased with a smooth, hard surface in a large wall painting or fresco. Roughness or granulation here gives life and brilliancy, and, at the same time, a sense of vagueness, which the eye is doubly charmed to correct for itself, and complete our artistic satisfaction. Roughness of surface, then, is, as I have said, a matter of scale in all cases, and a scale which we must naturally apply to the works in the recent photographic exhibition, and I fear very much in their disfavour; for on the application of the test I have mentioned, we shall see the structure of the paper in many instances asserting itself before we have time to enjoy the pictures. I am compelled to dwell particularly on this in a paper addressed to a society of amateurs, and treating on some of the recent tendencies in photographic art, because where professors have been in error, amateurs are most likely to stumble.

Now it is, of course, interesting to see such a very successful work as Mr. Davison's pinhole picture, but it must be remembered that if the rule of scale applies to roughness of paper proportionately with the size of the work, to be consistent, it must equally apply to vagueness of outline from any other cause; indeed, such as the pin-

* Continued from p. 983.

hole gives. The question then arises, does Mr. Davison's pinhole picture justify this vagueness in point of size? I am afraid we are driven to the conclusion that it does not, and quite apart from the considerations of whether, under any circumstances, excepting the necessity of the case where a lens is not obtainable, or for an experimental *tour de force*, a pinhole is desirable at all, or whether, in the nature of things, it is desirable to have photographs excepting of limited dimensions. It is more than questionable whether fuzziness is not entirely out of place, excepting in very large scenic work in landscape, and only tolerable in photography at all in life-sized portraiture. But, because of this very desirability of fuzziness in the life-sized head, it must be the less desirable in the much smaller scale of the landscapes we are speaking of. All praise to Messrs. Davison and Clark for their choice of subject, composition, lighting, skies, and so forth; but we cannot thank them for works on a limited scale affording no point of sharp focus for the eye to rest upon. Assuredly the works of these gentlemen, however successful they may be in one respect, distinctly fail in another, and which I point out as being based on an artistic misconception, and against which every amateur should be warned.

I have gone so far, it will be remembered, as to make use of the phrase, "throwing away the substance for the shadow," and I think it must be allowed advisedly, when we consider that one of the greatest charms of photography, its greatest boast, and, indeed, that in which no other art ever has, or ever will approach it, is in the veracity of its delineation of detail. This charm is surely a substantial one, and it must be asked why photographers should seek by any means to divest their work of it in the shadowy hope of rivalling that of a painter's handling, that individual charm by which genuis, making dexterous use of accidents of stroke and flow of colour, fulfils its bent unfettered, and with the least material interposition between the artist's brain and brush.

That handling we love so much to linger over in the pictures of the old masters—touches that make the dead past live again, touches which wake our souls to sympathy with those whose works shall be immortal, because their touches show for ever their souls within their works. I say that, to try to effect this by means of the camera is to endeavour to lift it from its true position. to give it another *metier*—in short, unworthily to follow in the fatuous footsteps of the fabled frog, and burst in envious emulation. Results such as the camera, or any photographic process can ever give, can in the nature of things never affect us in the same way as those of the pencil, the graver, or the chisel. Photography has its own proper and special fields, and it is a needless prostitution of its legitimate aims to endeavour to make it subserve the imitation of another art.

(To be continued.)

A SUPPLEMENT TO THE PHOTOGRAPHIC NEWS.

Next Friday we shall issue, as a supplement to this journal, a photogravure print of Mr. Lyonel Clark's photograph of Dedham Bridge, which won a prize at the last Exhibition of the Photographic Society. The supplement will be a good work of art; in fact, a companion picture to that of Kingsley's Rectory, which gave so much satisfaction when we issued it some months ago.

THE PROPOSED PHOTOGRAPHIC INSTITUTE.

Recently the under-mentioned members of the Council of the Photographic Society, with Mr. K. B. Murray, Secretary of the London Chamber of Commerce, accepted an invitation from the Lord Mayor to lunch at the Mansion House, and discuss the question of the proposed Photographic Institute:—James Glaisher, F.R.S., Captain W. de W. Abney, R.E., C.B., F.R.S., William England, H. P. Robinson, Dr. Lindsay-Johnson, J. Gale, Sir Henry Trueman Wood, M.A., W. S. Bird.

The Lord Mayor gave courteous consideration to the statements put before him as to the important and constantly extending applications of photographic science and art; as to the recognition of the value of these applications manifested by France, Germany, and other countries in the establishment of schools and institutes of photography maintained by the State; and as to the desirability of steps being taken to found in London an institute for the encouragement of photographic research, and for the perfecting and practical teaching of photographic processes. It was stated that the Photographic Society of Great Britain was desirous of initiating and supporting such a scheme if there were any likelihood of funds being forthcoming. The Lord Mayor was of opinion that a movement in this direction was desirable, and that a well-considered scheme would have his support; that any large amount of money—as, say, £40,000—was, in his opinion, not likely to be subscribed in the City, but a fourth of that sum might be, and kindly promised to call a meeting at the Mansion House, and to preside at it, if proposals were put before him during his tenure of office.

It was decided to refer the question to the following committee:—Sir H. Trueman Wood, J. Gale, K. B. Murray, Dr. Lindsay-Johnson, and W. S. Bird.

The committee has drawn up a report, the text of which is here quoted from the *Journal of the Photographic Society*. It is proposed to take an opportunity of discussing these suggestions at the December meeting of the Society.

The Photographic Institute.

The committee to which was referred the task of formulating a scheme for the proposed Photographic Institute has now the pleasure to submit to the council of the Photographic Society of Great Britain the results of its considerations. It understands that the principal object of the Institute would be to promote the science, art, and industry of photography; and it thinks that the following is the best course to be adopted for the purpose. The heads under which its action would come may be classified as—(1) science; (2) education; (3) art; (4) industry.

1. *Science.*—Its principal duties towards the science of photography would be the encouraging of original research, to be applied both to the investigation of new, and the improvement of existing processes. It might undertake such researches through its own staff, and would offer facilities to others, either in the form of grants of money, or by providing suitable laboratory and other accommodation. Full provision should be made for the systematic examination and testing of photographic apparatus and materials. Possibly by its aid prizes might be offered, and every other means should be adopted to encourage the advance of photography, its application to scientific purposes, and the advance of those sciences which bear upon it.

2. *Education.*—It should provide for theoretical and

practical instruction in all sciences bearing upon photography, in photography itself, and in all the branches of applied photography. For this purpose, lectures would be given, classes held, and regular courses of instruction provided, including laboratory work, and the technical details of all the various photographic applications, especially the photo-mechanical processes. It would hold examinations and grant diplomas and certificates, the course of instruction and the character of the examinations being such that the one would qualify persons to undertake any of the several branches of photographic industry, while the latter would be looked upon as a test of proficiency on the part of employers, and thus secure a preference in employment to successful candidates. Nor should the instruction omit the teaching of art in its bearing on photography. Probably it would be desirable to found travelling and other scholarships. The Institute would be expected to establish a first-class library, and to form a museum both historical and scientific.

3. *Art Exhibitions.*— Its principal duties connected with the art side of photography would probably consist of the holding of exhibitions. These might be both national and international. It might also occasionally be found desirable to hold international congresses.

4. *Industry and Trade.*—As regards the effect of the Institute upon the industrial departments of photography, it would be expected to provide assistance and information for all connected with the business of photography, whether as photographic artists, manufacturers, traders, or others. It would be competent to deal, in the first instance, with such questions as photographic copyright, patents, trade-marks, and merchandise marks. In all cases it should be ready to safeguard the interests and promote the welfare of the many industries resting on photography as a basis.

In order to carry out its duties fully, it would be necessary that a charter of incorporation should be obtained, and suitable premises provided, with all necessary fittings and apparatus. The accommodation which would be required must, of necessity, include the following:—An exhibition gallery, a conference or lecture room, library, museum, class rooms, laboratory, studios, dark rooms, and printing rooms; while among the work rooms would be included some properly fitted for the carrying out of such processes as collotype, Woodburytype, and the different photo-typographical process. In addition to the above, the building would, of course, include the necessary offices. To carry out such a scheme in its entirety would require, no doubt, a sum of from £4,000 to £5,000 a year, together with a capital outlay of some £10,000 or £12,000. The sources of revenue which might be looked for include donations and bequests, subscriptions from members and affiliated societies, fees from students, charges for experimental work, and the rent which might be obtained by hiring out the exhibition gallery and the meeting room. A useful beginning might, however, be made with a much smaller sum, say a total amount of £10,000 guaranteed, if not subscribed. For this, no doubt, suitable premises could be secured, and the maintenance of the Institute provided for a period of seven years. At the end of that time, it might be hoped the public at large would be convinced that the Institute had become a necessity, and would be willing to provide funds for its permanent support.

If the suggestions of the committee recommend themselves to the council of the Society, the committee would further suggest that the project might well be discussed at a meeting of the Society, after which it might be submitted in the form of a circular letter to the different provincial societies; and if the favourable opinion of the photographic public generally were once gained, the committee think that the Society might then well avail itself of the most liberal offer made by the Lord Mayor of London, to summon a public meeting at the Mansion House for the discussion of the proposals. In making this suggestion, the committee hope that if, as is probable, the matter can hardly be brought into a state ripe for public discussion before the termination of Sir Henry Isaac's mayoralty, they may look for the same support from his successor in the chair.

Literary Notices.

Photography for Architects. By F. W. Mills. (*London*, 1890: *Iliffe and Son.*)

This is a book for beginners, for it assumes that the reader knows nothing about photography, and opens by minute descriptions of simple details, such as explaining the use of the different parts of the camera, and informing the student that if he wishes to diminish the image of a building he must plant his camera farther away from it, but if he wishes an enlarged image he must place the camera nearer to the object. The book contains little about architects or architecture, but includes a chapter on the photographing of interiors, also a chapter on the copying of plans and tracings by the ferro-prussiate and other suitable processes.

One of the processes given is Portwin's, which is thus described:—"The paper is first floated on a warm solution of gelatine (1 to 15) to which some suitable pigment has been added. When dry, it is sensitised by immersion in the following simple solution:—

Ferric chloride	... 480 grains
Tartaric acid	... 144 ,,
Water	... 10 ounces

The paper is dried in the dark. The effect of the action of light is to convert the ferric chloride into ferrous chloride in those parts on which the light has acted, thus rendering the gelatine coating soluble in hot water, where it is in contact with the ferrous salt. It will be seen, therefore, that a reversed positive is necessary to yield a positive print. When sufficiently printed, the image is developed by simple immersion in hot water. The insoluble parts remain in the paper and form the image. The great drawback to the process is the necessity for printing from reversed positives; but it is probable that this defect may be remedied."

The author has had some strange experiences with the east wind, or the east wind has had some strange experiences with the author. The latter says:—"When there is an east wind make the exposure half as much again as that advised in the table."

The work is likely to be useful to beginners. Mr. Mills does not trouble his readers with too many formulæ, but seems to have limited himself to a few which have answered in his own hands. He recommends a quinol developer for plates exposed on interiors, and does not trouble his readers by describing any other. He says that he has found ferrocyanide of potassium in the developer to prevent frilling and blisters.

THE PICTURES AT THE EDINBURGH PHOTOGRAPHIC EXHIBITION.—III.

Class III.—Portraits Below Whole-Plate Size in Sets of Twelve Direct Prints.

In this class the "cabinet" reigns supreme, and a truly regal display they make; platinotype is the favourite mode of printing.

With our present knowledge it is difficult to imagine where or how the next step in progress can come in this universally popular size of portraiture. In purity of high-lights, in depth and richness of shadow, in delicacy of half-tone, improvement can scarcely be hoped for. The competition in this class is keen, and it is not an easy matter to single out what may be considered the most worthy of notice, lest unwillingly, or by some oversight, an injustice be done. Perhaps the alphabetical order for the more prominent will be advisable.

Alex. Ayton, jun.—The work of this exhibitor is specially remarkable for its brilliancy combined with softness. The blacks are rich and velvety; the whites are pure and sparkling, without the faintest suggestion of hardness, as each portrait has every grade of tone. The lighting is specially pleasing; the pose most natural; the children are all child-like in pose and expression, being free from all appearance of artificiality. Mr. Ayton's work is of a high order. His large heads are of lovely subjects most sympathetically treated; his children simple, natural, and sweetly beautiful.

John Moffat exhibits a remarkably fine frame of portraits much above the average. His work is, technically, of the highest order, and he secures a piquancy of expression and pose that is very pleasing. There is one of a young lady leaning out of a rustic window that is extremely charming.

Marshall Wane.—The work shown by this exhibitor is of the highest order; brilliant without hardness, soft without flatness, the pose and lighting thoroughly good.

Wane and Allan.—These portraits are by the same firm, and are similar in character to the last, but there is a special softness and delicacy about the exhibits under this name, while the pose of the subjects is markedly natural and free from all strain. They have an ease and grace not too commonly seen.

William Warneuke exhibits a dozen gelatino-chloride prints. They are most exquisitely soft and tender portraits of children charming alike in pose and expression. One especially may be noted. It may be called a procession of three half-length figures, none overlapping, with piquant little faces all in profile: yet there is a perfect unity, brought about by the attention being concentrated on some one object of interest not visible. There is a peculiar charm and originality about this.

W. W. Winter.—This frame of children's portraits (No. 552) is one of exceptional merit. Its distinctive characteristic is the felicitous grouping. In this respect Mr. Winter's work is distinctly prominent, and when to this is added appropriate expression and excellence in *technique*, it makes his contribution one of the most attractive in the rooms.

J. Macmahon sends a fine display of children and adults, delightfully soft in lighting and simple in pose.

J. H. Hogg shows capital work.

R. Slingsby contributes a number of flash-light photographs. Perhaps the highest compliment that can be paid them is that if they were not so labelled, few would be aware they were not taken in ordinary daylight.

J. M. Whitehead, W. J. Kilpatrick, Stanley Hurst, Jamieson & Co., J. M. Whitehead, J. Pettigrew, and E. Y. Poole also send meritorious work in this class.

Class IV.—Portraits, 8½ by 6½ up to 12 by 10 inches, in Sets of Six Direct Prints.

This division has not brought forward so many exhibitors as might have been expected, but the quality of most of the work sent is of a high order.

Ralph W. Robinson sends a set of his "Artists at Home." They have a character all their own, and stand apart from the rest. His work is well-known from previous exhibitions. Among the most prominent of these beautiful studies may be noted the portraits of W. Q. Orchardson, R.A., John Reid, P. H. Calderwood, R.A., and Marcus Stone, R.A.

J. G. Tunny and Co.—No. 699. Three lovely heads, simple and graceful in pose, the lighting very pleasing, and under No. 713 will be found a most charming head of a beautiful child exquisitely treated.

Alex. Ayton, jun., is capitally represented in No. 564. It represents a lovely child naturally posed, the draperies and flesh tenderly delicate, and a rich, broken background of furniture and foliage. Mr. Ayton also sends some large heads with all the qualities of his work noted in Class III.

Marshall Wane.—Of this exhibitor's work, we prefer No. 716, "Provost Brown." This is a particularly fine portrait, rich in colour, and well composed. Portraits of the Earl and Countess of Hopetoun (Nos. 702 and 639, and also No. 319) would have been greatly improved if more space had been allowed above the heads. Nos. 637-8 are free from this defect; they are clear, brilliant portraits full of delicate modelling.

Jamieson and Co.—In No. 206 this firm excels all the other work they have sent. It is a startlingly brilliant full-length of a lady in white satin, near white curtains. The management of the light is remarkably effective, and while intensely brilliant, it is entirely free from hardness. No. 723 is also meritorious.

Messrs. Window and Grove send two frames representing characteristic portraits of well-known actors and actresses. The most effective seem to be those under No. 257, which are printed in silver; they are exceeding rich in colour, and possess fine quality.

John Macmahon sends a series of well-executed portraits of professors and others; also a capital family group (No. 220).

Mrs. Brian Hodgson, S. N. Bhedwar, C. G. Bremner, and R. R. Russel also send interesting portraits.

X. Y. Z.

Another Professional Use of Photography.—A marriage broker is said to be doing an excellent business in Bachmut, Russia. Anybody coming to Bachmut is sure to be met by this man at his hotel with the inquiry, "Sir, do you want to marry?" The marriage broker carries an album full of photographs of people of both sexes who would not mind getting married. On each phototograph may be found details concerning the social and financial standing of the person pictured. On his arrival at Bachmut, the broker visited every house of interest to him in his especial line, and was kindly received everywhere. There are already many happy brides and grooms in the city to whom he points with pride as his customers. Bachmut is especially favourable for operations of this nature, it is said, as it contains many girls of good looks and fair fortunes.—*Photographic Times.*

Notes.

The Camera Club has altered its rules in regard to subscriptions. The annual subscription after the first of January next will be raised for town members to five guineas, country members two guineas, foreign members one guinea, with an exception in favour of the *first* hundred members proposed and elected after the first of January, for whom the town subscription will be only four guineas. For members proposed before the first of January the present subscription will hold, namely, three guineas for town, and one guinea country members.

Of all employers of labour in photography, Mr. John Carbutt, the American dry plate maker, seems to be one of the most popular among his assistants. When he reached his works after his return from his recent visit to Europe, he found, confronting him in his office, a large and handsome floral device, with "J. C." in the centre, and surrounding those letters the following sentence: "The heartfelt expression of the work-people —Welcome home!" The lettering was composed of small red, white, and blue flowers; the whole device was about four feet high, and rested upon a bed of roses. The following week the assistants were surprised at receiving double their usual salary. The work-people thereupon drew up and signed a written testimonial speaking of Mr. Carbutt's many virtues, and expressing the hope that the amicable and harmonious relations existing between him and his work-people may long continue. Mr. Carbutt took back with him several specimens of European cameras, and exhibited them recently at a meeting of the Philadelphia Photographic Society.

A good library tends to increase the prosperity of most scientific organisations, for there are plenty of people who care to possess ready access to a good lending library on class subjects, who do not care to attend public meetings. It is remarkable that several photographic societies have no library, or have some uncatalogued books stored away practically beyond the reach of the members. Even the smaller societies might invest in a box with lock and key, for the storage of books, and start a library by means of photographic books given by its members. It is a wonderful thing that the Photographic Society itself did not long ago take this bold and spirited course; next year, however, it will make a beginning with a library and a museum.

The problem of staining sensitive photographic surfaces to prevent halation now seems to be again attracting attention, and it would be exceedingly convenient if by this method the backing of plates could be avoided. Twenty years or more ago Mr. Carey Lea tried a series of experiments on this subject, and the substance he found to answer best for the purpose was litmus, with the faintest trace of acid to give it a red colour. In the alkaline developer the litmus turned blue, and more or less dissolved out of the film, so nothing was left to interfere with the printing qualities of the negative. The trace of acid in the first instance would probably slow the plate. At the last meeting of the Camera Club the cosines were spoken of as good for the purpose, but one speaker gave a poor account of their action, saying that some slowed and others fogged the plates.

Mr. F. Galton's idea of the comparison of photographs of the same person taken at different periods, from infancy upwards, is slightly indicated by an article with illustrations in the new *Strand Magazine* entitled, "Portraits of Celebrities at different times of their lives." The examples given are, however, only interesting from the point of view of that unscientific person, the "general reader." For instance, the comparison of a photograph of Lord Tennyson at fifty-two with a painting of the poet at the age of twenty-two tells us very little, nor can much be said about three portraits of Professor Blackie, one at the age of five from a painting, another at forty-five from a lithograph, and a third at eighty from a photograph. The series of Mr. Spurgeon's portraits is more complete, as the four examples given —at the age of twenty-one, thirty, thirty-six, and fifty-four—are all from photographs. Miss Terry's and Mr. Irving's portraits are also from photographs, and Mr. Irving's are noticeable because one of his photographs, taken when he was thirty years old, is not the least like him, save as to the hair, which appears to have taken about this time the peculiar wave with which we are all familiar. The concentrated look in the eyes and brows of Sir John Lubbock is repeated in each of the portraits given, and the extraordinary transformation which baldness and a beard have effected in Mr. Algernon Swinburne, who once had luxuriant locks and only a chin tuft, will surprise many.

Experiments in portraiture of this kind, even when conducted on a scientific basis, must be always more or less incomplete and disappointing. When a dozen portraits taken in as many minutes show a face in a different aspect in each, not much dependence can be placed on the trustworthiness of a series taken at intervals of a year or more. Perhaps more accurate knowledge of the changes wrought by time would be obtained by photographing the features separately. A series of photographs of the mouth, for instance, extending over half a century would be extremely curious. The habits, thoughts, and occupation in many cases strongly influence this feature, quite apart from the effects of time. No doubt, as the study of anthropology advances—for it is but in its infancy—something of this sort will be attempted.

Many of the most valuable photographic inventions in the way of apparatus have resulted from the crude efforts of amateurs to overcome special difficulties.

An instance of this is seen in the "handy" camera—an appliance which is largely used in America in connection with microscopic work. The camera was invented by Mr. H. Wangate, of Philadelphia, an ardent microscopist and a specialist, his studies being almost exclusively confined to the minute fungi belonging to the family of *myxogastres*. Though skilful with his pencil, his drawings of these minute organisms being equal to any yet produced, he found that the time demanded was a severe tax, and he determined to call in the assistance of photography.

There was, however, absolutely no camera in the market to meet his requirements. He proceeded to construct one. Procuring a plate-holder of the proper size, he built the camera to suit it, after the plan of the man who carried the bung-hole to a cooper to have a barrel made for it. His materials were some heavy, blackened cardboard and an old piece of a steam-engine fitting some four inches long; his tools, a pocket-knife and a glue-pot, with the brains to use them. With these crude appliances he produced a camera adapted to his microscope, and capable of doing the highest class of work. He uses a Zeiss $\frac{1}{18}$th homogeneous lens constantly, and frequently makes a dozen or more negatives of an evening. Mr. W. H. Walmesley, who recently read a paper on the subject at Detroit, upon seeing the apparatus, was struck with the conviction that, if it could be produced in a form adaptable to any microscope, it would supply an instrument long needed. The result was the "handy" camera.

An improved photographic illusion will shortly be exhibited in a play to be produced at one of Mr. Beerbohm Tree's matinées at the Haymarket. The illusion is the invention of Mr. Van der Weyde, and takes the form of a piece of statuary which has all the appearance of solidity, and yet is nothing but photography. At a recent private view in his studio, he says, two Royal Academicians were so completely deceived that "they literally turned and went away in a rage, so deeply did they resent the artistic illusion." The example already produced and exhibited in America is pronounced by Dr. Talmage to be the first statue he had ever seen which gave the idea of the human hair, and one man made quite a heavy bet that he could put his arms round it; it is needless to say he lost his wager. The production of this photographic curiosity may be looked for with interest.

The instantaneous camera is now an indispensable portion of the traveller's outfit. All who make a tour of the world are bound to bring home photographic mementos of their visits to places of celebrity, or they will not be thought much of by their friends. The Americans, in their business-like way, are the most energetic of tourists. Their usual way of making sure of seeing everything is to prepare a list in their note-books of things and places to be visited, and of ticking off each one as soon as it is inspected. As to lingering over any object of historic interest, it is not to be thought of. The thing is to get the list through, and to make sure that nothing has been omitted. Some indolent tourists have been known to tick off their lists without taking the trouble to look for themselves. Perhaps this is the wisest plan, because it must save the innumerable headaches which the unbroken inspection of churches and galleries is bound to create. But with the instantaneous camera in fashion, the lazy persons run a great risk of being shown up. We should not be surprised to hear that unless the American tourist brings back a series of pictures of things he has seen, he will be looked upon as something of a fraud.

The realistic writer will approve of a gigantic task which an enthusiastic admirer of Flaubert, a certain Count Premuli, has set himself. It is nothing less than an attempt to illustrate that singular book, "Madame Bovary," the forerunner of Zola's materialistic work, by means of instantaneous photographs. One can remember to have met on the street corners the typical personages that have been put into books by the great novelists. Who has not found himself face to face twenty times with Homais, Rodolphi, Emma Bovary? In this case the Count Premuli goes out with his *detective* in his pocket and, bang! he takes a photograph on the sly. Moreover, he does not wait for chance to put these personages in his path, he pursues them—his apparatus levelled upon his unconscious victims. Prevented from taking his subjects into his confidence and asking them simply to pose in certain attitudes, the Count estimates that it will require a dozen years and the aid of a fortune to finish the project. No doubt Count Premuli will derive infinite pleasure from his experience, but from the point of view of the outside world, one is tempted to ask if the game is worth the candle.

The writer in the *Globe* who speaks of the difficulty of finding in the British Museum portraits of contemporary writers who are "looking up," can surely have had no practical experience of this kind of thing. When the portrait of a newly born celebrity, be he a contemporary writer, actor, or artist, is wanted, the last place the editor of a paper, or anybody else who has had a training in this particular direction, would think of going to would be the British Museum. The *Globe* writer says: "Often it is very puzzling to find any picture of a man who is looking up, and the catalogues at the Museum afford no guidance on the point." Of course they do not. Why should they? Unless the catalogues possess the gifts of prophecy and second sight, how on earth are they to tell who is "looking up"? The experienced editor has a very simple method of getting over this seeming difficulty. He finds out the address of the budding celebrity, and asks him for his photograph. It is seldom refused.

NEWSPAPER PICTURES.

THE illustration of newspapers is a new branch of art. Ever since its beginning its apprentices have been trying to find out the simplest and most effective methods for the reproduction of drawings, in order that they might be made with the greatest possible quickness, engraved on metal with the utmost attainable celerity, and printed clearly and well at the rate of twenty thousand copies per hour. To such perfection have the processes for this purpose been brought, that the turning out of pictures all ready for the lightning presses is nowadays a matter of a very short time.

Most interesting of the processes employed in newspaper illustration, from the point of view of simplicity, is what may be termed the "chalk method." Take a thin bed of smooth chalk laid upon a metal surface, and draw upon it with a fine steel point any picture you may desire. The steel point will cut the lines of the picture out of the chalk to the metal, and thus you will have it in the shape of an intaglio. Make a stereotype from this intaglio, and you have your metal plate to print the picture from. Could anything be more simple?

Drawing on a Bed of Chalk.—Such is the idea of the chalk process. In applying it, instead of pure chalk various mixtures are used, such as plaster-of-Paris, with a certain proportion of a white Carolina clay. The stuff, pulverised and stirred up with water, is spread over a rectangular sheet of polished steel, as you would spread a slice of bread with butter, to an even thickness of about one thirty-second of an inch. Now you are ready to begin operations as soon as you have baked the steel plate in an oven for a while, until the layer has been rendered perfectly hard.

It will hardly do for you to attempt to draw your picture directly upon the chalk, lest you make mistakes. The best way is to make your sketch on a piece of paper, and then, laying it down upon the chalk surface, go over the lines with a pencil point, which will indent the paper, and leave marks beneath upon the chalk. Lift the drawing, and you find under it, in the chalk, its reproduction. Now you apply your steel point directly to the chalk, cutting all the lines of the drawing down through the chalk to the surface of the steel plate. When you finish this operation the dark steel of the plate shows through the chalk in all the lines of the sketch; and these lines are perfectly clean and sharp, thanks to the keenness of the knife-like steel point employed. All you have to do for the rest is to pour molten lead over the chalk surface in a mould, and let it get cold. The lines that are cut out of chalk will be reproduced in relief upon the lead, and thus you will have your metal engraving to print the newspaper picture from, mounting it for the purpose on an iron block thick enough to make it level with the type.

Zinc Etching.—Though so advantageous for its simplicity, the chalk method is not so good for fine work in the way of sketches and portraits as the "zinc process," so-called, which *The Washington Star* employs for its pictures. The former, however, by reason of its cheapness, is most useful to provincial newspapers, which cannot afford the comparatively expensive photographic plant required by the latter. In the zinc process, to begin with, an ordinary photograph reduced to the required size is taken with a camera of the pen-and-ink sketch drawn on cardboard by the artist. Next a smooth plate of zinc is "flowed over" with an albumen and bichromate solution, forming a skin on the surface; the glass negative of the picture is laid upon this zinc plate, and the two are put together in the sunlight. What are to be the black lines of the printed drawing are, of course, white and transparent in the negative. The sunlight goes through wherever the negative is transparent, and has the effect of hardening the sensitised skin beneath, so that it clings tightly to the zinc. It requires only one minute to perform this operation. Now the zinc plate is taken and given a coating over the sensitised skin of lithographers' ink, rubbed on with a roller, after which the plate is washed. In all places where the sunlight has not struck the zinc, owing to the opacity of the glass negative, the sensitised skin readily washes off together with the ink that covers it; elsewhere it clings. Thus, after the washing, the perfect drawing in ink remains upon the zinc plate. To make the ink lines harder the plate is brushed with powdered dragon's-blood. Then it is plunged into a bath of acid, which eats away the zinc wherever it is not protected by the ink, so that when it is taken out the lines of the drawing are found all raised above the rest of the surface of the plate, like a map for the blind, and when mounted "type high" on a metal base you have your "cut" ready to print from.

Such is the zinc process, by which the pictures in to-day's *Washington Star* were made. "Processes" have infinitely multiplied within the last few years—so much so, in fact, that the student of engraving is aghast at contemplating their variety. At present, however, the zinc method seems to be the most available for journals of the period. At all events, it is employed by a majority of the big newspapers of the country.

A Third Process, used for newspaper illustration, is photo-engraving, which somewhat resembles the zinc method. A glass plate, however, is used instead of a metal one. This glass plate is covered with a thin layer of sensitised gelatine, which is permitted to dry. Then the photographic glass negative of the drawing, made with the camera, just as in the other case, is laid over the gelatine, and the glass plate and negative, with the gelatine layer between them, are put in the sun for half an hour. The light hardens the gelatine, and makes it cling to the glass plate wherever it strikes through the negative, so that when the glass plate is subsequently put into water all the rest of the gelatine comes off, leaving the drawing on the glass in gelatine lines. Moist plaster-of-Paris is spread over the plate next, and permitted to harden; when it is taken off it is a mould of the drawing. From this mould a plaster "relief" is made, and a reproduction of metal in this relief by stereotyping is the plate to print with.

These are the three methods by which newspapers produce the pictures which go so far to brighten up and help out the interest of the columns of the daily press.—*Washington Star.*

PHOTOGRAPHS ON CELLULOID.—The following method has been invented and patented by Philip H. Mandel, Astoria, N. Y. It is a process of obtaining pictures on celluloid, which consists in treating the surface of the celluloid with acidulated gelatine and chrome alum, then transferring the picture from a tinted and sensitized and exposed photographic paper upon the prepared surface of the celluloid, next passing on the picture and removing the paper, then developing and fixing the picture on the surface of the celluloid, and protecting the picture by a layer of varnish.—*The Picture and Art Trade.*

IMPRESSIONISM IN PHOTOGRAPHY.*

BY GEORGE DAVISON.

In a very able and judicious report of the late Photographic Exhibition, the *Times* reviewer referred to the aim of the newer school of photographers to represent "the impression made on the artist's mind," and he said, "Here there are difficulties. The camera cannot select and discriminate. It cannot omit an ugly object or introduce a beautiful or suitable one. It cannot make those slight adjustments of the landscape which all painters do." Now this seems to suggest that the selection and discrimination is from something not in the particular scene in front of the artist. But the slight adjustments, the introduction of other objects, can be no part of the impression produced on the artist's mind by that particular scene. There is a supposition in this view of an insufficiency in nature, and a necessity for what I have referred to as Mr. Brett's "improvement and exaltation of natural images." Those who adopt this view must look for their beauty and interest in some conventional cleverness of brush work or in the fitness of the parts for telling a story, and not to the subtle truth of the picture. One may readily admit a beauty, an intellectual triumph in a composition, perfect in the fitness of its parts to tell a story or relate some historical incident, but this is a literary quality or it furnishes an antiquarian and didactic interest, and does not constitute the best, if at all the province, of pictorial art. The interest in such work and in symbolism is, as a rule, feeble and superficial for the nature student compared with the absorbing and exquisite pleasure derived from a bit of simple, natural beauty, faithfully and spiritedly painted. For example, what is the interest and pleasure derivable from a mythological or historical subject? According to a man's familiarity with the literature of mythology, according to the extent that his mind has been absorbed by that particular lore, so he appreciates such pictures. Their seeming accuracy may please him. That is classical scholarship being taught and fed by painting; it is not æsthetic pleasure. The same holds with regard to historical painting. The artist may imagine vividly what a suit of armour he has studied would have looked like upon a soldier of the fourteenth century upon a certain battlefield. He may hunt up all the incidents, and study all the customs and costumes of the time and the occasion, and his research may be very creditable, but, after all, what value or subtlety can there be in such work? It is not the province of art to teach or illustrate history, nor is it at its best with any didactic or moral aim. But even in historical pictures, mythological subjects, and the like, there may be something of the natural character, and this may captivate the æsthetic sense. There may be that in such work which, drawn from a study of nature, any and every observer can compare with his own experience. Whether it be figures or inanimate objects, all have gained some sense of their form, proportions, modelling, texture, and general appearance under many circumstances of light and atmosphere, and the chief charm lies in the life-like representation of these known appearances. The common criticism of the public in a gallery—"Oh, that's not natural; nothing like that was ever seen"—when quite unconventional, and not the product of hearsay, is generally the ultimate verdict upon such an imaginative picture, and coincides with the more completely cultivated and scholarly discrimination which discerns where and why the thing is not true. The naturalistic position, then, is that so far as a scene appeals to our experience of nature—harmonious and truthful in its light, atmosphere, relations, incident, and action—so far will it affect most powerfully our æsthetic sensibility, and such harmony and truth are only to be secured by a direct reference to nature.

Mr. Hamerton, in "The Graphic Arts," would make a distinction between truth and delight, but the naturalist, whether painter or observer, finds no opposition between the two, but derives the keenest of æsthetic pleasure from the faithfulness with which his own impressions of nature are expressed for him.

* Continued from page 990.

After all, nature is the best possible painter. Art has performed its highest function when it has enabled us to see "the eternal picture which nature paints in the streets, and has opened our "eyes to the masteries of eternal art." It teaches us to see the meaning, expression, and beauty—the poetry which lies in all natural phenomena, atmosphere and light, forms and actions. Emerson, in his essay on Art, says: "The best pictures can easily tell us their last secret. . . . . There is no statue like this living man, with his infinite advantage over all ideal sculpture, of perpetual variety. . . . . Men do not see nature to be beautiful, and they go to make a statue which shall be. . , . They reject life as prosaic, and create a death which they call poetic. . . . . They eat and drink that they may afterwards execute the ideal. Thus is art vilified; the name conveys to the mind its secondary and bad senses; it stands in the imagination as somewhat contrary to nature, and struck with death from the first."

Turning to the general contention that photography is merely mechanical, this cry may be answered by a reminder that so may brushwork be mechanical; and it is sufficiently answered, I think, by the fact that the work of various photographers is as distinctively individual as obtains in regard to painters. Even leaving figures out of the question, two photographers separately treating the same subject will produce two impressions almost, if not quite, as different in qualities as would two impressionist painters in monochrome. It may be said that the painter is freer to generalise, emphasise, and analyse, as he may please; but if this is said of an actual scene in front of the artist, it must be remembered that the lens, as used by a trained observer, sees very much as the eye sees; and that most of the suppression and selection possible to a painter genuinely consulting his impressions, is also at the command of the photographer. Unnatural emphasis may please a certain school, but it will not bear comparison with nature, and it will in time have its proper value assigned to it. It is also said that one photographer can easily proceed to take exactly the same picture that another has achieved. Well, I do not think it has ever been done yet in respect of any photograph worthy of the name of picture; and supposing it is so, cannot a painter copy the work of a fellow-artist? The mere fact of the means including more mechanism is not a disadvantage if the result be more truthful and life-like.

The *Times* reviewer finds difficulties—I am glad to notice that he does not say impossibilities—in the way of photography giving the impression produced upon the artist's mind. It may be advisable to look more closely into this. What is this selection and discrimination which is impossible to camera craft? What is it which is possible to the painter in monochrome, which is really an essential of good art, that is out of the power of the photographer? Leaving such vague references as "exaltation of natural images," can anything be definitely stated in respect of this rendering of impression; can the finger be placed distinctly upon any quality in handwork from nature—any power of the painter, excluding colour, which is absolutely out of the range of photographic possibility? Our impressions are made up of light and light values in relation to one another—colour, form, binocular vision effect, focus, perspective. The painter may not play with the tone or relative values of his subject and picture. He may not falsify what the eye sees in respect of focus and atmosphere, nor indulge in several points of sight. He cannot do much more than the photographer to express the relative interests of his subject, which must generally depend upon the point of focus of the eye. It will be said, "there is the power of emphasis." But how can the hand-worker, a genuine impressionist, emphasise what the photographer cannot! Does he gain anything by putting a little more gaudiness here, a little extra detail there, in the extreme distance beyond what the scene gives an impression of, as, for instance, in Mr. Brett's own pictures? Does he make his pictures stand out more plainly from their background than in nature, emphasising dark against light, or light against dark, to make the ignorant stare, as in some of the wood engravings in our illustrated journals? This is nothing more nor less than falsity of tone. In criticising Mr. Seymour Haden's famous "Agamemnon" etching, Mr. Ham-

erton asserts that "art is not the slave of nature," and on the ground of some greater purpose he defends what he calls the false tonal values of the plate. What this greater purpose was he does not state, but it is interesting to notice signs of some uncertainty in his opinion, for he almost immediately proceeds to show that, looked at from a certain distance, everything in the etching falls together into fairly truthful relation. If, then, it is admitted that emphasis by falsification of contrast or colour is not permissible, what is this discrimination which is so much insisted on? It would appear to be nothing more nor less than a seizing on those facts which most simply and directly give the spirit and character of a subject. The best of what is felt and thought to be "ideal beauty" is "abridgment and selection." This abridgment and selection is the broad treatment in painting, the effect that the eye sees, and the photographer has the means of seizing or subordinating the same facts by the power of focussing that he possesses over the lens. The *Times* reviewer says the camera "cannot omit an ugly object, or introduce a beautiful one, or make slight adjustments in the landscape." Well, as it is the question of impressions we are discussing, neither can the eye omit, or introduce, or adjust details. But it can go a few yards and find an affinity of delight where there are *no* ugly objects. And if the camera cannot cut out an ugly object the photographer can. Mr. H. P. Robinson does so, and makes *very considerable* adjustments of his landscapes; and Mr. Lake Price has contrived historical subjects not greatly inferior to much that passes in conventional art. Is it a figure that is to be introduced? Surely the photographer may select the best type. Is it a tree he wishes to change, a notice-board, or other incongruous object to remove? These are trifles when he has all nature before him, with infinite scenes and beauties that require no trimming of details. The hand-worker can, if he deems it right, omit and add freely, but the balance is redressed by the consideration that the one labours for a prolonged time at one subject, whilst the other may seek many fresh inspirations in the same time. Too much emphasis is put upon this small limitation, which is really an advantage in photography. It is *the light* that is the first and foremost fact of any scene or picture—the colour, the action, and sentiment of the figures. A severe naturalistic refuses to alter and omit, for, although so doing might introduce only small errors, a principle is involved. He feels that there is no occasion or excuse for it. He might make use of materials drawn from a variety of experiences—a cloud from this day, a figure from that field, a tree from yet another time and place; he might piece sketches together, sketches taken under altogether different circumstances of light and atmosphere, and each sketch might be delightful in itself; but, consisting as they must, of impressions utterly inharmonious, he would have done far better to have studied and expressed the beauty of each subject as it appealed to him complete in nature.

Mr. Brett proposes to exalt all natural appearances by drawing on memory, and foisting a recollection of one scene and object upon quite a different one. Surely he must see that the "choice and exquisite appearances of nature"—his own expression—are too good to be falsified by what is termed idealizing. Again, the perfection that Mr. Gale finds in Turner's "Storm" does not lie in any exaggeration of natural phenomena, nor in any impossible piecing together of the characteristics of one kind of storm with another. It has its effect because, and so far as, the impression made upon us by natural appearances is spiritedly reproduced. There is so much of this rare quality in much of Turner's work that keen pleasure is derived from it, in spite of some exaggerations and inaccuracies. Something less vague than claims for emphasis and the exaltation of natural images must be advanced before justification for painting from anything but nature can be admitted. The artist's work always falls short of his impressions received from nature. He has never given as fully as they impress him the pathos of human life, the radiance of the morning, the glory of the sunset. When he has achieved this, when he has succeeded in seizing for us one tithe of the splendour, the sweetness of nature, one single aspect and expression of the human face perfectly, as we ourselves know nature and life commonly, it will then be time to talk of improvement and exaltation of natural images, and to proceed to invent new combinations, which are to "surpass in delightfulness the real images."

(To be continued.)

TOMBSTONE PHOTOGRAPHY.

Several communications have lately appeared in our British exchanges on the above subject, as to the best means of overcoming the difficulties experienced in this branch of photography, notwithstanding how simple the process appears at first sight, or to those who have never tried it. One of the subjects mentioned in our British contemporary was a yellowish kind of granite, with the letters cut in and gilded. As there was little or no contrast between the stone and the gold, together with the inexperience of the photographer (probably an amateur), the plates resulted in failure, as the lettering did not show distinctly. Notwithstanding that orthochromatic and ordinary plates were tried in strong sunlight as well as dull light, the result was always the same. The advice given to overcome the difficulty was to make common whiting into a stiff paste with water, and then fill the letters in with a small palette knife; when dry, photograph. The result would be an excellent white inscription on a dark ground. Another correspondent, in a subsequent number, states that his plan is to take a small knob of whiting, place it in the palm of the right hand, and pass it over the line of letters to be filled, using considerable pressure—enough, in fact, to crush the whiting as it goes into every crevice of the letters. Then this wiseacre states that you have only to pass a cloth gently over the surface to remove any dust, and take the photograph. He then goes on to say that in case of white tombstones "dark chrome" should be substituted for whiting. So much for experimental theory. It is not necessary for us to state that the resulting negative would not be a photograph of the tombstone as it really is, but it would look like a flat surface the shape of the original, with coarse letters chalked upon it, and certainly not what it was the intention to portray.

The writer, who has probably had as much experience in this line of photography as any other person in this country, acknowledges that the subject is always a more or less difficult one if it is desired to obtain a legible inscription, no matter whether the stone is a fresh white marble, a cold grey granite, or an old crumbling memento of slate or soapstone, with its skull and cross-bones and "memento mori," weather-beaten and overgrown with moss and lichen. The same difficulties seem to exist to bother the amateur. We acknowledge that at first we had some failures in this special line; but we soon learned to set our camera a little to the side, according to the light, and not directly in front of the stone; result, a legible inscription all the time. This is accounted for by the fact that in sunken (V-shaped) letters one side is usually illuminated a little brighter than the other, except when the sun is directly in front or overhead. So we point the lens towards the brightest side of the sunken letters, and achieve our object where it would be almost impossible to get a good inscription if the camera were set up directly in front of these subjects.

In photographing old historic tombstones of discoloured marble, blue slate, grey soapstone, or reddish sandstone, when the inscription is almost illegible, we have frequently resorted to marking a line with our lead-pencil in the middle of the furrow of the sunken letter. Even where the stone was disintegrating and covered with lichens, the single pencil-mark seemed to bring out the whole contour of the letters, and thus save the inscription. This plan has the further advantage that it would be permitted in almost all cases, where such a proceeding as advised in our British exchange would not be tolerated for a moment.—J. F. S., in *The American Journal of Photography.*

A lady who had her photograph taken was showing it to her husband. "Do you think it looks like me?" she asked. "Yes," he said, after a critical examination, "it looks like you, only it seems very quiet."—*American Druggist.*

HOW TO BUILD UP A BUSINESS.*

IN these days nothing excites the average photographer so much as the prospect of obtaining some "'cute idea" or other, some new attraction, by which he may draw a novelty-loving public to his doors. It has been my fortune to have been trained in a studio, and to have had the management of a studio, whose hallways and reception-rooms, hung round with specimens of photographic work, were amongst *the* attractions of the cities wherein they were situated. If country people came to town they did not leave without seeing So-and-so's windows; the few artists of these cities made the study of So-and-so's photographs an incident in their daily walks; and the newspapers thought it their duty to keep their readers informed as to the latest additions to So-and-so's open exhibition of art photographs. And all this apparently concerted excitement was purely spontaneous; the artist-owner of these galleries was courteous to all who met him, but sought favours of none. The people flocked to view his windows because they appreciated the efforts there shown for their edification: his photographs were spoken of in the local art-schools because they were deemed meritorious subjects, full of suggestions to the art students; the press noticed them because it is one of the functions of the press to express public opinion, and in this matter public interest had been aroused, and public opinion was thereupon formed which had to have recognition. Of course, there was money in this idea—if idea it may be called—and not money only, but success and prosperity for the originator, and it was, moreover, something which contributed to the public good. I cannot but think that, if the same means by which success was attained in the case spoken of were followed here and now, the same success, at least in some measure, would follow here also. You shall know all about it in time; the methods employed are not secret; they were not patented, and you need not pay me twenty-five dollars for the process; I will give it to you free. But in giving it thus gratis, I know of a certainty that you will laugh it to scorn. The "pure cussedness" of the ordinary photographer points no other way; but I will give it to you, and you can do with it as you will.

The man of whom I tell you travelled the ordinary road to success. There is no royal or easy road, no short cuts. He who sets out for success with an eternal "Excelsior" in his heart day by day, will surely find it. This photographer realized in the beginning that success must eventually follow earnest, intelligent striving and endeavour. It has been so at all times and in all places. For long years he gave his attention entirely to his art (with him it was an Art, spelt with a big A), spending the days in his work-rooms, mastering one detail after another, and the nights were spent in reading and the cultivation of an artistic mind; and so he became expert in practice, and familiar with the theoretical principles underlying his daily work. In his self-culture optics and chemistry found their place, the study of art, in books and things apart from books, was his recreation, and history, general information, and humorous stories were gathered at odd moments for the amusement and recreation of his patrons, with many other studies. It was his belief that to be an artist in photography was sufficient reward for a life's endeavour, and so for thirty odd years we find him, ever devoted to his life's work, attaining the well-merited success he sought, and enjoying the respect and esteem of his fellow-citizens. He is working quietly there in the old town yet, with an ever-changing stream of young men and women all around him, eager to learn the science from him who has made himself master of it. I can see him yet—now telling a lady sitter of the vicissitudes of the epoch of Venetian art out of which was evolved the original prize of which an accessory near is a reproduction; now explaining to a pupil some law in optics; or giving labour-saving hints to his dark-room assistant; or sitting with all the boys around telling of the difficulties of the early days of the art; always humble and eager to learn, reading his photographic papers as religiously as ever, and discussing some controversy with us to make sure that we did not neglect them. I remember the pleasure people said it gave them to go about his house, and what a privilege we felt it to live and work there, filled as the place was with books, art-treasures, paintings, and restful furnishings. The spirit of the man permeated the house, and as you passed from room to room you felt the hard, matter-of-fact life of the world become more and more distant as your stay became longer. But why do I tell you all this, you ask? Because it has to do with the success he attained, and which we all want to reach in time. That artist opened his mind to receive every good idea or suggestion—he was positively greedy for helpful ideas either in technique or art; at first a farm-hand, then a gardener, he entered photography, beginning with a wooden shanty; and by reading, observation, and work he has elevated himself and his art, and, what may seem to some more important, has secured for himself that temporal prosperity which men look for when age comes on.

At some future time I may tell you other details of this successful career, but I content myself now with an explanation of one reason why the work of this photographer attained such popularity. It was full of endless variation, always progressive, and the best, moreover, he could produce. These characteristics were evident in the work itself. In addition to the careful study of chemistry and the teachings of art, this artist used to buy almost every illustration he could lay hands upon (within moderation, of course). Of illustrated books, magazines, periodicals, papers, drawings, pictures of statuary, collections of photographs, and engravings he possessed a great number, which was always being added to. I have seen him look into every book on a news-stand, and come away with an armful of periodical literature, as though he had struck a "Bonanza;" and afterward it was his delight to criticise the illustrations he had bought, and show us youngsters the suggestions and ideas which could be gathered therein for future help in portrait studies, *genre* pictures, and the arranging of groups. Afterward the most suggestive of these cuts were pasted in large albums for reference, and we found them immensely useful to train the young pupils just beginning studio work. Not that we tolerated imitation, but we used to analyze the pictures and get the detail of their superstructures, and their usefulness is beyond words. Amongst the most useful books were those issued by the Royal Academy and Metropolitan Art Galleries; these, being filled with reproductions of the works of trained artists, were the most valuable helps we could get, excepting always the study of the great masters. In our study of these latter an old edition of Burnet's *Essays* was esteemed greatly, because of the numerous and fine illustrations given therein at every turn.

* From *Wilson's Photographic Magazine*.

Here there is one suggestion for the photographer: You are too conservative—you do not keep pace with the possibilities of your art. Arouse yourselves; the field is still open; there never was more room in photography for earnest, sincere workers than there is now. Photography is not dead—its life has hardly begun, and it has a future before it surpassing any of its sister arts and sciences. A few years' careful work and intelligent striving, and the "Cheap John" question, which now worries you, and all such matters, will be relegated to their proper place—obscurity. The solution of these questions lies with the individual photographer, not with associations. The photographer who will give his mind wholly to his profession, seeking always excellence in work, and the proper catering to his clients, without doubt will receive due appreciation. Public opinion, in the main, is just, and gives to men their due; if your work deserves praise, sooner or later it will be given you. If, by the constant study of good photographic literature, by storing up ideas from all created forms of art, whether set forth by nature or in books, and by the careful observation of the endless variations and forms of human life around, you individualize your ordinary work, and make it interesting and attractive, as well as thoroughly good, there is nothing more absolutely certain than that success—temporal and otherwise—will eventually reach you in a greater measure than you ever dreamed of; but this can only be attained by long-continued, patient, intelligent effort.

PICTURES BY THE NICKEL-IN-THE-SLOT CAMERA.

ONE of the most startling and unique exhibits at the American Institute Fair is the drop-a-nickel-in-the-slot-and-have-your-picture-taken machine. It is surrounded at all hours by a throng, and as many as four hundred pictures, at five cents each, have been taken in a single day by this automatic machine. It promises to be a perfect Bonanza to its inventors. There are only two of these machines in operation at the present time, one in this city and the other in Minneapolis, Minn. This is the way the pictures are taken:—The subject is seated in a revolving metal chair seat, such as is used on a fire-engine, facing a hole in a wooden cabinet. The pretty young girl in charge tells you to look in the hole without winking. She then takes hold of a crank affixed to the machine, and gives it a single twist; it is as if she were trying to hoist a bucket of water from a well. A steel finger, visible from the outside of the machine, reaches forward and ignites a flash-light in what resembles the inside of a soup-bowl. There is a blinding flash, and presto-iseto! Your picture is taken. It requires just four minutes for the picture to be taken by the machine. By some mysterious internal contrivance the picture is developed and thrown out in a little metal case, ready to be displayed on the parlour mantel or in the family album. The results achieved by this remarkable machine are not always entirely satisfactory to the man who has invested his nickel. The pictures are apt to be slightly indistinct, so that, perhaps, it would be as well to provide yourself with a microscope before patronising the machine, in order to see whether it is your picture or not.

JUDGE DUFFY'S DISAPPOINTMENT.

Judge Duffy tried it the other day. The result was anything but satisfactory. The Judge remarked, as he carefully put his picture in his vest pocket, that his mustache looked as if it had been browsed upon by a Harlem goat. He noticed that his eyebrows, too, were missing, and did not know positively whether they had been singed off by the flash-light or burned up by the hot flush of indignation which suffused his face when the young lady operator asked him if he were a married man. It is reported that the Judge was very indignant at the result, and wanted his nickel back. His request, it is said, the young lady could not comply with, because the coin had been dropped in the slot, and had hidden itself somewhere in the internal economy of the machine.

CORONER MESSEMER LOSES HIS WHISKERS.

Coroner E. J. B. Messemer also dropped a nickel in the slot, with a most astonishing result. The picture came out as pallid as the bust of Pallas. His glorious yellow whiskers did not show up with the halo-like beauty with which they appear on the streets. The operator explained that if the Coroner had dyed his whiskers, those golden ornaments would have probably shown up better in the picture. As it was, she said, the machine had an instinctive repugnance to yellow; besides, what could he expect for a nickel? Did he want a cabinet photograph, beautifully coloured, and reposing on a rustic easel, for five cents? The Coroner meekly replied that he only wanted to see himself as others saw him. To this the young lady said that he ought to look in the glass. He then went to hear the automatic piano across the aisle, leaving Congressman Amos J. Cummings to be operated on.

AMOS CUMMINGS BEFORE THE CAMERA.

The Congressman dropped a nickel with a hole in it into the slot. There was a loud clicking of wheels inside the cabinet, as if the machine resented the imposition, and when the flash-light burst on his startled vision the Congressman winked like a toad in a shower. This accounts for the fact that his eyes are closed in the picture. As he held it up to the light Mr. Cummings said the photograph reminded him forcibly of how the Poet Geoghegan looked just after finishing his celebrated poem on "The Moonlight on Melrose Abbey."

ABE HUMMEL'S HIGH FOREHEAD.

Perhaps the happiest effect yet produced by the nickel-in-the-slot picture gallery is that of Abraham Hummel's lofty brow. The brow, it will be observed, extends over the crown of the legal head to the top of the spinal column. As he gazed upon the faint traces of his familiar lineaments Mr. Hummel was heard to remark that he wished there was a nickel-in-the-slot hair restorative machine in the building. He also whispered audibly that if in his dotage he should be weak enough to commit a crime, he fervently hoped that his picture in the Rogues' Gallery might be taken by the nickel-in-the-slot machine, for then not even his mother-in-law would recognize him.—*The Eye, Chicago.*

EUGENE DELACROIX.—In Paris, a magnificent monument has been erected in the Gardens of the Luxembourg to the famous French painter, Eugene Delacroix. Almost with his last breath, the creator of the French School of Romanticism in art dictated a codicil to his will, in which he expressed his desire to be buried on a certain hilly slope in the cemetry of Pere La Chaise, comparatively secluded from the crowd of celebrated sepulchres, and he explicitly gave instruction that no statue of himself was to be raised over his grave. His instructions have been respected, and the tomb in Pere La Chaise is yet unadorned by any effigy in marble or bronze of the great painter.

TIME AND INTENSITY OF LIGHT.—It requires courage to disagree with such a universally received authority on matters photographic as Captain Abney, but we muster enough for the purpose, for once. At a recent meeting of the London Camera Club, he is reported as having said, or "laid down the dictum," that *time and intensity of light were equivalent and interchangeable.* We do not know by what experiments and reasoning he supported his views; but we do know that in certain operations, at least, the theory is opposed by facts. For example, we have proved again and again, and the observation has been made by many independent operators, that if two pieces of bromide paper be exposed under the same negative, the one at, say, a distance of one foot from the source of light, for five seconds, and the other at a distance of two feet for twenty seconds, the longer exposure to the light of weaker intensity will yield a print of a richer and more velvety black than can be produced on the shorter exposure to a higher intensity, notwithstanding the fact that, if Captain Abney's contention were correct, they should be absolutely alike.—*The Beacon.*

ASTRONOMICAL TELESCOPES.*

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

I now show you a picture of this part of the diagram, inclosing the portions I wish to speak about, magnified ten times, so that you can see that about twenty-eight of our points, and, by supposition, twenty-eight of our particles of silver on the photographic plate, make up the picture. You will see that these dots vary in size. The difference is due to the amount of light falling within what we may call the sphere of action of each point, and should represent it exactly. The result can hardly be called a picture, as it conveys no impression of continuity of form to the mind. We have got down to the structure or separate parts, and to the limit of the powers of the eye and the photographic plate, of course on the assumption we have made as to the size of the points in the one case, and the particles of silver in the other. I will now show you the same parts of the moon as represented by the circles on our diagram exactly as delineated by photography. You now see a beautiful picture giving mountains, valleys, craters, peaks, and plains, and all that makes up a picture of lunar scenery. We have thus seen how the power of the eye is increased by the enlargement of the picture on the retina by the telescope, and also how, by increasing the size of the photograph, we also get more and more detail in the picture.

We know we cannot alter the number of those separate points on the retina which determine the limit of our powers of vision in one direction, but we may be able to increase enormously the number of particles of silver in our photographic picture by processes that will give finer deposits, and so, in conjunction with more perfect and larger photographic lenses, we may reasonably look for a great improvement in our sense of vision—it may be even beyond that given by the telescope alone; although it always will be something in favour of the telescope that the magnification obtained in the eye is about fifteen times greater than that obtained by photography when the image on the retina is pitted against the photograph of the same size, unless we use a lens to magnify the photograph of the same focal length as the eye, in which case it is equal. But we *may* go much further in our magnification of the photographic image. In other ways there is great promise when we consider the difference in the action of the eye and the chemical action in the sensitive film under the action of light. The eye cannot perceive objects that are not sufficiently illuminated, though this same amount of illumination will, by its cumulative effect, make a photographic picture, so that there are ways in which the photographic method of seeing celestial bodies can be possibly made superior to the direct method of looking with a telescope.

With some celestial objects this has been already done. Stars too faint to be seen have been photographed, and nebulæ that cannot be seen have also been photographed; but much more than this is possible. We may be able to obtain photographs of the surface of the moon similar to those I have shown, but on a very much larger scale, and we may obtain pictures of the planets that will far surpass the pictures we would see by the telescope alone.

I have mentioned that the distance at which the normal eye can best see things is about nine inches, as that gives the greatest angular size to the object, while retaining a sharp picture on the retina; but, as many of us know, eyes differ in this power. Two of the common infirmities of the eyes are long or short-sightedness, due to the pictures being formed behind the retina, in the first case, and in front of it in the other. Towards the end of the thirteenth century, it was found that convex lenses would cure the first infirmity, and, soon afterwards, that concave lenses would cure the second, as can be easily seen from what I have said about the action of these lenses; so that during the fifteenth and sixteenth centuries the materials for the making of a telescope existed; in fact, in the sixteenth century Porta invented the camera obscura, which is, in one sense, a telescope. It seems very strange that the properties of a convex and concave lens, when properly arranged, were not known much earlier than 1608. Most probably, if we may judge from the references made by some earlier writers, this knowledge existed, but was not properly appreciated by them.

Undoubtedly, after the first telescopes were made in Holland in 1608, the value of this unique instrument was fully appreciated, and the news spread rapidly, for we find that in the next year "Galileo had been appointed lecturer at Padua for life, on account of a perspective like the one which was sent from Flanders to Cardinal Borghese." As far as can be ascertained, Galileo heard of the telescope as an instrument by which distant objects appeared nearer and larger, and that he, with this knowledge only, reinvented it. The Galilean telescope is practically, though not theoretically, the simplest form. It is made of a convex lens in combination with a concave lens to intercept the cone of rays before they come to a focus, and render them parallel so that they can be utilised by the eye. It presents objects as they appear, and the picture has less colour in this form than in the other, where a convex eye-glass is used. It is used as one form of opera-glass at the present time. Made of one piece of glass in the shape of a cone, the base of which is ground convex, and the apex slightly truncated and ground concave, it becomes a single lens telescope that can be looked upon just as an enlargement of the outer lens of the eye.

Galileo was undoubtedly the first to make an astronomical discovery with the telescope; his name is, and always will be, associated with the telescope on this account alone.

Very soon after the introduction of the Galilean telescope, the difficulties that arise from the coloured image produced by a single lens turned attention to the possibility of making a telescope by using the reflecting surface of a concave mirror instead of a lens. Newton, who had imperfectly investigated the decomposition of light produced by its refraction through a prism, was of opinion that the reflecting principle gave the greatest possibilities of increase of power. He invented, and was the first to make, a reflecting telescope on the system that is in use to the present day; thus the two forms of telescope—the refracting and reflecting—came into use within about sixty years of each other. It will be perhaps most convenient, in briefly running through the history of the telescope, that I should give what was done in each century.

(To be continued.)

* Continued from page 993.

MR. JULIUS F. SACHSE writes to us that he has seen some good heliochromic pictures by Mr. F. E. Ives, which the latter is about to bring under the notice of the Franklin Institute.

Patent Intelligence.

Specifications Published.

14,304. *September 10th*, 1889.—"New Azo-Colouring Matters." ARTHUR GEORGE GREEN and THOMAS ATKINSON LAWSON, Chemists to the firm of Brooke, Simpson, and Spiller, Ltd., of Atlas Works, Hackney Wick, Middlesex, Aniline Dye Manufacturers.

This invention relates to the preparation of azo-colours of various shades of yellow, orange, and red, most of which have a decided substantive affinity for cotton.

The inventors claim—

1. The preparation of azoxy- and azo-ortho-toluidine, by the alkaline reduction with sodium stannite of nitro-ortho-toluidine, in the manner described in the specification.

2. The preparation of colouring matters by diazotising either of the compounds azoxy- or azo-ortho-toluidine, when obtained as above described, and combining the tetrazo compound so obtained with the sulphonic acids of various phenols and amines, more especially with the para-sulphonic acid of alpha naphthol (corresponding to Piria's naphthionic acid).

3. The colouring matters prepared in the manner as set forth.

18,453. *November 19th*, 1889.—"Holder for Adjusting Lime-light Jets." HENRY STANIFORTH, 62, Fitzwilliam Street, Sheffield, Dentist.

For the raising and lowering, adjusting and centreing lime light jets in optical lanterns and the like, I construct a screw thread with appliances for the clamping of the jet holder on to a brass plate or stage, working horizontally upon guides at each side. Attached to the lower part of the screw thread is fixed a brass wheel with a corresponding screw thread, which is inserted into a slot below, so that, by revolving the wheel, the brass plate or stage holding the jet clamps is raised or lowered.

20,014. *December 12th*, 1889.—"Appliances for Polishing Glass." VICTOR MALEVEZ, of Courcelles, Belginm, Engineer.

My inveution refers to improvements in or connected with glass polishing apparatus, or appliances producing great useful effects while obtaining the same degree of power and care as hitherto.

According to my invention, a ring or frame is carried by a driving shaft, and is provided with a series of small movable polishers receiving motion from or carried by the said ring. These small polishers may be fixed to the said frame, but the important part of my inuvention consists in the mode of adaptation of the said small polishers on the frame in such manner that if desired they may be pivotted, so as to have a double action in addition to the circular movement which is given to them in common by the rotation of the frame, whereby they make a very effective travel by their individual motion about themselves.

These small polishers are applied to the frame by means of spindles passing through brackets, and into the collar of the polishers.

If it is desired to fix the position of the said polishers, a key or cotter is inserted through the collar of the polisher and spindle. It follows that the small polishers can be thus rendered fixed or movable at will.

82. *January 2nd*, 1890.—"Carriers for Supporting Magnesium Flash-Lamps." ROBERT SLINGSBY, 168, High Street, Lincoln, Photographic Artist.

This inveution relates to new or improved carriers for supporting magnesium flash-lamps used for the purpose of securing artistic dispositions of lighting for photographing in halls, theatres, rooms, apartments, or other enclosed spaces.

These new or improved carriers may be arranged horizontally or vertically. When arranged horizontally, the carrier consists of a support stretched across the hall, room, or other enclosed space where the photograph is to be taken, as near the ceiling as possible. To this support is connected, by a special device, a light framework sufficiently large to carry any required number of the usual magnesium flash-lamps, and suspended by pulleys, so that it can be raised or lowered at will to enable the lamps to be charged and lighted.

When the carrier is arranged vertically, it consists of an upright rod provided with a foot to enable it to stand on the floor. One or more arms are adapted to slide on the aforesaid upright rod, each such arm being adapted to carry one or more magnesium flash-lamps, and to be set in various directions in order to spread the area of illumination. These arms can be lowered on the aforesaid upright rod to enable the lamps to be charged and lit, and be then raised thereon to any required height.

The vertical carriers will be found sufficient in photographing ordinary apartments up to, say, 40 feet by 30 feet by 20 feet high: and in photographing groups and interiors of large apartments or spaces, they can be used in conjunction with the horizontally arranged carriers. These carriers may also support suitable reflectors to aid the lamps. They are intended to supply the photographer with facilities for using any number of magnesium flash-lamps he may consider requisite to illuminate any given subject, and for placing the lights so as to secure the best artistic effects.

1,203. *January 23rd*, 1890.—"Photographic Cameras." DAVID CARTER, 15, Gerrard Street, Warwick, Joiner.

This inuvention cannot well be described without the aid of diagrams.

1,388. *January 27th*, 1890.—"An Instrument for Calculating Photographic Exposures." ALFRED WATKINS, The Imperial Flour Mills, Hereford, Miller.

The inventor claims:—

1. An instrument for calculating photographic exposures, consisting of the combination of a set of movable circular slide rules, an actinometer, and a pendulum.

2. The use, in an instrument for calculating photographic exposures, of a set of circular movable slide rules so arranged with stops and pointers as to be mutually dependent upon each other.

3. An instrument for calculating photographic exposures combined and operating as described.

2,263. *February 12th*, 1890.—"Glazing and Roofing Buildings." WILLIAM HENRY HEYWOOD, The Horticultural Works, Colne Road, Huddersfield, Horticultural Engineer.

The object of my invention is to fix asbestos packing in suitable channels, so that the glass bears upon the packing, upon astragal, or iron, or other metallic bars or supports.

The glazing bar with the channels and cap combined are drawn in one piece and bent as required, the cap being preferably in a scroll form, so as to leave a space between the outer edge and the inner part bearing on the glass, this space forming an air chamber, and is designed to prevent capillary attraction.

The use of the packing makes a perfect dust-tight glazing; the glass resting upon a soft cushion prevents breakage and rattle by vibration.

The inner channel is available for conveying away any water which may collect under the cap.

8,160. *May 24th*, 1890.—"Photograph Burnishing Machine." JOHN PITT BAYLY, 18, Fulham Place, Paddington, London, Patent Agent (a communication from abroad by William Entrekin, of 4,384, Main Street, Manayunk, Philadelphia; Pennsylvania, U.S.A., Photographer).

This invention has for its object to provide a photograph burnishing machine having a burnishing tool which is capable of being shifted in a direction transversely to the action of the roll, and thus bring a new burnishing surface into action when required.

The machine comprises a fixed frame in the upper part of which the burnishing tool is secured, preferably in a groove. In the ends of the frame are pivoted midway their length, two side frames, in the upper ends of which is suitably journalled a roller, and the opposite ends of which are provided with locking bolts. These locking bolts engage suitable apertures in the ends of the fixed frame when the pivoted roll carrying frames

are swung over in such manuer as to bring the roll over the burnishing tool.

The bearings in which the roll is mounted are supported upon suitable springs, which tend to keep the roll elevated above the burnishing tool. These bearings have inclined upper faces, corresponding to inclined wedges, joined by a rod, and running in slots, in the ends of the fixed frame. One wedge is provided at its end with a threaded aperture, in which engages the screwed portion of a stem free to turn, but not free to move longitudinally in its fixed bearings. Two of these adjusting screws provided with hand-wheels may be provided if desired, and serve to adjust the pressure upou the photograph between the roll and the burnishing tool. By meaus of suitable set-screws carried by the fixed frame, and acting on the burnishing tool, it may be shifted in a transverse direction for the purpose hereinbefore set forth.

Correspondence.

THE CHRISTMAS HOLIDAYS.

Sir,—I hope you will be able to find room for just a line to notify that I shall close from Wednesday evening over Christmas to the Monday morning, and I hope my customers will not grudge this extra holiday to my assistants, who have had an unusually busy seasou with the moving, and the large increase in business. You may may be interested to know that I have found my electric lights a distinct success and advantage every way during this dull, dark weather. Jonathan Fallowfield.

Charing Cross Road, London, December 20th.

Proceedings of Societies.

The London and Provincial Photographic Association.

December 18th.—Mr. W. E. Debenham in the chair.

A question from the box was read: What qualities are most desirable in a lantern objective?

Mr. T. E. Freshwater said a lens that passed the most light, and gave the flattest field. With an oil lamp a short focus lens should be used, otherwise a large loss of light would result from the distance of the light from the condenser.

Mr. A. Cowan showed a uegative takeu with a flash-light. Four lamps had been used with a charge of one and a-half grains of magnesium powder, the light being diffused by sheets of tissue paper. The negative was quite free from the hard result characteristic of flash-light pictures, having all the appearance of being taken in theordinary way by solar light.

Mr. Pask asked if the intensity of light would be greater on a surface from a uaked light or by interposing a condeuser.

The Chairman said that greater illuminatiou would result by using the optical system of a lantern.

Mr. T. E. Freshwater remarked that a bull's-eye condensed more light than a compound condenser.

The Chairman, by the aid of diagrams on the blackboard, illustrated the amount of light that a good objective should pass.

Mr. J. S. Teape asked if the platiuum from an old developer could be recovered.

Mr. A. Haddon suggested exposing it to light, reducing the ferric salt to the ferrous state, which would reduce the platiuum to the metallic state.

A question from the box: Is $\cdot 008 \times \sqrt{d} =$ the correct diameter of a pinhole for producing best definition when d = distance between ground glass and pinhole?

The question was deferred to the next meeting.

The South London Photographic Society.

At the meetiug held on the 19th iust., Mr. F. W. Edwards in the ehair, three members were elected.

An interesting print of a group of members of the late South London Photographic Society was received from Mr. Atkins, of Bromley. It had been artistically framed by Mr. W. F. Slater,

The West London Photographic Society.

December 12th.—Lantern night.

Mr. W. A. Brown, chairman, referred to the forthcoming exhibition to be held on the 9th and 10th January, and earnestly requested the members to endeavour to make the exhibition a success by sending in pictures for competition. He also stated that the technical meeting, falling on Boxing Day, would be postponed until the 2nd January.

A discussion as to the best means of avoiding smoke from flash-lamps then took place; the employment of a smoke-trap, constructed of hoops of cane, over which calico was strained, was considered the best meaus of overcomiug the difficulty.

Slides by Messrs. Dixon, Varden, Selby, Sims, Wilson, Livingstone, Scanlan, Whiting, Horton, P. J. Martin, Dickins, Dresser, and others were then exhibited.

The Oxford Photographic Society.

At the meeting held ou December 16th, an exhibition was made of the Bostou (U.S.A.) Camera Club slides, "The White Mountains of New Hampshire." The President read the description sent with the slides, and Mr. Stanley Kent provided the lantern. There were one huudred and twenty-eight present. Many of the slides are particularly fiue, but photographs cauot well represent the grandeur of some of the immense scenes.

One member was elected.

The next meetiug will be held ou January 6th, and will be a technical exhibition of members' slides for members only.

The Derby Photographic Society.

The monthly meeting was held on Tuesday at Smith's Restaurant, Victoria Street, with Mr. Bertwin Cooper as chairman.

Mr. W. T. Tucker, of the Loughborough Society, gave a paper entitled "My experience with a Hand-Camera." The lecturer dwelt upon the advantage derived in the use of a hand-camera for obtaiuiug chance pictures, which would otherwise be missed by using large apparatus, and the pleasure gaiued on a tour by dispensing with weighty and larger cameras. He theu described his particular apparatus, and illustrated his remarks by handing round specimens of negatives and prints.

A large collection of Mr. Tucker's slides, appertaining to the lecture, were thrown on the screen by Mr. J. A. Cope.

The Bath Photographic Society.

A meeting was held at the Royal Literary and Scientific Institution on the 17th inst., Mr. W. Pumphrey in the chair.

The subject before the meeting was a demonstration of enlarging with Hume's cantilever apparatus. The Chairman undertook the demonstration, and in the course of his remarks said the tendency was uow towards taking photographs of small size, especially quarter-plate, and then increasing the size afterwards as required. The great advantage offered was that they did not require to carry about an apparatus in the field which need embracc anything larger than the quarter-plate. That size he considered exceedingly convenient, and one which, if an enlarged picture were required, would admit of its being done equally as well as a direct picture. The speaker explained that there were three distinct methods of enlarging. "The first, daylight," he continued, "could not avail to those whose photographic pursuits in the winter were restricted to evening work. When daylight is used for enlarging purposes, we must either suspend our camera in such a way as to obtain direct light from the sky, or fix it horizontally towards a window, and reflect, by means of a mirror or white cardboard fixed at an angle of 45°, rays of light which shall pass through a transparent or partially transparent medium and negative to the lens, and these rays will come to a focus beyond. At that point our screen is placed, upon which the sensitive paper rests. A condition of an enlarging apparatus is that the part supporting the objective and the casel upon which the paper is adjusted be movable, and the adjustment of distances between these two factors determines the degree of alteration in size of the reproductiou. The next method which may be mentioned is one in which the oxy-hydrogen lime-light is used. This is

the next most powerful to daylight. Then in order come the various combinations of hydro-carbons. Here in this apparatus of Hume's we have one of the latter in the form of a duplex paraffin lamp, in which one wick so acts upon the other as to produce a brilliant flame. It is claimed for the apparatus that it is concentric in every part, and theoretically perfect." The gas was then lowered, and an exposure of two minutes given to a negative. Upon development, however, it was found that a longer exposure would have been better. The lecturer then entered into the details of the apparatus, replied to several questions, and promised to treat the subject of enlarging farther at the next meeting on January 27th.

THE GLASGOW AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of the Glasgow and West of Scotland Amateur Photographic Association was held in the Rooms, 180, West Regent Street, on Monday, December 15th, Mr. ARCHD. WATSON, president, in the chair. A paper on "Intensification" was read by Mr. W. GOODWIN.

Fifteen new members were admitted, making an increase of fifty since October. The office-bearers for 1891 were nominated, and slides by members were shown by means of the lime-light lantern.

THE GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE opening popular meeting of the session of the Glasgow Photographic Association was held on the 11th inst. in the large hall of the Philosophical Society's Rooms, 207, Bath Street, with Mr. WILLIAM LANG, Jun., F.C.S., president, in the chair.

The lecturer for the evening was Mr. PAUL LANGE, President of the Liverpool Amateur Photographic Association, who described a tour in Norway, fully illustrated with views taken by himself and shown by means of the lime-light. Some fine cloud pictures and hoar-frost scenes were also shown on the screen, and were much appreciated by the large audience.

An interesting entertainment was brought to a close with a series of views of the Channel Fleet taken during their recent visit to the Mersey.

ROSA BONHEUR, the famous painter of "The Horse Fair," who is sixty-eight years of age, is said to be in feeble health. She has her studio in the forest of Fontainebleau. As an annex to her vast studio there is a large park enclosed by a forest for Italian buffaloes. She also possesses some lion cubs, and has her ordinary stable for horses and her fold of sheep and goats, besides models of carts, wheelbarrows, and ploughs.

SIZE FOR GOLD LEAF.—A decorator informs us that he uses a size for gold leaf which, if properly made, has no equal, whether the gilding be done on wood, glass, or metal. He claims it to be the "secret size" used by the best artists of London and Paris, and by the justly celebrated Japanese of London, who produce the finest work in gold decoration in their line to be found in the world's market. The formula is as follows:—Take one pound of good pure drying oil; put it in a metal pot with a cover; slowly add to this, after it has come almost to a boiling point, four ounces of pure powdered gum animi (not copal, which is sometimes confounded with it). Take the animi on the point of a palette knife and put it in cautiously little by little, allowing each supply time to dissolve, all the while stirring the mixture. Boil to the consistency of tar, and, while warm, strain through a piece of silk into a heated, wide-mouthed bottle, keep well corked, and, when required, thin with turpentine and mix thoroughly. If a little vermilion is ground with the size, it will show better what is being done in using it.—*The Decorator.*

RECEIVED.—From Ed. Liesegang, Dusseldorf, *Photographischer Almanach und Kalender fur* 1891. This annual maintains its excellent character, and is an enlargement upon its predecessor by forty-four pages. It contains, among other illustrations, a portrait, as frontispiece, of Franz Veress, of whom a biographical sketch is also given.

Answers to Correspondents.

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

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

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

LUX.—*The Solar Club Festival.* The portrait sketches accompanying our report on page 964 were rapidly executed by a talented friend of Mr. George Scamell. They represent, first, Mr. Fitzgerald, of the Savage Club, in the act of delivering a humorous recitation on the troubles of a dramatic manager conducting a rehearsal. The gentleman was, unfortunately, carrying his left arm in a sling. The other is Mr. H. C. Triuks, a Danish chemist of saccharine proclivities, member of the Solar Club, and now resident in London.

T. B. LEGH.—*Photo-Mechanical Processes.* We are sending you the address by post; meanwhile begin by reading up Mr. W. T. Wilkinson's book on "Photo-Engraving and Collotype," and also that by Erust Lietze, "Modern Heliographic Processes" (New York; Van Nostrand Company, 1888). The Cantor Lectures of 1878 are still procurable, for two shillings, by making application to the Secretary of the Society of Arts. Lastly, look up the reports of the Camera Club Conference in the NEWS of March last, when the subject came forward for discussion and demonstration as part of their proceedings.

J. EDWARDS (Brighton).—*Matt Varnish.* Messrs. Burton and Pringle give the following formula:—Gum sandarac, 90 grs.; gum mastic, 20 grs.; ether, 2 oz.; pure benzol, ½ to 1½ oz.; according to texture desired; the more benzol added the *finer* the matt surface obtained.

COL. WATERHOUSE.—*Photo-Engravings.* Accept our best thanks for the pair of photo-engravings duly to hand. They are excellent, the view of the bridge over the Hoogly especially so, being soft and delicate with fine atmospheric effect. The Botanic Garden, Calcutta, also makes a capital picture. We reciprocate your good wishes for a happy new year.

ZOSTROW.—*Artificial Leather.* Stamped and coloured vegetable parchment (blotting paper treated with a mixture of two parts of oil of vitriol, and one of water) might, we think, be employed; but we have no actual knowledge of the processes, which are scarcely photographic.

C. S.—*The Place of the Bromide in Developers.* Opinions vary, some authorities putting the bromide into the pyro solution, and others professing to mix it with the ammonia or alkali. The best plan is probably to have it ready in a separate form of concentrated solution, and then supply it from a dropping bottle at the moment of mixing the developer. Only in this way can its proportionate amount be modified according to the requirements of the case, and increased in the event of over-exposure. See Mr. Valentine Blanchard's statement and general recommendation reported on page 893 of the NEWS.

W. Y. D.—*Platinotypes and Sepia Prints.* The discrepancy in evidence as to the effect of hydrochloric acid may arise from two different kinds of prints being called by the same name. Take it for granted that if neither hydrochloric acid nor solution of mercury chloride discharge the photograph, it is a true platinotype. Many of the sepia prints, being only surface toned, will not go through this test.

G. D. (Paris) and T. B. answered by post. Other correspondents in our next.

A. D.—(Leven, Fife) is thanked for sending particulars, which have been passed to the gentlemen on whose behalf the enquiry was made.

RECEIVED.—A copy of Prof. A. H. Church's new work on "The Chemistry of Paints and Painting," Seeley and Company. Also Dr. J. J. Acworth's pamphlet on the "Comparative Absorption and Colour-Sensitiveness of Tinted Gelatino-Bromide Plates."